



The Good Mood Food Campaign
Substantiation for Horticultural Commodities Nutrition Claims Report
ST19037

Prepared for Hort Innovation
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Document control and Disclaimers

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Disclaimers:

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Introduction

A June 2020 Australian mental health survey of the first month of COVID-19 found mental health problems (including measures such as reduced optimism) were at least twice as prevalent as before the pandemic.¹

With so many Australians in lockdown having to cook for themselves, an opportunity arose to encourage Australians to eat more fruit, vegetables, nuts and mushrooms for their brain and mood boosting benefits.

A social marketing campaign involving TV ads and social media posts was developed called The Good Mood Food campaign.

Good Mood Food is a nutrition and health claim and requires substantiation to comply with the Australian New Zealand Food Standards Code and Competition and Consumer Act.

The following report provides this substantiation.

Each of the 70 horticultural commodities, from 37 levy paying Australian horticultural industries, has been assessed for its nutrient composition related to psychological, neurological and energy benefits. A brief desktop review for relevant research related to these brain functions for each commodity has also been undertaken. The results are summarised in this report.

The first page in each section is website copy and the remaining pages provide more comprehensive substantiation.

A more thorough explanation of the methodology can be found in Appendix 1.

Appendices 2-8 provide further evidence for the role of fruit, vegetables, nuts, mushrooms on brain health and psychological wellbeing. In addition to these mini desk top research reviews for these commodities, there are also desk top reviews for the impact of gardening, cooking and hydration on brain function and psychological wellbeing.

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¹ <https://www.mja.com.au/journal/2020/mental-health-people-australia-first-month-covid-19-restrictions-national-survey>



1. ALMOND A GOOD MOOD FOOD

WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Almonds excel in vitamin E which offers antioxidant protection.
- Feel uplifted with niacin. Almonds are niacin-rich.
- Get activated – almonds are rich in magnesium – essential for energy production.
- Almonds are a non-dairy source of calcium – for nerves, muscles and bones.
- Eating almonds steady's the nerves they contain potassium.
- Love the skin you're in – almonds contain fibre especially their skins and show prebiotic potential for healthy gut bacteria.

Campaign taglines:

- Eat on the Bright side. Naturally boost your mood with Australian/Aussie Almonds.

Almonds:

- ✓ Rich in vitamin E – antioxidant protection
- ✓ Rich in niacin – psychological wellbeing
- ✓ Rich in magnesium – energy production
- ✓ Source of manganese – energy production
- ✓ Source of calcium - steady nerves
- ✓ Contains potassium – nervous system
- ✓ Source of fibre – healthy gut bacteria
- ✓ Contains polyphenol – natural antioxidants

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Almond fun facts

- Almond trees are reliant on wild bees and honey bees for pollination — No bees, no almonds.
- Australia is the second largest producer of almonds in the world.
- The almonds we know and love are technically called sweet almonds.
- Almond skins are prebiotics for the probiotics (they're fibre food for gut bacteria).
- Almonds are a heart healthy food.¹
- Watching your waist? A handful of almonds a day helps control body weight.¹
- Snacking on almonds after sports is a tastier way to recover.
- Can't drink milk? Almonds are a non-dairy source of bone building calcium.
- How do you pronounce almonds – with or without the L? We say "Armonds" but... well... ToMAYto ToMARTo.
- Almonds originated in the Middle East and in traditional Persian Medicine almonds were used as one of three nuts (walnuts, hazelnuts) to treat memory loss and cognition.²

NUTRITION INFORMATION

Serving size: 30g (20 almonds raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Energy	716kJ	8%	2390kJ
Protein	5.9g	12%	19.7g
Total fat	15.2g	22%	50.5g
Saturated fat	1.1g	5%	3.8g
Monounsaturated fat	9.2g		30.7g
Polyunsaturated fat	3.8g		12.8g
Total Carbohydrates	1.6g	1%	5.4g
Sugars	1.6g	2%	5.2g
Dietary fibre	3.3g	11%	10.9g
Sodium	0mg	0%	0mg
Potassium	239mg		796mg
Niacin eq	2.5mg	25%	8.2mg
Vitamin E mg	9.4mg	94%	31.4mg
Calcium	80mg	10%	265mg
Magnesium	80mg	25%	266mg
Manganese	0.9mg	18%	3.0mg
Total polyphenols [^]	125mg GAE		418mg GAE

Source: Aust Food Comp Data or [^] USDA

*based on an average adult diet of 8700 kJ

GAE means Gallic Acid Equivalents

References for website:

- 1) Lee-Bravatti MA, Wang J, Avendano EE, King L, Johnson EJ, Raman G. Almond Consumption and Risk Factors for Cardiovascular Disease: A Systematic Review and Meta-analysis of Randomized Controlled Trials. *Adv Nutr*. 2019;10(6):1076-1088. doi:10.1093/advances/nmz043 <https://pubmed.ncbi.nlm.nih.gov/31243439/>
- 2) Gorji N, Moeini R, Memariani Z. Almond, hazelnut and walnut, three nuts for neuroprotection in Alzheimer's disease: A neuropharmacological review of their bioactive constituents. *Pharmacol Res*. 2018;129:115-127. doi:10.1016/j.phrs.2017.12.003. <https://pubmed.ncbi.nlm.nih.gov/29208493/>

NIP Nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>
 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR ALMOND

Individual consumer friendly nutrient content and permitted general level health claims:

- Almonds excel in vitamin E which offers antioxidant protection. A 30g handful provides 94% RDI.
- Feel uplifted with niacin. Almonds are niacin-rich with 25% RDI in a handful. Niacin is needed for psychological wellbeing.
- Get activated – almonds are rich in magnesium – an essential mineral for energy production. Just 30g gives 25% RDI.
- 20 almonds contain 18% of the RDI for manganese a mineral required for energy production.
- Almonds are a non-dairy source of calcium – for nerves, muscles and bones. A 30g serve provide 80mg or 10% of calcium's RDI.
- Eating almonds steady's the nerves they contain 239mg of potassium.
- Love the skin you're in – 30g of almonds contain 3g of fibre – their fibre-rich skins show prebiotic potential for healthy gut bacteria.
- A serve of almonds contains 125mg GAE of polyphenols - antioxidants to help protect cells from free radical damage.

*When eaten as part of a healthy varied diet.
 (This statement needs to appear at the bottom of each commodity webpage)

Subcategory NUT claim:

- Nuts: Happiness in a handful. A healthy, varied diet containing a variety of nuts such as almonds is good for brain function and psychological wellbeing – putting you in happy mood.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 30g (20 almonds raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Energy	716kJ	8%	2390kJ
Protein	5.9g	12%	19.7g
Total fat	15.2g	22%	50.5g
Saturated fat	1.1g	5%	3.8g
Monounsaturated fat	9.2g		30.7g
Polyunsaturated fat	3.8g		12.8g
Total Carbohydrates	1.6g	1%	5.4g
Sugars	1.6g	2%	5.2g
Dietary fibre	3.3g	11%	10.9g
Sodium	0mg	0%	0mg
Potassium	239mg		796mg
Niacin eq	2.5mg	25%	8.2mg
Vitamin E mg	9.4mg	94%	31.4mg
Calcium	80mg	10%	265mg
Magnesium	80mg	25%	266mg
Manganese	0.9mg	18%	3.0mg
Total polyphenols^	125mg GAE		418mg GAE

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ
 GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Traditional Persian medicine included almonds as one of three nuts (along with walnuts, hazelnuts) that were used to treat memory loss and cognition.² It's only now modern day science is catching up to what early Middle Eastern physicians already discovered.

If you're having a particularly hard day and the stress levels are through the roof, eat more nutritious foods. Snacking on two handfuls of dry roasted almonds a day (about 65g) instead of typical muffins was found to help the heart deal with mental stress.³ Almonds are a well-known heart healthy food they come loaded with healthy fats, fibre, vitamins and minerals, and antioxidants such as vitamin E and polyphenols¹ which may explain how they help manage body stresses too. And then there's the post lunch slump - that drop in concentration and performance after lunch. Eating almonds at lunch time can reduce the post-lunch dip in cognition and memory.⁴

Perhaps it's the almond skins – they're packed with fibre and antioxidants and a perfect food for gut bacteria to thrive.⁵ New research is linking a healthy gut microbiome with brain disorders such as depression.⁶

All this almond brain-boosting evidence is supported by research in animal models which show that almonds can increase the brain's energy levels, reduce oxidative stress and enhance memory function.⁷⁻¹⁰

So it may just be that all you need is a handful of almonds a day – the perfect pick me up to bust the blues and be happy.

Speaking of blue....think Mediterranean and it's all blue skies, blue ocean and all that gorgeous fresh food (ok and a little red wine too). The Mediterranean diet is one of the healthiest in the world and followed by people in one of the Blue Zone - countries where people can live to over 100 years of age. The largest Mediterranean diet study in the world – the Spanish PREDIMED study - followed around 7000 older people from 16 centres for nearly five years and measured a range of health outcomes. People in the study were divided into a reduced fat diet, a Mediterranean diet plus extra olive oil or a Mediterranean diet plus 30g nuts a day. The nuts eaten were almond, walnuts and hazelnuts. Fascinating research coming from the centres has found that nut eaters have improved cognition compared to the reduced fat diet¹¹ and a reduced risk of depression¹².

The PREDIMED Mediterranean diet with just under 7,500 participants assessed for nearly 5 years found those following a Mediterranean diet with a daily 30g of nuts (walnuts, almonds, hazelnuts) had a 22% reduced risk of depression compared to those following a reduced fat diet. When only those with type 2 diabetes were assessed (nearly half the group) they had a 30% reduced risk.¹²

PREDIMED also discovered that after three years the risk of low brain-derived neurotrophic factor (BDNF) – a neurotransmitter affecting mood - was reduced by 78% in those who consumed a Mediterranean diet with nuts compared to the reduced fat diet.¹³ Buoyant BDNF may help explain the positive effect of a Mediterranean diet including almonds on mood.

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NIP Nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>
 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Almond or *Prunus dulcis* and review and diet and [mood/ psychological/ wellbeing/ brain function/ cognition]

2. APPLE A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Life's rosy eating apples. Apples boost your vitality they are folate-rich to help fight fatigue.
- Feel all shiny eating apples. Apples add sparkle - they're vitamin C-rich - a natural mood booster.
- Life's rosy eating apples. Apples boost your vitality they provide natural fruit sugars for energy.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie Apples.

Apples:

- Rich in folate – fatigue fighter
- Rich in vitamin C – mood booster
- Contains natural fruit sugars - for energy
- Good source of gut-loving fibre
- Contains polyphenols especially the skin - natural antioxidants

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity page)

Apple fun facts

- Be an apple explorer– there's 15 different varieties grown in Australia – try 'em all.
- Store your apples in the fridge when you get home, they'll stay fresher and keep their crunch longer.
- Keep the skins on - a lot of the antioxidants and other good stuff is in the skin.¹
- Apples are low GI and an apple a day may just keep diabetes at bay.^{2,3}
- Apple fibre - good for gut health and gut microbiome.^{4,5}
- Apples are folate-rich which is vital during pregnancy.
- Spice up your apple dishes – try cinnamon, clove, nutmeg or mint.

NUTRITION INFORMATION

Serving size: 150g (1 medium apple unpeeled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	128g		85g
Energy	360kJ	4%	240kJ
Protein	0.5g	<1%	0.3g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	19.1g	6%	12.7g
Sugars	18g	20%	12g
Dietary fibre	4.1g	14%	2.7g
Sodium	1.5mg	<1%	1.0mg
Folate eq	88.5ug	44%	59ug
Vitamin C	10.5mg	26%	7mg
Total polyphenols^	375mg GAE		250mg GAE
Anthocyanins**	8mg		5.3mg
Quercetin#	20mg		13.2mg
Glycemic Index (GI) ^^	36 (low)		

Source: Aust Food Comp Data or ^USDA

*based on an average adult diet of 8700 kJ

**Wu X et al 2006 JAFC (average of 3)

#Boyer et al 2004

"<" means less than

GAE means Gallic Acid Equivalents

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- 1) Mendoza-Wilson AM, Castro-Arredondo SI, Espinosa-Plascencia A, et al. Chemical composition and antioxidant-prooxidant potential of a polyphenolic extract and a proanthocyanidin-rich fraction of apple skin. *Heliyon*. 2016;2(2):e00073. doi:10.1016/j.heliyon.2016.e00073. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4945893/>
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- 4) Koutsos A, Lima M, Conterno L, et al. Effects of Commercial Apple Varieties on Human Gut Microbiota Composition and Metabolic Output Using an In Vitro Colonic Model. *Nutrients*. 2017;9(6):533. doi:10.3390/nu9060533 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5490512/>

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NIP nutrient composition references:

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

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^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SUBSTANTIATION FOR APPLE

Individual consumer friendly nutrient content and permitted general level health claims:

- Apples are folate-rich - one apple provides 44% RDI (89ug). Folate is necessary for psychological wellbeing and helps reduce tiredness and fatigue.
- Just one apple provides a quarter of your daily vitamin C needs (11mg). The vitamin C in apples is good for mind, mood and an energy boost.
- Apple's fruit sugars are a natural energy source with 18g per apple.
- An apple is a good source of gut-loving fibre providing 14% of daily fibre needs or 4g of fibre.
- One apple contains 375mg GAE of polyphenol antioxidants which help cells overcome free radical damage.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as apples, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory FRUIT claim:

- Fruit are natural fatigue fighters – they're packed with energy boosting nutrients such as natural sugars for energy, and folate and vitamin C which boost mood and stop the brain drain.
- A healthy varied diet high in fruit such as apples is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 150g (1 medium apple unpeeled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	128g		85g
Energy	360kJ	4%	240kJ
Protein	0.5g	<1%	0.3g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	19.1g	6%	12.7g
Sugars	18g	20%	12g
Dietary fibre	4.1g	14%	2.7g
Sodium	1.5mg	<1%	1.0mg
Folate eq	88.5ug	44%	59ug
Vitamin C	10.5mg	26%	7mg
Total polyphenols^	375mg GAE		250mg GAE
Anthocyanins**	8mg		5.3mg
Quercetin#	20mg		13.2mg
Glycemic Index (GI) ^^	36 (low)		

Source: Aust Food Comp Data or ^USDA

*based on an average adult diet of 8700 kJ

**Wu X et al 2006 JAFC (average of 3)

#Boyer et al 2004

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and so not suitable for branded communications. Instead this information is for educational purposes only.

The brain's complex circuitry needs loads of nutrients to keep it running in tip top shape. Apples' folate and vitamin C are vital but research has found so are apples' antioxidants. These polyphenol antioxidants may benefit the brain by improving cognition and reducing anxiety.¹ This discovery is new and based on research in animal models and not us humans. After 10 weeks of aged rats eating fresh apple in their diets, the rats were less anxious when running through maze tests. Apples also restored synaptic brain function to the level of younger animals.² Eat apples and you may just start feeling young again.

Dark red and purple pigments signal the presence of anthocyanins in apples. Anthocyanins are phytochemicals that may have a protective effect on the brain by improving cognitive performance and memory.³ Quercetin another antioxidant in apples has similar effects^{4,5} although one study found no difference in cognition or mood with flavonoid rich apples⁶.

These brain benefits support what we already know that people eating a diet rich in fruit and vegetables have a better mood and increased happiness, life satisfaction, and psychological wellbeing.⁷⁻¹³

Apples have found to be one of the top 10 raw foods related to better mental health. Fruit and vegetable intake predicts a higher positive mood, life satisfaction, and flourishing.⁹

A large analysis of 61 different studies found a high intake of fruit and vegetables in adults promotes higher levels of optimism and self-efficacy – confidence in yourself that you can achieve what you set out to. These fruit and veg eaters also had less psychological distress and vagueness. It is clear fruit and vegetables have a positive influence on mental health so get munching you need at least 5 portions of fruit and vegetables a day.¹⁰

An Australian study assessing the food diaries of 12,385 Australian adults found if you ate higher intakes of fruit and vegetable you were more likely to be happier and have more life satisfaction and wellbeing. Just looking at those eating the highest amount of fruit and vegetables (8 portions a day) over a two year period - their increase in life satisfaction was equal to the mood boost you would get if moving from unemployment to employment.⁷

These fruitful benefits can also have a huge impact in young people. Young adults eating a loads of fruit and vegetables were more likely to have a greater “eudaemonic” wellbeing. You day what? Eudaemonic (pronounced you-day-mon-ic) is a state of “flourishing” – feeling engaged, having meaning, being curious and creative and having purpose in life). They also had more intense feelings of curiosity and greater creativity. On days they ate more fruit and vegetables they reported greater wellbeing, curiosity and creativity compared to days they ate less fruit and veg.¹¹ So to crunch and sip your way to great creativity at work and school - get into the fruit and veg.

Another study of young adults found on the days they consumed 7-8 serves of fruit and vegetables they were more likely to experience feelings of a positive mood - joy, interest, and alertness. This had a lasting effect too as the day afterward they still felt the same way.¹²

Eating vegetables and fruit such as apples can promote emotional wellbeing in healthy young adults and maintain cognitive function in older adults. With 15 apples varieties available to try there has never been a better reason to get crunching!

References for substantiation

- 1) Hyson DA. A comprehensive review of apples and apple components and their relationship to human health. *Adv Nutr.* 2011;2(5):408-420. doi:10.3945/an.111.000513 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3183591/pdf/408.pdf>
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NIP nutrient composition references:

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

**Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem.* 2006;54(11):4069-4075. doi:10.1021/jf060300I <https://pubmed.ncbi.nlm.nih.gov/16719536/>

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^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SEARCH TERMS USED FOR PUBMED: Apple or *Malus domestica* and diet and [mood/ psychological/ wellbeing/ brain]

3. APRICOT A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Put a pep in your step with a couple of apricots. Bursting with vitamin C for the ultimate mood booster!
- Feed your brain vitamin E containing apricots. Vitamin E - a natural antioxidant that protects body cells.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/Aussie apricots.

Apricots:

- ✓ Rich in vitamin C – mood booster
- ✓ Source of vitamin E – antioxidant protection
- ✓ Source of niacin – psychological wellbeing
- ✓ Source of fibre – good for the gut
- ✓ Contains potassium – nerve function
- ✓ Contains polyphenols – natural antioxidants
- ✓ Contains beta-carotene – antioxidant protection
- ✓ Contain natural fruit sugars - for energy
- ✓ Low Glycemic Index carbs – sustained energy

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Apricot fun facts:

- An apricot tree will produce fruit for about 20-25 years.
- The name apricot is thought to be derived from the Latin word for 'precious'.
- A couple of apricots are the perfect snack – tear open the juicy, fragrant fruit and pop into your mouth.
- Apricots contain beta-carotene. Beta-carotene gets converted to vitamin A in the body, an essential nutrient for good eye health.^{1,2}
- Keep your skin healthy and attractive with apricots. Packed with beta-carotene to help your skin glow from within.^{3,4}
- Keep your skin healthy. Vitamin C strengthens skin cells.⁵
- Vitamin C is a powerful antioxidant to support immunity.⁶ Now more than ever is the time to add apricots to your diet and stay healthy.

NUTRITION INFORMATION

Serving size: 150g (2 apricots unpeeled raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	128g		85g
Energy	266kJ	3%	171kJ
Protein	1.2g	2%	0.8g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	10.5g	3%	7g
Sugars	9.9g	11%	6.6g
Dietary fibre	3.8g	13%	2.5g
Sodium	3mg	<1%	2mg
Potassium	503mg		335mg
Niacin eq	2.1mg	21%	1.4mg
Vitamin C	18mg	45%	12mg
Vitamin E	1.8mg	18%	1.2mg
Total polyphenols^	119mg GAE		79mg GAE
Beta-carotene eq	546ug		364ug
Glycemic Index (GI)^	46 (low)		

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

- 1) Rasmussen HM, Johnson EJ. Nutrients for the aging eye. *Clin Interv Aging*. 2013;8:741-748. doi:10.2147/CIA.S45399. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3693724/>
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NIP nutrient composition database references

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<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SUBSTANTIATION FOR APRICOT

Individual consumer friendly nutrient content and permitted general level health claims:

- Put a pep in your step with a couple of apricots. You'll get almost half your daily vitamin C requirements, to help boost your mood.
- Just two apricots contains 18% of your daily vitamin E needs. Vitamin E is a natural antioxidant that protects body cells.
- Get more than 20% of your daily needs for niacin with one serve of apricots. Niacin supports positive psychological wellbeing.
- Apricots contain just over 500mg of potassium in one serve, which is needed for a healthy nervous system.
- Look no further than apricots for natural energy, they contain nearly 10g of fruit sugars in every serve.
- Did you know two apricots contain 119mg GAE of polyphenol antioxidants, which protect cells from free radical damage?
- Beta-carotene gives apricots its vibrant orange colour. It's also beneficial as a natural antioxidant to keep the cells in your body healthy.
- Apricots contain low Glycemic Index carbs to stop you getting hungry! (GI=46)
- Your gut will love apricots as a source of fibre, nearly 4g in two apricots to feed the good bacteria.

NUTRITION INFORMATION

Serving size: 150g (2 apricots unpeeled raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	128g		85g
Energy	266kJ	3%	171kJ
Protein	1.2g	2%	0.8g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	10.5g	3%	7g
Sugars	9.9g	11%	6.6g
Dietary fibre	3.8g	13%	2.5g
Sodium	3mg	<1%	2mg
Potassium	503mg		335mg
Niacin eq	2.1mg	21%	1.4mg
Vitamin C	18mg	45%	12mg
Vitamin E	1.8mg	18%	1.2mg
Total polyphenols^	119mg GAE		79mg GAE
Beta-carotene eq	546ug		364ug
Glycemic Index (GI)^^	46 (low)		

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory FRUIT claim:

- A healthy varied diet high in fruit such as apricots is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Apricots are lush. Who doesn't love biting into the soft velvety fresh and tasting the fresh tropical fruit notes. This favourite summerfruit may also improve your mood, as research has shown people who eat a lot of fruit are more likely to have greater life satisfaction and more positive moods.¹

Apricots are a go-to fruit when it comes to antioxidants. They contain antioxidant vitamins C and E, antioxidant pigment beta-carotene and antioxidant polyphenols - to protect your body cells such as brain cells from free radical damage. Fruit may also play a role in maintaining brain health.² There is emerging evidence that antioxidant-rich fruit like apricots, help to improve cognitive health by preventing or delaying the onset of cognitive decline during ageing.³

Orange coloured beta-carotene specifically has been linked to higher levels of optimism.⁴ What a great reason to eat apricots with their vibrant orange flesh – don't worry be happy. Enjoy a couple of apricots today and reap the good mood benefits! Apricots also contain polyphenols as well as a range of other positive nutrients like carbohydrate, fibre, vitamin C and potassium, which have all been shown to have a positive influence on mental health.

A review of 61 studies analysing the fruit and vegetable intake and mental health in adults found a high total intake of fruit and vegetables may promote higher levels of optimism and result in less psychological distress.⁵

In both adults and children, emerging evidence suggests increased fruit intake improves psychological wellbeing. This could be related to the fibre in fruit contributing to good gut health, happy gut bacteria and a healthy brain function.⁶

References for substantiation

- 1) Brookie KL, Best GI, Conner TS. Intake of Raw Fruits and Vegetables Is Associated With Better Mental Health Than Intake of Processed Fruits and Vegetables. *Front Psychol*. 2018; 9: 487. doi:10.3389/fpsyg.2018.00487 <https://pubmed.ncbi.nlm.nih.gov/29692750/>
- 2) Rajaram S, Jones J, Lee GJ. Plant-Based Dietary Patterns, Plant Foods, and Age-Related Cognitive Decline. *Adv Nutr*. 2019;10(Suppl_4):S422-S436. doi:10.1093/advances/nmz081 <https://pubmed.ncbi.nlm.nih.gov/31728502/>
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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SEARCH TERMS USED FOR PUBMED: Apricots and *Prunus armeniaca* and beta-carotene and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/depression]

4. APRICOT DRIED A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Sweeten your day naturally with dried apricot's low GI carbs.
- Ditch the coffee for dried apricots. They contain niacin to fight fatigue.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/Aussie dried apricots.

Dried apricots:

- ✓ Contains natural fruit sugars – for energy
- ✓ Source of fibre – gut health
- ✓ Source of niacin – fatigue fighter
- ✓ Contains potassium – steady nerves
- ✓ Contains polyphenols – fights free radicals
- ✓ Contains beta-carotene – antioxidant
- ✓ Low Glycemic Index carbs – long-lasting energy

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Dried apricot fun facts:

- It is a myth that dried fruits such as dried apricots are “sticky” and bad for dental health.¹
- Sun-dried apricots are brown in colour. The sunlight oxidises the apricot flesh, acting as a natural preservative.
- Egyptians use dried apricots to make a drink called amar al-din and now often consumed during Ramadan.
- Eating dried fruit such as apricots is associated with better nutrient intake, lower body weight and an overall high quality diet.²
- A few dried apricots paired with a handful of nuts is an easy fibre-rich and energy-boosting snack.

NUTRITION INFORMATION

Serving size: 30g (4 dried halves)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	9g		30g
Energy	266kJ	3%	886kJ
Protein	1.3g	3%	4.3g
Total fat	0.1g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	13.3g	4%	44.4g
Sugars	12.1g	13%	40.4g
Dietary fibre	2.5g	8%	8.4g
Sodium	11mg	<1%	37mg
Potassium	453mg		1510mg
Niacin eq	1.0mg	10%	3.2mg
Total polyphenols^	74mg GAE		248mg GAE
Beta-carotene eq	715ug		2382ug
Glycemic Index (GI) ^^	31 (low)		

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

References for website:

- 1 Sadler MJ, Gibson S, Whelan K, Ha MA, Lovegrove J, Higgs J. Dried fruit and public health - what does the evidence tell us?. *Int J Food Sci Nutr*. 2019;70(6):675-687. doi:10.1080/09637486.2019.1568398 <https://pubmed.ncbi.nlm.nih.gov/30810423/>
- 2 Keast DR, O'Neil CE, Jones JM. Dried fruit consumption is associated with improved diet quality and reduced obesity in US adults: National Health and Nutrition Examination Survey, 1999-2004. *Nutr Res*. 2011;31(6):460-467. doi:10.1016/j.nutres.2011.05.009 <https://pubmed.ncbi.nlm.nih.gov/21745628/>

NIP nutrient composition database references

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SUBSTANTIATION FOR APRICOT DRIED

Individual consumer friendly nutrient content and permitted general level health claims:

- Dried apricots are your go-to energy source. Just four dried halves provides 12g of fruit sugar energy to keep you going.
- Feed your gut bugs dried apricots and keep 'em happy. One 30g serve contains 8% of your daily fibre needs for a healthy gut microbiome.
- Feeling tired? Snack on a 30g serve of dried apricots for 10% of your daily niacin needs that helps to reduce fatigue.
- Potassium is a mineral required for steady nerves. Four dried apricots provides 453mg of potassium.
- Four dried apricots contain 74mg GAE of polyphenol antioxidants, which protects your body cells from free radical damage.
- Dried apricots often have a deep orange colour thanks to beta-carotene, an antioxidant that protects cells and supports good brain health.
- Need long lasting energy to keep you going? Add low Glycemic Index dried apricots (GI=31) to your daily diet for sustained energy.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as dried apricots is good for psychological wellbeing and good mood.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Dried apricots are a convenient snack that provides natural energy from sugar, fibre and a range of nutrients and antioxidants. They are a source of beta-carotene, which has been linked to greater levels of optimism¹, so pop a few in your mouth to feel happy!

Eating dried apricots could keep your brain healthy too. Research has found that fruit rich in antioxidants can help to improve cognitive health and may delay the natural ageing process of cognitive decline.^{2,3}

An Australian study that examined food diaries of over 12,000 participants, found that increased fruit and vegetable consumption was predictive of increased happiness, life satisfaction, and wellbeing.⁴ It's really easy to include four dried apricot halves in your daily snack and reap all these happy benefits.

NUTRITION INFORMATION

Serving size: 30g (4 dried halves)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	9g		30g
Energy	266kJ	3%	886kJ
Protein	1.3g	3%	4.3g
Total fat	0.1g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	13.3g	4%	44.4g
Sugars	12.1g	13%	40.4g
Dietary fibre	2.5g	8%	8.4g
Sodium	11mg	<1%	37mg
Potassium	453mg		1510mg
Niacin eq	1.0mg	10%	3.2mg
Total polyphenols^	74mg GAE		248mg GAE
Beta-carotene eq	715ug		2382ug
Glycemic Index (GI) ^^	31 (low)		

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Dried apricots are a favourite lunch box snack for children and emerging evidence suggests that increased fruit intake may improve psychological wellbeing in kids and young adults too. The Australian Victorian Child's Health and wellbeing study observed over 3,000 children and found those who ate higher daily fruit serves had significantly better odds of emotional control and problem management compared to those who ate less fruit.⁵ In a randomised control study of young adults who did not eat much fruit, it was found that adding just two daily serves of fruit led to significantly improved psychological wellbeing.⁶ So pack some dried apricot halves in your little and big kids' lunch boxes for a happy, healthy school day.

References for substantiation

- 1 Boehm JK, Williams DR, Rimm EB, Ryff C, Kubzansky LD. Association between optimism and serum antioxidants in the midlife in the United States study. *Psychosom Med*. 2013;75(1):2-10. doi:10.1097/PSY.0b013e31827c08a9 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3539819/>
- 2 Rajaram S, Jones J, Lee GJ. Plant-Based Dietary Patterns, Plant Foods, and Age-Related Cognitive Decline. *Adv Nutr*. 2019;10(Suppl_4):S422-S436. doi:10.1093/advances/nmz081 <https://pubmed.ncbi.nlm.nih.gov/31728502/>
- 3 Loefer M, Walach H. Fruit, vegetables and prevention of cognitive decline or dementia: a systematic review of cohort studies. *J Nutr Health Aging*. 2012;16(7):626-630. doi:10.1007/s12603-012-0097-x <https://pubmed.ncbi.nlm.nih.gov/22836704/>
- 4 Mujcic R, J Oswald A. Evolution of Wellbeing and Happiness After Increases in Consumption of Fruit and Vegetables. *Am J Public Health*. 2016;106(8):1504-1510. doi:10.2105/AJPH.2016.303260 <https://pubmed.ncbi.nlm.nih.gov/27400354/>
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- 6 Renzaho A.M.N, Kumanyika S, Tucker K.L. Family functioning, parental psychological distress, child behavioural problems, socio-economic disadvantage and fruit and vegetable consumption among 4-12-year-old Victorians, Australia. *Health Promot. Int*. 2010;26:263-275. <https://pubmed.ncbi.nlm.nih.gov/20713413/>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>
 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>
 ^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SEARCH TERMS USED FOR PUBMED: Dried apricots and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]



5. AVOCADO A GOOD MOOD FOOD

WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Avocados contain the B vitamin folate for mind and mood so you'll *avo better day*.
- Sharpen your mind! The pantothenic acid (vitamin B5) in avocados helps sharpen mental performance.
- Smash fatigue, live life! Avocados contain niacin to beat the brain drain and boost energy.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie Avocados.

Avocado:

- ✓ Source of folate – psychological wellbeing
- ✓ Source of pantothenic acid – mental performance
- ✓ Source of niacin – fights fatigue
- ✓ Source of fibre – happy gut
- ✓ Contains potassium – steady nerves
- ✓ Contains mostly unsaturated fats – healthy heart

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Avocado fun facts

- Did you know avocado is technically a fruit – a berry with a very large seed? We enjoy it in a similar way to vegetables. You might call it a 'fregetable'!
- The riper the avocado, the higher the antioxidant content proving the old saying 'things get better with time'.¹
- Avocado contains mostly healthy mono - and polyunsaturated fats which help maintain a healthy heart.²
- Sliced or smashed, avocados make everything better from breakfast (smashed avo on toast) to dinner (avo salad) and even dessert (avo choc mousse)!

References for website:

- 1 Bhuyan DJ, Alsherbiny MA, Perera S, et al. The Odyssey of Bioactive Compounds in Avocado (*Persea americana*) and Their Health Benefits. *Antioxidants* (Basel). 2019;8(10):426. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6826385/>
- 2 Schwingshackl L et al. Monounsaturated fatty acids and risk of cardiovascular disease: synopsis of the evidence available from systematic reviews and meta-analyses. 2012 Dec 11;4(12):1989-2007. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3546618/>

NIP nutrient composition references:

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

NUTRITION INFORMATION

Serving size: 50g (1/4 of an average avocado raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	36g		72g
Energy	290kJ	3%	579kJ
Protein	0.8g	2%	1.6g
Total fat	6.6g	9%	13.2g
Saturated fat	1.0g	4%	1.9g
Polyunsaturated fat	1.4g		2.7g
Monounsaturated fat	7.4g		12.8g
Total Carbohydrates	0.1g	<1%	0.2g
Sugars	0g	0%	0g
Dietary fibre	3.8g	13%	7.5g
Sodium	3.5mg	<1%	7mg
Potassium	225mg		450mg
Niacin eq	1.1mg	10%	2.1mg
Pantothenic acid^	0.7mg	14%	1.4mg
Folate eq	45ug	23%	90ug
Total polyphenols^	71mg GAE		142mg GAE
Beta-carotene eq	38ug		75ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

doi:10.3390/antiox8100426

SUBSTANTIATION FOR AVOCADO

Individual consumer friendly nutrient content and permitted general level health claims:

- A quarter of an avocado (50g) provides almost a quarter (23%) of the Recommended Dietary Intake (RDI) of folate, a nutrient required for psychological function.
- A 50g serve of avocado (1/4 of an average avocado) provides 14% of the Recommended Dietary Intake (RDI) of pantothenic acid, needed for mental performance, reduction of tiredness and fatigue, and producing energy in the body.
- A quarter of an avo contains 10% RDI for niacin which is needed for maintaining the nervous system, psychological function and reducing tiredness and fatigue.
- Avocados are a good source of fibre with 4g in a quarter of an avo. Fibre helps keep the gut healthy and gut bacteria happy.
- Avocado contains 225mg of potassium in a 50g serve or about 1/4 an avo. Potassium is needed for a healthy nervous system.
- Avocados contain heart healthy unsaturated fats.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, such as avocado, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory FRUIT claim:

- *Avo better day* with avocados. A healthy, varied diet high in fruit, such as avocado, is good for mental wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Avocados are a brunch classic and their versatility means you can enjoy their mood-boosting, brain-boosting benefits any time of the day.

Technically avocados are a fruit but we use them in salads alongside other vegetables – perhaps their “fregetables”!

NUTRITION INFORMATION

Serving size: 50g (1/4 of an average avocado raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	36g		72g
Energy	290kJ	3%	579kJ
Protein	0.8g	2%	1.6g
Total fat	6.6g	9%	13.2g
Saturated fat	1.0g	4%	1.9g
Polyunsaturated fat	1.4g		2.7g
Monounsaturated fat	7.4g		12.8g
Total Carbohydrates	0.1g	<1%	0.2g
Sugars	0g	0%	0g
Dietary fibre	3.8g	13%	7.5g
Sodium	3.5mg	<1%	7mg
Potassium	225mg		450mg
Niacin eq	1.1mg	10%	2.1mg
Pantothenic acid^	0.7mg	14%	1.4mg
Folate eq	45ug	23%	90ug
Total polyphenols^	71mg GAE		142mg GAE
Beta-carotene eq	38ug		75ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

Interesting compounds in avocados

Avocados are rich in many natural compounds such as antioxidant polyphenols, flavonoids, tannins, carotenoids and vitamin E that have been shown to reduce oxidation and inflammation, which are involved in maintaining physical and mental wellbeing.¹

Avocados also contain folate and higher levels of this nutrient in the blood is associated with a lower risk of depression.²

Fibre and the brain

Avocados contain insoluble fibre (70%) and soluble fibre (30%) and these have prebiotic effects, which means they improve gut bacteria.¹ Diets low in fibre can disturb gut bacteria which is implicated in reduced psychological wellbeing and mood. Diets high in fibre can improve gut bacteria to positively affect psychological wellbeing. It does this because bacteria ferment fibre in the large intestine generating short chain fatty acids (SCFA) such as butyrate and propionate. These SCFAs have anti-inflammatory effects which help protect brain structure, function and behaviour and help overall brain maintenance.³

Vascular health and the brain

A dietary pattern with emphasis on healthy monounsaturated fats, such as olive oil, avocados, and nuts, helps prevent cardiovascular disease, type 2 diabetes, and cognitive decline.⁴

Avocados have been shown to help reduce cholesterol through their monounsaturated fat and plant sterol content.¹ Cardiovascular disease is also linked to brain conditions such as stroke, dementia and cognitive impairment. Several large, population studies have demonstrated that cardiovascular risk factors negatively influence overall brain health.⁵ This suggests that dietary patterns and components that are good for the heart are also good for the brain. There are also links between coronary heart disease and mental illness and they may share common causes.⁶

Avocado and cognition

Avocado consumption has a positive effect on cognition. A study of 84 overweight adults (25-45 years, 31 males) were randomised to receive a 12-week daily meal with fresh Hass avocado (n=47) or a control group (n = 37) that received an isocaloric meal with no avocado. Those eating the avocado meals performed better on a cognitive test. Attentional inhibition, as measured by the Flanker task, increased, but other cognitive measures were not changed.⁷

An earlier 2017 study of 40 healthy older adults, found that people who consumed one avocado a day for six months had improved cognition measured by improvements in working memory. Additionally, as macular pigment density increased with lutein, working memory and efficiency of approaching a problem also improved.⁸

Fruit, vegetables and mood

Australian research has found increased fruit and vegetables such as avocado can increase happiness, life satisfaction and wellbeing. In both adults and children, emerging evidence suggests that increased fruit intake improves psychological wellbeing.⁹

References for substantiation

1. Bhuyan DJ, Alsherbiny MA, Perera S, et al. The Odyssey of Bioactive Compounds in Avocado (*Persea americana*) and Their Health Benefits. *Antioxidants (Basel)*. 2019;8(10):426. doi:10.3390/antiox8100426 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6826385/>
2. Khosravi M, Sotoudeh G, Amini M et al. The relationship between dietary patterns and depression mediated by serum levels of folate and vitamin B12. *BMC Psychiatry* (2020) 20:63 <https://doi.org/10.1186/s12888-020-2455-2>
3. Dreher ML. Whole Fruits and Fruit Fiber Emerging Health Effects. *Nutrients*. 2018;10(12):1833. doi:10.3390/nu10121833 <https://pubmed.ncbi.nlm.nih.gov/30487459/>
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8. Scott TM, Rasmussen HM, Chen O, Johnson EJ. Avocado Consumption Increases Macular Pigment Density in Older Adults: A Randomized, Controlled Trial. *Nutrients*. 2017;9(9):919. doi:10.3390/nu9090919. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5622679/>
9. Mujcic R, J Oswald A. Evolution of Wellbeing and Happiness After Increases in Consumption of Fruit and Vegetables. *Am J Public Health*. 2016;106(8):1504-1510. doi:10.2105/AJPH.2016.303260. <https://pubmed.ncbi.nlm.nih.gov/27400354/>

NIP nutrient composition references:

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>
^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Avocado or *Persea Americana* and [mood/ avocado and mental/ avocado and brain/ avocado and wellbeing/ vitamin E and cognitive/avocado and antioxidant/ vitamin E diet and antioxidant/ cardiovascular disease and brain]

6. BANANA A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Turn your frown upside down. Bananas are folate-rich to keep your body and mind in tip top shape.
- Bounce back with bananas, your energy powerhouse packed with natural fruit sugars and low GI carbs.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie bananas.

Bananas:

- ✓ Rich in folate – psychological function
- ✓ Source of niacin – prevents tiredness
- ✓ Source of vitamin B6 – healthy nerve function
- ✓ Source of biotin – converts food to energy
- ✓ Source of vitamin C – reduces fatigue
- ✓ Source of magnesium – reduce stress
- ✓ Source of manganese – psychological wellbeing
- ✓ Source of fibre – gut health
- ✓ Low Glycemic Index – long lasting energy
- ✓ Contains natural fruit sugars – boost vitality
- ✓ Contains potassium – steady nerves
- ✓ Contains polyphenols - natural antioxidants

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity)

Banana fun facts

- Store ripe bananas in the fridge to make them last longer. The peels will darken but the flavour will stay.
- In Asian cuisine, banana plant leaves are used for food storage, as well as wrapping foods during cooking to help seal in flavour.
- Want to quickly ripen your green bananas? Place them in a brown paper bag with an apple or an already ripe banana.
- Don't dis the peel. Banana peels contain antioxidants and are used in traditional medicine as an antiseptic and anti-inflammatory.¹
- Bananas contain 76% moisture; that's even more than a human body which has on average 65% moisture.²

NUTRITION INFORMATION

Serving size: 150g (1 medium banana raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	114g		76g
Energy	591kJ	7%	394kJ
Protein	2.1g	4%	1.4g
Total fat	0.5g	<1%	0.3g
Saturated fat	0g	0%	0g
Total Carbohydrates	29.4g	10%	19.6g
Sugars	19.2g	21%	12.8g
Dietary fibre	3.3g	11%	2.2g
Sodium	0mg	0%	0mg
Potassium	519mg		346mg
Vitamin B6	0.3mg	19%	0.2mg
Niacin eq	1.1mg	11%	0.7mg
Folate eq	49.5ug	25%	33ug
Biotin	3.5ug	12%	2.3ug
Vitamin C	6mg	15%	4mg
Magnesium	46.5mg	15%	31mg
Manganese	0.6mg	11%	0.4mg
Total polyphenols^	232mg GAE		155mg GAE
Glycemic Index (GI) ^^	47		

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

- 1 Sidhu JS et al. Bioactive compounds in banana fruits and their health benefits/ *Food Quality and Safety* 2018;2(4):183–188, <https://doi.org/10.1093/fqsafe/fyy019> <https://academic.oup.com/fqs/article/2/4/183/5164297>
- 2 National Health and Medical Research Council. Nutrient Reference Values for Australia and New Zealand: water. <https://www.nrv.gov.au/nutrients/water>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SUBSTANTIATION FOR BANANA

Individual consumer friendly nutrient content and permitted general level health claims:

- Peel a banana and uncover a whole lot of goodness. Bananas are chock full of folate, with one medium banana providing a quarter of your daily folate requirements (25% of adult RDI). Folate helps to reduce tiredness and keeps your body and mind functioning normally.
- Niacin plays a key role in normal brain activity and helps to boost your mood. Eating one medium banana will give you more than 10% of your daily recommended intake.
- Bananas contain biotin – a B group vitamin needed to boost mood and help release energy from food. One banana provides 12% RDI.
- Who would believe it bananas contain vitamin C. A medium bananas provide 15% RDI and vitamin C helps energise the body and mind.
- Magnesium is a vital nutrient for optimal brain function and preventing tiredness. Eat a banana today and you will be on your way to achieving your daily magnesium requirements. One medium banana provides 15% of the RDI for magnesium.
- One banana provides 11% of the RDI for manganese a mineral which helps release energy from food.
- Peel a banana and the strings left behind contain fibre. Fibre keeps the gut healthy and promotes a healthy gut microbiome. One medium banana provides 3g of fibre.
- Bananas are an energy powerhouse with natural fruit sugars and low GI carbs for longer lasting vitality (GI=47).
- A banana provides 519mg of potassium an electrolyte needed for steady nerves.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as bananas, is good for mental wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 150g (1 medium banana raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	114g		76g
Energy	591kJ	7%	394kJ
Protein	2.1g	4%	1.4g
Total fat	0.5g	<1%	0.3g
Saturated fat	0g	0%	0g
Total Carbohydrates	29.4g	10%	19.6g
Sugars	19.2g	21%	12.8g
Dietary fibre	3.3g	11%	2.2g
Sodium	0mg	0%	0mg
Potassium	519mg		346mg
Vitamin B6	0.3mg	19%	0.2mg
Niacin eq	1.1mg	11%	0.7mg
Folate eq	49.5ug	25%	33ug
Biotin	3.5ug	12%	2.3ug
Vitamin C	6mg	15%	4mg
Magnesium	46.5mg	15%	31mg
Manganese	0.6mg	11%	0.4mg
Total polyphenols^	232mg GAE		155mg GAE
Glycemic Index (GI) ^^	47		

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and so not suitable for branded communications. Instead this information is for educational purposes only.

Beautiful bananas are one of the top ten raw fruit found to improve mental health.¹ Australian research shows that eating fruit such as bananas, can lead to increased happiness, wellbeing and overall life satisfaction.² So nothing spreads happiness like a golden yellow banana smiling back at you. The happy hormone serotonin in the brain has a positive effect on mood. Serotonin levels are dependent on the amino acid tryptophan and preliminary research shows eating foods containing tryptophan can improve mood and cognition.³ Woo-hoo bananas contain tryptophan too.

Bananas contain other natural phytochemicals too including polyphenol antioxidants. These antioxidants are important for their positive effects on brain health and wellbeing.^{4,5}

People who eat more fruit such as bananas have less perceived stress and negative mood. They're also more likely to be happy, have a positive mood, and be more satisfied with life – this includes feelings of meaning, purpose, and fulfillment.¹

So start your day off right and first thing tomorrow grab a banana and peel good to feel good.

References for substantiation

- 1) Brookie KL, Best GI, Conner TS. Intake of Raw Fruits and Vegetables Is Associated With Better Mental Health Than Intake of Processed Fruits and Vegetables. *Front Psychol.* 2018; 9: 487. doi:10.3389/fpsyg.2018.00487 <https://pubmed.ncbi.nlm.nih.gov/29692750/>
- 2) Głąbska D, Guzek D, Groele B, Gutkowska K. Fruit and Vegetable Intake and Mental Health in Adults: A Systematic Review. *Nutrients.* 2020;12(1):115.. doi:10.3390/nu12010115 <https://pubmed.ncbi.nlm.nih.gov/31906271/>
- 3) Hulsken S, Märtin A, Mohajeri MH, Homberg JR. Food-derived serotonergic modulators: effects on mood and cognition. *Nutr Res Rev.* 2013;26(2):223-234. doi:10.1017/S0954422413000164 <https://pubmed.ncbi.nlm.nih.gov/24134856/>
- 4) Singh B, Singh JP, Kaur A, Singh N. Bioactive compounds in banana and their associated health benefits - A review. *Food Chem.* 2016;206:1-11. doi:10.1016/j.foodchem.2016.03.033 <https://pubmed.ncbi.nlm.nih.gov/27041291/>
- 5) Sidhu JS et al. Bioactive compounds in banana fruits and their health benefits/ *Food Quality and Safety* 2018;2(4):183–188, <https://doi.org/10.1093/fqsafe/fyy019> <https://academic.oup.com/fqs/article/2/4/183/5164297>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SEARCH TERMS USED FOR PUBMED: Banana or *Musa acuminata* and review and diet and [mood/cognition/mental health/psychological wellbeing/ cognition/happiness/antioxidants]

7. BEETROOT A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Bounce to the beet, boost your vitality with folate rich beetroots they help fight fatigue.
- *Beet your brain, boost your mood with folate rich beetroots.*

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie beetroots.

Beetroot:

- ✓ Rich in folate – energy booster
- ✓ *Rich in folate – mood booster*
- ✓ Source of fibre – healthy gut function
- ✓ Contains potassium – good nerves
- ✓ Contains betanin – red purple pigment antioxidant

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Beetroot fun facts:

- Eat beets: roots and leaves. You can eat the beet roots, leaves and stalks.
- The blood-red colour of beet roots is due to antioxidant betalains (betanin and betaxanthin).^{1,2}
- Betanin is a natural dye so it does stain – to remove stain pre-treat the stain with lemon juice or vinegar for five mins, rinse with water, flush the underside with laundry liquid and water, then machine wash.
- Some people can't breakdown betanin so eat too many beetroots and you'll pee and poop pink.
- Beetroots have a sweet earthy flavour because they naturally contain sugars (8g in a 1/2 cup cooked).
- Have you tried beetroot and horseradish? It will blow your mind!

NUTRITION INFORMATION

Serving size: 75g (1/2 cup baked)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	63g		84g
Energy	185kJ	2%	246kJ
Protein	1.7g	4%	2.3g
Total fat	<1g	<1%	<1g
Saturated fat	0g	0%	0g
Total Carbohydrates	7.7g	2%	10.2g
Sugars	7.7g	9%	10.2g
Dietary fibre	3.2g	11%	4.3g
Sodium	50mg	2%	66mg
Potassium	266mg		354mg
Folate eq	80.3ug	40%	107ug
Total polyphenols^	141mg GAE		188mg GAE
Betanin^^	16.5mg		22mg
Betaxanthin^^	0.56mg		0.75mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

1. Lee EJ, An D, Nguyen CT, et al. Betalain and betaine composition of greenhouse- or field-produced beetroot (Beta vulgaris L.) and inhibition of HepG2 cell proliferation. *J Agric Food Chem.* 2014;62(6):1324-1331. doi:10.1021/jf404648u <https://pubmed.ncbi.nlm.nih.gov/24467616/>
2. Clifford T, Constantinou CM, Keane KM, et al. The plasma bioavailability of nitrate and betanin from Beta vulgaris rubra in humans. *Eur J Nutr.* 2017;56(3):1245-1254. doi:10.1007/s00394-016-1173-5 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5346430/>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^ Clifford T, Constantinou CM, Keane KM, et al. The plasma bioavailability of nitrate and betanin from Beta vulgaris rubra in humans. *Eur J Nutr.* 2017;56(3):1245-1254. doi:10.1007/s00394-016-1173-5 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5346430/>

SUBSTANTIATION FOR BEETROOT

Individual consumer friendly nutrient content and permitted general level health claims:

- Bounce to the beet, boost your vitality with folate-rich beetroots they help fight fatigue. With 40% of the RDI in just ½ a cup of baked beets.
- Beet your brain - boost your mood with folate rich beetroots. Just ½ cup baked beetroots contain 80ug folate.
- Purple baked beets are a source of fibre. Just 3g fibre in ½ cup for a healthy gut function.
- Beetroots contain 266mg potassium in a 75g serve. Potassium is a necessary for nerve function.
- Beetroots contain the red purple pigment betanin – 17mg in a 75g serve. Betanin has antioxidant properties.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables such as purple beetroots is good for brightening your mood, brain function, psychological wellbeing and happiness.

Subcategory COOKING claim:

- Getting baking beetroots. Cooking with others has positive effects on wellbeing and quality of life.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 75g (1/2 cup baked)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	63g		84g
Energy	185kJ	2%	246kJ
Protein	1.7g	4%	2.3g
Total fat	<1g	<1%	<1g
Saturated fat	0g	0%	0g
Total Carbohydrates	7.7g	2%	10.2g
Sugars	7.7g	9%	10.2g
Dietary fibre	3.2g	11%	4.3g
Sodium	50mg	2%	66mg
Potassium	266mg		354mg
Folate eq	80.3ug	40%	107ug
Total polyphenols^	141mg GAE		188mg GAE
Betanin^^	16.5mg		22mg
Betaxanthin^^	0.56mg		0.75mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

How would you describe the colour of beetroots – is it red, pink, purple, crimson, magenta? The colour is beetroot's secret powerhouse. The natural pigments betalains are antioxidants. Beetroots also contain nitrates which help relax blood vessels improving blood flow. All-important properties for a healthy brain function.

Beetroot is considered a high nitrate vegetable with over 250mg per 100g and they are easily juiced hence beetroot juice is often used in research studies.¹ There is a research study underway right now looking at the effect of 140ml of nitrate-rich beetroot juice a day for 13 weeks on the cognition and brain blood flow of 60 overweight and obese older adults. We'll need to wait a bit for those results though.²

Fortunately others have found in 15 amateur athletes consuming 70ml of nitrate rich beetroot juice, the juice increased their peak power output and lowered their tension (a measure of mood) following a 30 sec hard cycling test.³ This is because nitrates convert to nitric oxide in the body and this help relax blood vessels, allowing better blood flow.

Earlier studies have found improved brain blood flow after consuming nitrate-rich beetroot juice.^{4,5} For instance 40 healthy adults received either a placebo or 450 ml beetroot juice (~5.5mmol nitrate). Ninety minutes later they performed a selection of cognitive tasks that activated the frontal cortex for nearly an hour. The brain was scanned for oxygen levels and blood flow. Cognitive performance was improved on the serial 3s subtraction task. This study suggests one possible mechanism by which vegetable consumption may have beneficial effects on brain function.⁵

A study in older adults showed no improvement in cognition but they only consumed 140ml of nitrate-rich beetroot juice which may not have been enough.⁶ Although another study in older adults found after consuming just 70ml of beetroot juice (BRJ) a day and exercising three 50min walking sessions a week for six weeks, the exercise + BRJ group had brain networks that more closely resembled those of younger adults. Thus showing the potential enhanced brain neuroplasticity with beetroot juice and exercise.⁷

Animal studies assessing a beetroot leaf extract found improved memory due to improved antioxidant capacity and reduced anxiety and stress.^{8,9}

The blood-red colour of beet roots is due to betalains (betanin and betaxanthin). These compounds have antioxidant properties and possibly anti-cancerous effects.¹⁰ A betalain supplement was found to improve quality of life measures to some extent.¹¹

Vegetables and mood in general

A few studies have analysed the vegetable food group separately and found people enjoying higher amounts of vegetables had an 18% lower risk of experiencing symptoms of depression.¹² Other researchers found on the days when more vegetables are eaten means enhanced psychological wellbeing.¹³ On days when individuals consumed 0.15 more portions of vegetables (and 0.11 more portions of fruit), they experienced higher positive affect, which included feeling calmer, happier, and more energetic.^{14,15} An Australian Mediterranean diet study found people in the study with greater vegetable diversity had greater reduction in depression and improved mental health scores - sustained over 6 months.¹⁶

Benefits of cooking more than just food

Cooking can promote positivity, as it requires mastering a number of skills that exercise the brain and require heightened cognition. Mastering these skills can lead to improved mood, self-confidence, as well as self-awareness.¹⁷

Beetroots can be:

- boiled or steamed, peeled and then eaten warm with or without butter;
- cooked, pickled, and then eaten cold as a condiment; or
- peeled, shredded raw, and then eaten as a salad.

Their sweet, earthy flavour goes well with sour, salty tastes or both such as goat's cheese. They also pair well with chocolate and orange. Now wouldn't that make a great green salad addition – beetroot (roots and leaves), orange slices and goat's cheese.

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SEARCH TERMS USED FOR PUBMED: Beetroot and/or *Beta vulgaris* and diet and [mood/ psychological wellbeing/ optimism/ brain/ cognition/betalain/nitrate]

8. BLACKBERRY A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- No more black moods with vitamin-C packed blackberries.
- Super charge with blackberries the antioxidant-containing superfood.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie blackberries.

Blackberry:

- ✓ Rich in vitamin C – mood booster
- ✓ Excellent source of dietary fibre – keeps you regular
- ✓ Source of folate – beat tiredness
- ✓ Source of vitamin E – antioxidant protection
- ✓ Source of magnesium – good brain function
- ✓ Source of manganese – energy production
- ✓ Contains polyphenols – natural antioxidants
- ✓ Contains beta-carotene – orange coloured antioxidant
- ✓ Contains anthocyanins – red purple pigment antioxidant
- ✓ Contains natural fruit sugars – boost vitality

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Blackberry fun facts:

- Blackberries are naturally high in moisture, which makes them juicy and luscious to eat.
- Blackberries are a perfect topping for a breakfast cereal or addition to green salad or a fresh fruit dessert.
- Blackberries have particularly high levels of ellagitannins, a class of polyphenols with strong antioxidant activity, anti-inflammatory and antibacterial properties. The high levels of ellagitannins give blackberries a healthy, powerful punch.¹
- Good news! Storing your blackberries in the fridge does not diminish the powerful antioxidant benefits.²
- In traditional folk medicine, blackberries were used to treat inflammatory bowel disease.³
- Try pairing blackberries with almonds, duck, venison, beef, black pepper, lemon, chocolate and cream.

NUTRITION INFORMATION

Serving size: 125g (1 punnet raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	106g		85g
Energy	264kJ	3%	211kJ
Protein	1.8g	4%	1.4g
Total fat	0.4g	<1%	0.3g
Saturated fat	0g	0%	0g
Total Carbohydrates	9.4g	3%	7.5g
Sugars	9.4g	10%	7.5g
Dietary fibre	7.6g	25%	6.1g
Sodium	0mg	0%	0mg
Folate eq	42.5ug	21%	34ug
Vitamin C	47.5mg	119%	38mg
Vitamin E	1.8mg	18%	1.4mg
Magnesium	37.5mg	12%	30mg
Manganese	0.7mg	14%	0.6mg
Total polyphenols^	596mg GAE		477mg GAE
Beta-carotene eq	400ug		320ug
Anthocyanins^^	306mg		245mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

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SUBSTANTIATION FOR BLACKBERRY

Individual consumer friendly nutrient content and permitted general level health claims:

- No more black moods. A punnet of blackberries provides all your vitamin C needs for the day. Vitamin C is natural mood booster.
- Blackberries are an excellent source of fibre to keep your bowel healthy with nearly 8g per punnet.
- Feeling tired? Snack on a punnet of lush blackberries to get 21% of your daily folate needs and keep tiredness at bay.
- A serve of blackberries provides 18% of your RDI (recommended dietary intake) for vitamin E. This powerful antioxidant protects body cells from free radical damage.
- Prevent brain drain with blackberries - 125g gives 12% of daily magnesium requirements, essential for good brain function.
- Blackberries are the perfect snack for keeping up your energy levels. You'll get 14% of your manganese requirements in a punnet. Manganese helps with energy production.
- Blackberries are packed full of antioxidant polyphenols, the ultimate fighter to protect body cells.
- Blackberries are richly pigmented with anthocyanins. A unique type of natural antioxidant that keeps cells in tip top condition.
- Hidden underneath the black is orange coloured beta-carotene - a carotenoid pigment and antioxidant cell protector. One punnet of blackberries provides 400ug of beta-carotene.
- Look no further than blackberries for the perfect afternoon pick me up snack. They can boost your energy naturally from fruit sugars.

NUTRITION INFORMATION

Serving size: 125g (1 punnet raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	106g		85g
Energy	264kJ	3%	211kJ
Protein	1.8g	4%	1.4g
Total fat	0.4g	<1%	0.3g
Saturated fat	0g	0%	0g
Total Carbohydrates	9.4g	3%	7.5g
Sugars	9.4g	10%	7.5g
Dietary fibre	7.6g	25%	6.1g
Sodium	0mg	0%	0mg
Folate eq	42.5ug	21%	34ug
Vitamin C	47.5mg	119%	38mg
Vitamin E	1.8mg	18%	1.4mg
Magnesium	37.5mg	12%	30mg
Manganese	0.7mg	14%	0.6mg
Total polyphenols^	596mg GAE		477mg GAE
Beta-carotene eq	400ug		320ug
Anthocyanins^^	306mg		245mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory FRUIT claim:

- No more black moods with blackberries. A healthy varied diet high in fruit, such as blackberries, is good for mental wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Fresh blackberries are known for their sweet, decadent flavour and culinary versatility. Yet, they're also a nutrient-rich, natural superfood. They're an excellent source of fibre and contain unique antioxidant pigments such as rich dark anthocyanins and orange beta-carotene.

Flavonoid antioxidants found in blackberries may improve cognition and prevent memory loss that occurs naturally with ageing. In particular, it's the flavonoids and anthocyanins in blackberries that have the greatest potential to impact the way our brain thinks and learns.¹ Anthocyanins give blackberries the deep purple colour and have been researched for their potential anti-inflammatory and anti-ageing action, which can impact overall brain health.^{2,3}

Enjoying a superberry smoothie including blackberries may just get the brain's juices flowing – 40 people aged 20–30 years drank a 400mL smoothie containing equal parts blueberry, strawberry, raspberry and blackberry. Following cognitive tests and mood surveys the smoothie drinkers maintained accuracy on both cognitive tasks up to and including 6 hours after drinking the smoothie. They also demonstrated quicker response times. There was a positive effect on mood between 4-6 hours after the drink. So if you have a busy afternoon and need maximum brain power get stuck into the berries from mid-morning.⁴

Preliminary research using an animal model of bipolar disorder found a blackberry extract had anti-inflammatory effects and reduced hyperlocomotion changes in the brain indicating a reduction in mania.⁵

Diets high in fibre can improve gut health which has a positive flow on effect on psychological wellbeing. Short Chain Fatty Acids (SCFA) such as butyrate directly affect brain physiology and behaviour.⁶ Fibre-rich blackberries increase the beneficial bacteria in the large intestine and promote production of SCFAs such as butyrate which feed these good gut bugs.^{7,8}

In general a healthy, varied diet high in fruit, such as blackberries, and vegetables is good for mental wellbeing and happiness. A review of 61 studies analysed the association between fruit and vegetable intake and mental health in adults. They found a high total intake of fruit and vegetables (and some specific subgroups including berries) may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms. The authors concluded that fruit and/or vegetables have a positive influence on mental health and the general recommendation to consume at least 5 portions of fruit and vegetables a day may be beneficial for mental health.⁹

Another review of 17 studies found an association between higher fruit and vegetable intake and better mental health in adolescents. The components of mental health assessed included health-related quality of life, mental health status, happiness and self-esteem as well as anxiety, stress and distress and depressive symptoms. The strongest benefits were found for fresh fruit and green and yellow vegetables.¹⁰

Another group of researchers found intake of *raw* fruit and vegetables is associated with better mental health. The top 10 raw foods related to better mental health included fresh berries.¹¹

A worksite health promotion initiative that encouraged employees to eat a healthy vegetable-based diet resulted in significant improvements in their sleep quality, quality of life, and depressive symptoms. They were given the acronym 'G-BOMBS +T' to remind them what to eat, and the letters stood for Greens - Beans, Onions, Mushrooms, **Berries**, Seeds and nuts + Tomatoes.¹²
Gotta love a good acronym!

Fresh fruit and vegetables also contain about 60-90% water so eating the recommended 2 serves of fruit and five serves of veg a day will contribute about 500-700ml of fluids to the body. Including a punnet of blackberries in your day will add about 100ml to total fluids. Just a small loss of body fluid (around 1%) is enough to affect brain function and mood.¹³

There are so many reasons to snack on a punnet of blackberries. It's also a much healthier alternative to unhealthy snacks such as chocolate or crisps, and may lead to lower levels of anxiety and emotional distress.¹⁴

So whether it's a handful on their own or enjoyed with many other favourite sweet or savoury ingredients (think goat's cheese, peach, apple and almond), any excuse will do to enjoy superfood blackberry goodness.

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SEARCH TERMS USED FOR PUBMED: Blackberry or <i>Rubus fruticosus</i> and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]
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9. BLUEBERRY A GOOD MOOD FOOD

WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- You won't feel blue with blueberries. A well-known antioxidant superfood.
- Sweeten up your mood/Sugar coat your mood with natural fruit sugars from blueberries.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/Aussie blueberries.

Blueberries:

- ✓ Contains polyphenols - natural antioxidants
- ✓ Contains anthocyanins – red purple pigment antioxidant
- ✓ Contains natural fruit sugars – for energy
- ✓ Good source of fibre – gut wellness

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Blueberry fun facts:

- The silvery sheen (or “bloom”) found on the skin of blueberries is a naturally occurring compound that helps protect the fruit. This is why you should only wash blueberries right before you're going to eat them. Blueberries can be stored in the refrigerator and will keep fresh for up to 10 days.
- The darker the blueberry the more ripe it is as the anthocyanin content (the blue/purple/red pigment) increases as the berries ripen.¹
- Blueberries are a guiltless indulgence – they add sweet, delectable deliciousness to breakfast cereals, yoghurt, smoothies or ice cream.
- People have been eating blueberries for more than 13,000 years.

NUTRITION INFORMATION

Serving size: 125g (1 punnet raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	105g		84g
Energy	243kJ	3%	194kJ
Protein	0.6g	1%	0.5g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	12.0g	4%	9.6g
Sugars	11.5g	13%	9.2g
Dietary fibre	4.4g	15%	3.5g
Sodium	2.5mg	<1%	2mg
Total polyphenols [^]	389mg GAE		311mg GAE
Anthocyanins [^]	456mg		365mg

Source: Aust Food Comp Data or [^] USDA data

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

References for website:

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NIP nutrient composition database references

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[^]USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^{^^}Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem.* 2006;54(11):4069–4075. doi:10.1021/jf060300I <https://pubmed.ncbi.nlm.nih.gov/16719536/>

SUBSTANTIATION FOR BLUEBERRY

Individual consumer friendly nutrient content and permitted general level health claims:

- You won't feel blue with blueberries. A well-known antioxidant superfood with 390mg GAE of polyphenol antioxidants in a punnet.
- What puts the blue in blueberry? Anthocyanins – the blue purple pigment and natural antioxidants which protect cells from free radical damage (456mg in a punnet).
- Sweeten up your mood with natural fruit sugars from blueberries – the natural energy booster with 12g fruit sugars in a punnet. A great after sport recovery snack.
- Blueberries are a gut friendly food. A good source of fibre with 4g in a 125g serve.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT claim:

- A healthy, varied diet high in fruit such as blueberries is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 125g (1 punnet raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	105g		84g
Energy	243kJ	3%	194kJ
Protein	0.6g	1%	0.5g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	12.0g	4%	9.6g
Sugars	11.5g	13%	9.2g
Dietary fibre	4.4g	15%	3.5g
Sodium	2.5mg	<1%	2mg
Total polyphenols^	389mg GAE		311mg GAE
Anthocyanins^	456mg		365mg

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

There's nothing blue about blueberries – these sweet little morsels pack a powerful punch to the brain with a number of benefits for cognition, memory and mood.

Blueberries are abundant in blue purple anthocyanin pigments (about 60% of all polyphenols found in blueberries).¹ There is increasing evidence that anthocyanins protect brain health. In a prospective analysis of 16,000 women in the Nurse's Health Study, greater intake of blueberries was associated with slower rates of cognitive decline in older adults, with an estimated delay in decline of about two and a half years.² Anthocyanins can cross the blood-brain barrier and have a positive effect on areas of learning and memory.³

A new 2020 Australian systematic review of 12 studies (5 studies conducted in children, 1 study in young adults, and older people with either no known cognitive impairment (4 studies) or indicated cognitive impairment (2 studies)). Eight studies reported blueberry consumption or supplementation, at various doses and time lengths, improved cognitive performance (short- and long-term memory and spatial memory). For mood - out of five studies only one study reported significant improvements in positive affect mood from blueberry consumption, whereas four studies reported no improvements.⁴

A UK systematic review analysed 11 studies - 4 studies in children aged 7-10 years, 4 studies in adults aged 60 years and older, and 3 studies considering adults suffering from mild cognitive impairment (MCI). The researchers found benefits for blueberry intake on cognition function: memory and executive function in children; and memory, executive function, and psychomotor function in older healthy and MCI adults.⁵

Several studies in children show how important blueberries are during brain development. Research has shown the beneficial effects of flavonoids on the brain's executive function. If this is impaired these cognitive processes maintain depression and low mood. Twenty one young adults (18–21 years old) consumed a flavonoid-rich blueberry drink and later a matched placebo drink, and similarly a group of 50 children (7–10 years old) did the same. Mood was assessed using the Positive and Negative Affect surveys before and 2 hours after drinking the beverages. In both groups, the blueberry drink increased positive affect but had no effect on negative affect. This suggests blueberry is a good mood food.⁶

Another study in 54 children aged 7-10 year olds, drinking 200ml of a blueberry drink (equivalent to 240 g or 1½ cups of fresh blueberries) found positive effects on cognition. They had better attention; enhanced verbal memory performance, recalling more words on short delay; and memory acquisition measures than those drinking the placebo. Definitely need to add blueberries to kids' breakfasts and school fruit snacks.⁷

An earlier study in just 14 children (8-10 years) drinking a flavonoid-rich blueberry drink or a placebo, found the kids who were lucky enough to get the blueberry drink performed better in memory tests compared to those who got the placebo.⁸

There are also a number of rat and mice studies that have shown improvements in cognition and memory from blueberry components added to their diets.⁹⁻¹¹

Enjoying a superberry smoothie including blueberries may just get the brain's juices flowing – 40 people aged 20–30 years drank a 400mL smoothie containing equal parts blueberry, strawberry, raspberry and blackberry. Following cognitive tests and mood surveys the smoothie drinkers maintained accuracy on both cognitive tasks up to and including 6 hours after drinking it. They also demonstrated quicker response times. Blueberries caused non-significant positive effect on mood after two hours. So if you have a busy afternoon and need maximum brain power get stuck into the berries from mid-morning.¹²

Blueberries appear to be able to boost good bifidobacteria found in the gut¹³ while also inhibiting the growth of bad bacteria – this is due to the antioxidant polyphenols they contain¹⁴. This may also help explain the benefits of blueberries on the brain – due to the gut-brain connection.

In general a healthy, varied diet high in fruit, such as blueberries, and vegetables is good for mental wellbeing and happiness.

A review of 61 studies analysing the association between fruit and vegetable intake and mental health in adults found a high total intake of fruit and vegetables (and some of their specific subgroups including berries) may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms. The authors concluded that fruit and/or vegetables have a positive influence on mental health and the general recommendation to consume at least 5 portions of fruit and vegetables a day may be beneficial for mental health.¹⁵

A review of 17 studies found an association between higher fruit and vegetable intake and better mental health in adolescents. The components of mental health assessed included health-related quality of life, mental health status, happiness and self-esteem as well as anxiety, stress and distress and depressive symptoms. The strongest benefits were found for fresh fruit and both green and yellow vegetables.¹⁶

Intake of raw fruit and vegetables is associated with better mental health. The top 10 raw foods related to better mental health included fresh berries.¹⁷

Fresh blueberries are delicate and are often processed soon after harvest to preserve them. Quick freezing is a widely used means to preserve blueberries, to retain vitamin C, total polyphenols, anthocyanins, and antioxidant capacity.¹⁸ So if you can't get fresh Australian blueberries, frozen ones are just as good.

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SEARCH TERMS USED FOR PUBMED: Blueberries or *Vaccinium cyanococcus* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

10. BOK CHOY A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Bok Choy pure joy. With vitamin C for a happy mood.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie Bok Choy.

Bok Choy:

- ✓ Source of vitamin C – mood enhancer
- ✓ Source of vitamin B6 - beat tiredness
- ✓ Source of fibre – gut health
- ✓ Contains fluids – for hydration

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Bok Choy fun facts:

- Bok Choy was first cultivated in China 5000 years ago and belongs to the *Brassica* family.
- 'Bok choy' is Cantonese for 'white vegetable'.
- Bok choy develops oval, spoon-shaped, glossy, dark green leaves. Unlike the true cabbage, bok choy does not have a leafy head. Instead, leaves are arranged in clusters that resemble the clusters of the celery stalks.
- The leaves of bok choy are green, and the stalks are coloured white to green, depending on the variety. 'Pak choy' is a green stemmed variety.
- Bok choy has a sweet, mustard-like, mild flavour and crunchy texture. It can be consumed raw in salads, but is more commonly cooked (stems and leaves) in stews, soups, spring rolls and stir-fries.

NUTRITION INFORMATION

Serving size: 75g (1/2 cup stir fried)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	70g		93g
Energy	62kJ	1%	82kJ
Protein	2.0g	4%	2.6g
Total fat	0.2g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	0.5g	<1%	0.6g
Sugars	0.5g	<1%	0.6g
Dietary fibre	2.0g	7%	2.6g
Sodium	42mg	2%	56mg
Vitamin B6	0.3mg	19%	0.4mg
Vitamin C	7.5mg	19%	10.0mg
Beta-carotene eq	408ug		544ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

References for website:

<http://tenrandomfacts.com/bok-choy/>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL

<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR BOK CHOY

Individual consumer friendly nutrient content and permitted general level health claims:

- Half a cup of this popular Asian vegetable bok choy provides 19% of your daily vitamin C needs to bring the joy – contributing to psychological wellbeing.
- Add half a cup of bok choy to your soups, salads or stir-fries and beat tiredness thanks to vitamin B6. A serve provides 19% of your daily vitamin B6 needs.
- Bok choy is a favourite green leafy vegetable to keep your gut happy and healthy as half a cup provides 2g towards your daily fibre needs.
- Did you know bok choy contributes towards body hydration as it contains 93% fluids?

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as bok choy, as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables, such as bok choy, is good for brightening your mood, brain function, psychological wellbeing and happiness.

Subcategory COOKING claim:

- Bok choy is a versatile green leafy vegetable in soups, salads and stir-fries. Cooking together has positive effects on wellbeing and quality of life.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Bok choy is the staple Asian vegetable that lightens up so many dishes with its vibrant green and white stems. It can also lighten your mood due to its brain health benefits.

Boy choy is a member of the *Brassica* family along with broccoli, Brussel sprouts, cabbage and kale. Brassicas like bok choy contain beneficial phytonutrients called glucosinolates, that are converted into isothiocyanates.¹ Isothiocyanates show protective effects against cardiovascular disease, inflammatory disorders and brain degenerative diseases, as well as promising improvements for brain function.^{2,3} Oxidative stress and inflammation are also commonly associated with brain disorders. Isothiocyanates have double benefits as they have both antioxidant and anti-inflammatory activity.⁴

NUTRITION INFORMATION

Serving size: 75g (1/2 cup stir fried)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	70g		93g
Energy	62kJ	1%	82kJ
Protein	2.0g	4%	2.6g
Total fat	0.2g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	0.5g	<1%	0.6g
Sugars	0.5g	<1%	0.6g
Dietary fibre	2.0g	7%	2.6g
Sodium	42mg	2%	56mg
Vitamin B6	0.3mg	19%	0.4mg
Vitamin C	7.5mg	19%	10.0mg
Beta-carotene eq	408ug		544ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

A few studies have analysed the effect of vegetables on mood in general and found people enjoying higher amounts of vegetables had an 18% lower risk of experiencing symptoms of depression.⁵ Other researchers found the days when more vegetables are eaten means enhanced psychological wellbeing.⁶ On days when individuals consumed 0.15 more portions of vegetables (and 0.11 more portions of fruit), they experienced higher positive affect, which included feeling calmer, happier, and more energetic.^{7,8}

There is now good evidence that higher fruit and vegetable intake is also related to better mental health. Research has established that people who eat more fruit and vegetables have a higher likelihood of greater happiness, positive mood, life satisfaction and social and emotional “flourishing” - feelings of meaning, purpose, and fulfilment in life. Green leafy vegetables were listed in the top 10 foods for better mental health.⁹

A review of 61 studies in adults found a high total intake of fruit and vegetables (including green leafy vegetables) may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms.¹⁰

Another review of 17 studies found an association between higher fruit and vegetable intake and better mental health in adolescents. The components of mental health assessed included health-related quality of life, mental health status, happiness and self-esteem as well as anxiety, stress and distress and depressive symptoms. The strongest benefits were found for green vegetables among others.¹¹ So get your greens in with a serve of bok choy.

Since bok choy is such a versatile food and can be enjoyed in so many types of dishes, it’s a great way to increase your daily vegetable intake. A study of young adults found consuming 7-8 servings of fruit and vegetables predicted greater positive moods such as joy, interest, and alertness on the day they ate them, and the day afterward.¹²

Bok Choy, like most fruit and vegetables, is high in water content so eating the recommended 2 serves of fruit and 5 serves of veg a day will contribute about 500-700ml of fluids to the body. The brain contains 75% water and just a small water loss (around 1%) can affect brain function.¹³ Dehydration is a reliable predictor of impaired cognition as dehydration is thought to effect energy production in brain cells and reduce transmitters involved in learning and memory. These can also occur with aging.¹⁴

Cooking can promote positivity, as it requires mastering a number of skills that exercise the brain and require heightened cognition. Mastering these skills can lead to improved mood, self-confidence, as well as self-awareness.¹⁵ So get cooking with bok choy – a key ingredient in Asian food but versatile so can be added to many others dishes.

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 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Bok choy and *Brassica rapa subsp. Chinensis* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

11. BROCCOLI A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Feel good florets! Broccoli is bursting with vitamin C to boost your emotional wellbeing.
- Bloom with broccoli! These little green trees contain folate to help your mind and body flourish

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie broccoli.

Broccoli:

- ✓ Rich in vitamin C – emotional wellbeing
- ✓ Rich in folate – energiser
- ✓ Source of dietary fibre – happy gut
- ✓ Contains carotenoids – antioxidant protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Broccoli fun facts:

- Ex-Beatle Ringo Starr just turned 80. When asked by Rolling Stone magazine how he stays looking decades younger he replied, “I eat broccoli on everything...”¹
- Broccoli is part of the big happy *Brassica* family of vegetables that includes cabbage, cauliflower and kale.
- Don’t ditch the stems and leaves, eat them too as they contain nutrients and beneficial phytonutrients.²
- Broccoli contains a phytonutrient called sulforaphane with an antioxidant effect for heart health.³
- To make a quick broccoli soup using the florets, stems and leaves, simply chop and cook until tender, then blend with some liquid stock. For extra flavour, add a little blue cheese or parmesan. Serve with fresh cracked black pepper and wholegrain sourdough bread. Quick, easy and yum!

NUTRITION INFORMATION

Serving size: 75g veg [1/2 cup microwaved]

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	69g		92g
Energy	85kJ	1%	113kJ
Protein	2.5g	5%	3.3g
Total fat	0.3g	<1%	0.4g
Saturated fat	0g	0%	0g
Total Carbohydrates	1g	<1%	1.3g
Sugars	1g	1%	1.3g
Dietary fibre	2.2g	7%	2.9g
Sodium	9.8mg	<1%	13mg
Folate eq	65.3ug	33%	87ug
Vitamin C	42.8mg	107%	57mg
Total polyphenols [^]	160mg GAE		213mg GAE
Beta-carotene eq	339ug		452ug
Lutein & zeaxanthin [^]	810ug		1080ug

Source: Aust Food Comp Data or [^] USDA

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

References for website:

- 1 <https://www.rollingstone.com/music/music-features/ringo-starr-80th-birthday-interview-1024596/>
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[^]USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR BROCCOLI

Individual consumer friendly nutrient content and permitted general level health claims:

- Half a cup of cooked broccoli contains your entire day's recommended amount of vitamin C. Vitamin C helps boost your emotional wellbeing through supporting neurological and psychological function.
- Half a cup of cooked broccoli provides a third of your recommended daily amount of folate. Folate energises the mind and body through enabling psychological function and reducing fatigue.
- Half a cup of cooked broccoli (75g) is a source of fibre providing 2g. Fibre is needed for an optimal microbiome and a healthy gut.
- Broccoli contains colourful antioxidant carotenoids (orange beta-carotene and yellow lutein and zeaxanthin) that help protect the body from oxidative stress.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as broccoli, as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables, such as broccoli, is good for brightening your mood, brain function, psychological wellbeing and happiness.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

You've heard the expression 'can't see the forest for the trees' sometimes there's good stuff to be found if you look more closely at the trees, in this case 'little trees' of broccoli.

Interesting compounds in broccoli

Phytonutrients

Broccoli is a member of the *Brassica* family along with bok choy, Brussel sprouts, cabbage and kale. Brassicas contain beneficial phytonutrients called glucosinolates. The major glucosinolates in broccoli are glucoraphanin and neoglucobrassicin, and these are converted into isothiocyanates such as sulforaphane when these vegetables are cut.¹

Isothiocyanates show protective effects against cardiovascular disease, inflammatory disorders and degenerative diseases of the brain.²

NUTRITION INFORMATION

Serving size: 75g veg [1/2 cup microwaved]

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	69g		92g
Energy	85kJ	1%	113kJ
Protein	2.5g	5%	3.3g
Total fat	0.3g	<1%	0.4g
Saturated fat	0g	0%	0g
Total Carbohydrates	1g	<1%	1.3g
Sugars	1g	1%	1.3g
Dietary fibre	2.2g	7%	2.9g
Sodium	9.8mg	<1%	13mg
Folate eq	65.3ug	33%	87ug
Vitamin C	42.8mg	107%	57mg
Total polyphenols^	160mg GAE		213mg GAE
Beta-carotene eq	339ug		452ug
Lutein & zeaxanthin^	810ug		1080ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Polyphenols are powerful antioxidants and broccoli leaves have even higher amounts than the florets. To get the most antioxidant benefit from broccoli, eat the leaves as well. The deep green colour of broccoli comes from colourful carotenoids (orange beta-carotene) masked by green chlorophylls and both have antioxidant activity. The yellow carotenoids lutein and zeaxanthin are also present in smaller amounts.¹

Oxidative stress is often linked with degenerative disorders of the brain, whereas inflammation is linked to cardiovascular disease and brain disorders. Our isothiocyanate friends from *Brassica* vegetables have double benefits as they have both antioxidant and anti-inflammatory activity.³

Carotenoids appear to have cognitive benefits. In the large US NHANES study, the highest consumers of lutein and zeaxanthin performed better in cognitive tests than the lowest consumers.⁴

Dietary fibre

Dietary fibre is important for gut health and having an optimal community of bacteria in the gut (microbiota) is important for converting glucosinolates noted above into isothiocyanates.⁵ Broccoli contains a both fibre and glucosinolates so more powerful when working together.

Diets high in fibre can optimise the microbiota to positively impact psychological wellbeing. Short Chain Fatty Acids (SCFA) such as butyrate and propionate directly affect brain physiology and behaviour by reducing brain inflammation and managing overall brain maintenance.⁶

Fruit and vegetables, mental health, psychological wellbeing and mood

There is now good evidence that higher fruit and vegetable intake is related to better mental health. Research has established that people who eat more fruit and vegetables have a lower incidence of mental disorders, including lower rates of depression, stress and negative mood. And they also have a higher likelihood of greater happiness, positive mood, life satisfaction and social and emotional “flourishing” - feelings of meaning, purpose, and fulfilment in life.⁷

An Australian study assessing food diaries and surveys of 12,385 Australian adults found increased fruit and vegetable consumption predicted increased happiness, life satisfaction and wellbeing. The increase in life satisfaction from the highest fruit and vegetable consumption (8 portions a day) over the period of two years was equal to the psychological gain of moving from unemployment to employment.⁸

Evidence suggests that the health benefits of fruit, vegetables, and other plant foods are due to the interactions between bioactive compounds (such as phytochemicals and antioxidants) and other nutrients in whole foods. So it is important to consume a variety of fruit, vegetables and other plant foods for health and wellbeing rather than dietary supplements.⁹

You are better off cooking broccoli too as more of the nutrients and isothiocyanates are released with cooking but they can be lost in cooking water. These compounds are also responsible for the sulfur based aromas so quick cooking methods with as little water are best for retaining nutrients and generating a milder flavour. Try steaming, microwaving and stir frying – unless it’s a soup or stew.¹⁰

References for substantiation

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NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>
 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Broccoli and/or *Brassica oleracea var. italica* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/ antioxidants/sulforaphane/glucosinolate/isothiocyanate/cooking]

12. CABBAGE A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Wrapped in big hug. Cabbage is a big ball of mood-boosting vitamin C.
- Red, white or green. Any kind of cabbage will crisp up your mood – they contain folate.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie cabbage.

Cabbage:

- ✓ Rich in vitamin C – uplift mood
- ✓ Source of folate – combats tiredness
- ✓ Source of fibre – happy gut
- ✓ Contains polyphenols – antioxidant protection
- ✓ Contains potassium – nerve function

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Cabbage fun facts:

- Cabbage has been cultivated for longer than almost any other vegetable on record. It originated in Shensi Province, China, sometime around 4,000 B.C.
- Red cabbage makes an excellent all-natural food dye (thanks to red/purple anthocyanin pigment), perfect for rainbow cakes.
- The heaviest cabbage ever grown weighed 62.71kg!¹
- Sauerkraut is pickled (fermented) cabbage – a source of probiotic bacteria from the fermentation process and good for the gut. Even Hippocrates described sauerkraut as a medicinal food.²
- Often called a windy vegetable, cabbage contains natural sulfur compounds which give cabbage its distinct flavour and aroma. Quick cooking methods lessen the pungency.³
- Instead of a rice paper roll make a cabbage leaf roll. Simply load up the big outer leaf with noodles and veggies and voila, a kid-friendly cabbage paper roll.

NUTRITION INFORMATION**

Serving size: 75g (1/2 cup raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	68g		90g
Energy	76kJ	1%	101kJ
Protein	1.3g	3%	1.7g
Total fat	0.1g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	2.0g	1%	2.6g
Sugars	1.3g	1%	1.7g
Dietary fibre	2.0g	7%	2.7g
Sodium	13.3mg	1%	17.7mg
Potassium	264mg		352mg
Folate eq	35.3ug	18%	47ug
Vitamin C	40mg	100%	53.3mg
Total polyphenols^	138mg GAE		184mg GAE
Beta-carotene eq	24ug		32ug
Anthocyanins^^ (red cabbage)	85mg		113mg

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

**average of white, green and red cabbages

"<" means less than

GAE means Gallie Acid Equivalents

References for website:

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NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

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<https://pubmed.ncbi.nlm.nih.gov/16719536/>

SUBSTANTIATION FOR CABBAGE

Individual consumer friendly nutrient content and permitted general level health claims:

- With just one serve of cabbage you can kick your vitamin C goals for the day. Half a cup contains 100% of this mood-boosting nutrient to keep you feeling happy.
- Add half a cup of cabbage to your salads or stir fries. You'll get 18% of your daily folate needs, a sure way to combat tiredness.
- Happy gut equals happy you. And that's exactly what half a cup of cabbage will give – 2g of fibre to keep those gut bugs happy.
- Red, white and green cabbage all contain polyphenols, an important antioxidant to protect your brain and body cells from free radical damage. Red cabbage contains red/purple antioxidant anthocyanin.
- Half a cup of raw cabbage contains 264mg of potassium – a mineral needed for a healthy nervous system.

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as cabbage as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables, such as cabbage, is good for brightening your mood, brain function, psychological wellbeing and happiness.

NUTRITION INFORMATION**

Serving size: 75g (1/2 cup raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	68g		90g
Energy	76kJ	1%	101kJ
Protein	1.3g	3%	1.7g
Total fat	0.1g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	2.0g	1%	2.6g
Sugars	1.3g	1%	1.7g
Dietary fibre	2.0g	7%	2.7g
Sodium	13.3mg	1%	17.7mg
Potassium	264mg		352mg
Folate eq	35.3ug	18%	47ug
Vitamin C	40mg	100%	53.3mg
Total polyphenols^	138mg GAE		184mg GAE
Beta-carotene eq	24ug		32ug
Anthocyanins^^ (red cabbage)	85mg		113mg

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

**average of white, green and red cabbages

"<" means less than

GAE means Gallic Acid Equivalents

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Crispy, crunchy cabbage is a *Brassica* vegetable like broccoli, bok choy and Brussel sprouts. Green leafy veg have been identified as must-have mood busting vegetables. Here's why...

Healthy diet recommendations around the world emphasise a diet rich in plant foods including vegetables such as cabbage, fruit and nuts. A study in young adults found higher fruit and vegetable consumption predicted greater feelings of engagement, curiosity, creativity and purpose in life.¹

Further research has found eating more fruit and vegetables is linked to a lower incidence of mental disorders, including lower rates of depression, perceived stress, and negative mood. Fruit and veg eaters also have a higher likelihood of optimal mental states, such as greater happiness, positive

mood, life satisfaction and social and emotional “flourishing” - feelings of meaning, purpose, and fulfilment in life. The top 10 raw foods related to better mental health included dark leafy greens – such as a savoy cabbage.²

A review of 61 studies analysing the link between fruit and vegetable intake and mental health in adults found a high total intake of fruit and vegetables (and specifically green leafy vegetables) may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms.³

A worksite health promotion initiative that encouraged employees to eat a healthy vegetable-based diet resulted in significant improvements in their sleep quality, quality of life, and depressive symptoms. They were given the acronym ‘G-BOMBS +T’ to remind them what to eat, and the letters stood for **Greens** - Beans, Onions, Mushrooms, Berries, Seeds and nuts + Tomatoes.⁴
Gotta love a good acronym!

Colourful vegetables are also a key component of a healthy diet and cabbage comes in red, white and green varieties. These gorgeous colourful pigments are due to natural plant chemicals such as chlorophyll (green and white cabbages) and anthocyanin (red purple cabbage). Anthocyanins have been researched for their positive impact on brain health, by improving cognitive performance and memory.^{5,6} A research study using mice found that red cabbage juice had a protective effect on oxidative stress in the brain.⁷ Cooking can significantly reduce levels of anthocyanins in vegetables such as red cabbage although shorter cooking times in small amounts of water helps retain nutrients.⁸ Think steaming, microwaving and stir frying.

Cabbage also contains isothiocyanates which show protective effects against cardiovascular disease, inflammatory disorders and brain degenerative diseases.⁹

A few studies have analysed the vegetable group separately and found people enjoying higher amounts of vegetables had an 18% lower risk of experiencing symptoms of depression.¹⁰ Other researchers found the days when more vegetables are eaten means enhanced psychological wellbeing.¹² On days when study participants consumed 0.15 more portions of vegetables (and 0.11 more portions of fruit), they experienced higher positive affect, which included feeling calmer, happier, and more energetic.¹²
For older people higher long term vegetable intake has been linked with better cognition and lower information processing speed after five years. In particular cabbage were associated with better cognitive function.¹³

Now wouldn’t we all like to feel that and all it takes is a few more bites of vegetables each day such as cabbage.

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^^Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem.* 2006;54(11):4069-4075. doi:10.1021/jf060300I <https://pubmed.ncbi.nlm.nih.gov/16719536/>

SEARCH TERMS USED FOR PUBMED: Cabbage or *Brassica oleracea* and review and diet and [mood/psychological wellbeing/ optimism/ brain function/ cognition/]

13. CAPSICUM (RED) A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Paint the town red! Red capsicum is bursting with vitamin C to boost your mood.
- Pep up your day with red peppers. They contain folate to reduce tiredness.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Aussie /Australian red capsicum.

Red Capsicum:

- ✓ Rich in vitamin C – mood enhancer
- ✓ Rich in vitamin E – antioxidant protection
- ✓ Contains folate – minimise fatigue
- ✓ Source of vitamin B6 – beat tiredness
- ✓ Source of niacin – psychological wellbeing
- ✓ Contains polyphenol – natural antioxidants
- ✓ Contains beta-carotene – antioxidant protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage).

Capsicum fun facts:

- Believe it or not red, green and yellow capsicum are all the same type of vegetable but just at different stages of ripeness. Green are unripe, red are fully ripe, with yellow in between the two.
- Capsicums are packed with antioxidants. Capsanthin is a powerful antioxidant that gives red pepper its brilliant colour.^{1,2} The amount of capsanthin can vary from 19-400mg per 100g, depending on stage of ripeness.³
- Red capsicum contains beta-carotene and other carotenoids that keep your eyes healthy.⁴ Beta-carotene gets converted to vitamin A in the body, an essential nutrient for good eye health.^{5,6}
- Capsicums are also known as peppers in some countries. They are the only member of the pepper family that does not produce capsaicin, a chemical that can cause a strong burning sensation when it comes in contact with your tongue like chilli. That's why some people refer to red capsicum as a sweet pepper.
- You can enjoy red capsicum at any stage of development. However, the riper the fruit the greater the concentration of vitamin C and carotenoids, so enjoy them at their ripest to reap all the health benefits.
- Red capsicum is a key ingredient in kimchi, a popular spice fermented cabbage with probiotic health benefits.

NUTRITION INFORMATION

Serving size: 75g (1/3 capsicum raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	69g		92g
Energy	86kJ	1%	118kJ
Protein	1.3g	3%	1.7g
Total fat	0.2g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	3g	1%	4g
Sugars	3g	3%	4g
Sodium	1.5mg	<1%	2.0mg
Vitamin B6	0.2mg	12%	0.3mg
Niacin eq	1.0mg	10%	1.4mg
Folate eq	39ug	20%	52ug
Vitamin C	129mg	323%	172mg
Vitamin E	2.6mg	26%	3.5mg
Total polyphenols^	191mg GAE		255mg GAE
Beta-carotene eq	1200ug		1470ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

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<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR CAPSICUM

Individual consumer friendly nutrient content and permitted general level health claims:

- Red capsicum is your best friend when it comes to good mood effects. With more than 300% of your daily vitamin C needs in one serve, there is no better way to brighten your day.
- Feeling tired? Munch on crisp pieces of red pepper as just 75g provides 20% of your daily folate needs and will help keep tiredness at bay.
- A third of a red capsicum (75g) contains 26% of your daily vitamin E needs. Vitamin E is a natural antioxidant that protects body cells.
- Add 75g of red capsicum to your daily diet to prevent fatigue. You'll get 12% of your daily vitamin B6 needs which is needed for energy metabolism and helps to reduce fatigue.
- A great way to get a positive outlook on life is with 75g of red capsicum, which provides 10% of daily niacin needs and supports psychological wellbeing.
- Red capsicums contain 190mg of polyphenols - powerful antioxidants to protect body cells.
- Beta-carotene found in red capsicum is another powerful antioxidant that protects cells throughout the body with just under 1100ug per 75g serve.

NUTRITION INFORMATION

Serving size: 75g (1/3 capsicum raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	69g		92g
Energy	86kJ	1%	118kJ
Protein	1.3g	3%	1.7g
Total fat	0.2g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	3g	1%	4g
Sugars	3g	3%	4g
Sodium	1.5mg	<1%	2.0mg
Vitamin B6	0.2mg	12%	0.3mg
Niacin eq	1.0mg	10%	1.4mg
Folate eq	39ug	20%	52ug
Vitamin C	129mg	323%	172mg
Vitamin E	2.6mg	26%	3.5mg
Total polyphenols^	191mg GAE		255mg GAE
Beta-carotene eq	1100ug		1470ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables such as red capsicum is good for brightening your mood, brain function, psychological wellbeing and happiness.

Subcategory COOKING claim:

- Enjoy cooked red capsicums. Cooking together has positive effects on wellbeing and quality of life.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Crisp and incredibly sweet, red capsicum, like a lady in red, will keep you in a good mood and dancing all night. Here's why....

Healthy diet recommendations around the world emphasise a diet rich in plant foods including vegetables, fruit and nuts. A study in young adults found higher fruit and vegetable consumption predicted greater feelings of engagement, curiosity, creativity and purpose in life.¹

Further research has found eating more fruit and vegetables is linked to a lower incidence of mental disorders, including lower rates of depression, perceived stress, and negative mood. Fruit and veg eaters also have a higher likelihood of optimal mental states, such as greater happiness, positive mood, life satisfaction and social and emotional "flourishing" - feelings of meaning, purpose, and fulfilment in life.²

A review of 61 studies analysing the link between fruit and vegetable intake and mental health in adults found a high total intake of fruit and vegetables may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms.³

A few studies have analysed the vegetable group separately and found people enjoying higher amounts of vegetables had an 18% lower risk of experiencing symptoms of depression.⁴ Other researchers found the days when more vegetables are eaten means enhanced psychological wellbeing.⁵ On days when study participants consumed 0.15 more portions of vegetables (and 0.11 more portions of fruit), they experienced higher positive affect, which included feeling calmer, happier, and more energetic.⁵

Capsicum is a versatile vegetable that can be enjoyed raw or cooked. Compared to raw fruit and vegetables, cooking can increase the bioavailability of some nutrients, allowing better absorption by your body, specifically beta-carotene which is found in red capsicum.⁶ Although avoid cooking in water (such as boiling) as the vitamin C in capsicum is water soluble and can be lost when the cooking water is discarded.

Speaking of beta-carotene, it is one of the many carotenoids found in red peppers and they all work together as efficient free radical scavengers to protect body cells.^{7,8} This antioxidant activity increases with advanced stages of ripening as more carotenoids are made by the plant.⁹ The beta-carotene antioxidant specifically has been linked to higher levels of optimism.¹⁰ So go ahead and enjoy these red beauties raw or cooked and reap the good mood feels.

Cooking itself can promote positivity, as it requires mastering a number of skills that exercise the brain and require heightened cognition. Mastering these skills can lead to improved mood, self-confidence, as well as self-awareness.¹¹ Sweet red peppers (capsicum) are available all year round in Australia and can be baked, roasted, stuffed, grilled and stir-fried. So get cooking with capsicums today!

References for substantiation

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 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Red capsicum and *Capsicum annuum* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

14. CARROT A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Get to the root of the problem with carrots/ Carrots: they're rootin' for ya - a source of folate for psychological wellbeing.
- Carrot, not the stick! Carrots offer you folate to beat fatigue.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie carrots.

Carrot:

- ✓ Source of folate – psychological wellbeing
- ✓ Contains beta-carotene – the orange coloured antioxidant
- ✓ Source of fibre – happy gut
- ✓ Contains potassium – steady nerves

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Carrot fun facts:

- Did you know carrots grown in the 7th century in Afghanistan were red, black, yellow, white and purple in colour? The Dutch first cultivated orange carrots.¹
- Carrot seeds reached Australia on the first fleet in 1788¹ and now they are the most consumed vegetable in Australia.²
- Carrots are delicious raw, or cooked any way you like. Raw carrot sticks are perfect for dipping or grating into salads. Carrots can be honeyed, roasted, steamed, microwaved or stir-fried.
- Did you know if you eat an extraordinarily large amount of carrots or carrot juice over time your skin can turn yellow/orange? Called betacarotenosis - beta-carotene is the orange coloured carotenoid pigment.³
- Although research has shown people are more attracted to those with more carotenoids in their skin!^{4,5}
- During WWII the British spread the rumour that their pilots ate lots of carrots and that's why they flew so well. In fact that had the new radar technology!⁶
- Myth, busted: While the beta-carotene in carrots does support eye health, carrots will only help you see in the dark if you're deficient in vitamin A (this causes night blindness but is uncommon).⁷ It's probably more important to know that nobody has ever gone blind looking at the bright side of life!

NUTRITION INFORMATION

Serving size 75g [half a large carrot raw]

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	67g		89g
Energy	110kJ	1%	147kJ
Protein	0.5g	1%	0.6g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	5g	2%	6.6g
Sugars	4.7g	5%	6.2g
Dietary fibre	2.6g	10%	3.4g
Sodium	37mg	2%	49mg
Potassium	200mg		264mg
Folate eq	25.5ug	13%	34ug
Total polyphenols^	34mg GAE		45mg GAE
Beta-carotene eq	6080ug		8100ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ
GAE means Gallic Acid Equivalents

References for website:

- 1 <https://www.horticulturetrade.com.au/vegetable-news/carrot/111-carrot>
- 2 <https://ausveg.com.au/media-releases/top-10-most-popular-fresh-vegetables-revealed/>
- 3 <https://en.wikipedia.org/wiki/Carotenosis>
- 4 Ip FW et al. Carotenoid skin colouration enhances face and body attractiveness: A cross-cultural study. *Q J Exp Psychol (Hove)*. 2019 Nov;72(11):2565-2573. <https://pubmed.ncbi.nlm.nih.gov/31035862/>
- 5 Whitehead RD et al. You are what you eat: within-subject increases in fruit and vegetable consumption confer beneficial skin-color changes. *PLoS One*. 2012;7(3):e32988. 7. <https://pubmed.ncbi.nlm.nih.gov/22412966/>

- 6 <https://www.smithsonianmag.com/arts-culture/a-wwii-propaganda-campaign-popularized-the-myth-that-carrots-help-you-see-in-the-dark-28812484/>
- 7 <https://www.scientificamerican.com/article/fact-or-fiction-carrots-improve-your-vision/>

NIP nutrient composition database references

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR CARROT

Individual consumer friendly nutrient content and permitted general level health claims:

- Folate is a B-vitamin required for normal psychological function to reduce tiredness and fatigue. Half a large carrot provides 13% of the daily recommended amount of folate.
- Carrots are a deep orange colour due to the presence of beta-carotene, an antioxidant that protects cells throughout the body. Half a large carrot contains just over 6000ug of beta-carotene.
- Carrots are a source of fibre with nearly 3g of fibre in a 75g serve. Fibre is needed for a healthy microbiome that supports optimal gut health.
- Carrots contain potassium for steady nerves with 200mg in ½ a large carrot.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as carrots, as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLES:

- A healthy, varied diet with a variety of colourful vegetables such as carrots is good for brightening your mood, brain function, psychological wellbeing and happiness.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Hot, cold or honeyed, cut in rounds or sticks, grated or stripped carrots are such a family favourite veggie. Here's why we should all eat more carrots to support brain function, psychological wellbeing and mood.

NUTRITION INFORMATION

Serving size 75g [half a large carrot raw]

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	67g		89g
Energy	110kJ	1%	147kJ
Protein	0.5g	1%	0.6g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	5g	2%	6.6g
Sugars	4.7g	5%	6.2g
Dietary fibre	2.6g	10%	3.4g
Sodium	37mg	2%	49mg
Potassium	200mg		264mg
Folate eq	25.5ug	13%	34ug
Total polyphenols^	34mg GAE		45mg GAE
Beta-carotene eq	6080ug		8100ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

GAE means Gallic Acid Equivalents

Interesting compounds in carrots

Antioxidants

Carrots have high levels of beta-carotene which give them their deep orange colour. A study in middle aged women found those who ate higher amounts of both alpha- and beta-carotene were less likely to report symptoms of depression.¹

Carotenoids are especially abundant in yellow-orange fruit and vegetables and have several health benefits. Firstly, they act as precursors to vitamin A (called pro-vitamin A), and they also have antioxidant activity that protects cells and tissues and enhances immune function.²

The brain is considered highly susceptible to oxidative stress, or the imbalance between the production of pro-oxidative reactive molecules and counteracting antioxidants. This 'redox imbalance' is implicated in psychological disorders such as depression, anxiety and emotional stress as well as degenerative diseases of the brain.³

Having higher intakes of beta-carotene is associated with better cognitive function in older people and the association is stronger for food sources than supplements.⁴

Dietary fibre

The scientific evidence to date support the role of the gut microbiome (the trillions of microbial organisms living in the human gut) in regulating emotion in the brain. The consumption of a diet high in fibre, polyphenols, and healthy unsaturated fats (such as those in avocado, olives, extra virgin olive oil and nuts) can promote microbes that produce anti-inflammatory compounds.⁵

Diets low in fibre can increase the risk of disturbances in gut bacteria and associated reductions in psychological wellbeing, which in turn can induce poor stress response behaviour and mood. Diets high in fibre can improve microbiota health to positively impact psychological wellbeing. Short Chain Fatty Acids (SCFA) such as butyrate and propionate directly affect brain physiology and behaviour by reducing brain inflammation and managing overall brain maintenance.⁶

Fruit and vegetables, mental health, psychological wellbeing and mood

A systematic review of 17 studies found an association between higher fruit and vegetable intake and better mental health in adolescents. The components of mental health assessed included health-related quality of life, mental health status, happiness and self-esteem as well as anxiety, stress and distress and depressive symptoms. The strongest benefits were found for green vegetables, yellow vegetables (such as carrots) and fresh fruit.⁷

People who eat more fruit and vegetables have a lower incidence of mental disorders, including lower rates of depression, perceived stress, and negative mood. And they also have a higher likelihood of optimal mental states, such as greater happiness, positive mood, life satisfaction and socio-emotional "flourishing" - feelings of meaning, purpose, and fulfilment in life. The top 10 raw foods related to better mental health included carrots.⁸

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Carrot and/or *daucus carota* and review and diet and [mood/psychological wellbeing/ optimism/ brain function/ cognition/beta-carotene]

15. CAULIFLOWER A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Cauli will keep you jolly thanks to vitamin C.
- Feel the power with cauliflower. Contains folate to beat fatigue.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Aussie /Australian cauliflower.

Cauliflower:

- ✓ Rich in vitamin C
- ✓ Source of folate
- ✓ High moisture content – helps hydration

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Cauliflower fun facts:

- Mark Twain once described cauliflower as “a cabbage with a cauliflower education”, and a fully-grown cauliflower is certainly an impressive sight. Its swollen head consists of tiny white flowers known as the curd.
- Cauliflower has become very popular in recent years and can be used as a pizza base, a rice replacer as well as cut into large slices and served as cauliflower steak as featured in the most recent season of Masterchef Australia.¹
- Cauliflower belongs to the plant species called *Brassica oleracea*. This species includes other such as kale, broccoli, and Brussels sprouts.
- Cauliflowers contain mustard oils, natural chemicals that impart flavour and break down to smelly sulphur-compounds when the cauliflower is heated. The longer cauliflower is cooked, the worse it will smell so stick to quick cooking methods like steaming and microwaving.
- Did you know that cauliflower comes in three eye-catching colours – orange, purple and green? The purple colour is due to the presence of antioxidant anthocyanin², and when it is cooked, it turns green.
- A head of cauliflower goes a long way; don’t ditch the stems and leaves as they’re completely edible and quite tasty too. The stem can be chopped up and used together with the florets, while the leaves can be included in soup and salads.
- Romanesque cauliflower has caught the attention of mathematicians for its distinct fractal dimensions. One of the fractal properties of cauliflower is that every branch, or “module”, is similar to the entire cauliflower.³

NUTRITION INFORMATION

Serving size: 75g (1/2 cup boiled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	69g		92g
Energy	80kJ	1%	107kJ
Protein	1.5g	3%	2.0g
Total fat	0.2g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	2.6g	1%	3.4g
Sugars	2.2g	2%	2.9g
Sodium	30mg	1%	40mg
Folate eq	28.5ug	14%	38ug
Vitamin C	15mg	38%	20mg
Total polyphenols^	43mg GAE		57mg GAE
Anthocyanins^^ (purple only)	59mg		78mg

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

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1. <https://10play.com.au/masterchef/recipes/roasted-cauliflower-with-cashew-tarator-harissa-and-fried-chickpeas/r200330qyzpn>
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NIP nutrient composition database references

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SUBSTANTIATION FOR CAULIFLOWER

Individual consumer friendly nutrient content and permitted general level health claims:

- The vitamin-C rich cauliflower florets in will power up a good mood. They contain 38% of your daily vitamin C requirements – a key nutrient for psychological function.
- Whether its cauliflower rice, pizza bases or even steaks, enjoy half a cup of cooked cauliflower and keep tiredness at bay with 14% of your daily folate needs in every serve.
- Cauliflower is 92% moisture and can contribute to body water to help keep you well hydrated.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as cauliflower, as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables, such as cauliflower, is good for brightening your mood, brain function, psychological wellbeing and happiness.

Subcategory COOKING claim:

- Versatility is the name of the game when it comes to cauliflower. From a cauliflower rice alternative to salads, pizza bases and steaks, there are so many to enjoy cooked cauliflower. Cooking has positive effects on wellbeing and quality of life.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

This versatile veg is delicious in so many way, and its flavour acts like a canvas for so many different food combinations. The cooking method however can affect the nutrient retention and flavour. Research has found that steaming, stir-frying and microwaving are the best methods to retain the key nutrients in cauliflower, specifically health-promoting polyphenol compounds and vitamin C. These nutrients are commonly found in the *Brassica* vegetable family along with broccoli, kale and cabbage.¹ Cooking requires integration of cognitive, physical, and socio-emotional processes. Learning to cook involves the mastery of skills, which might explain why cooking can promote positive mood, self-

NUTRITION INFORMATION

Serving size: 75g (1/2 cup boiled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	69g		92g
Energy	80kJ	1%	107kJ
Protein	1.5g	3%	2.0g
Total fat	0.2g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	2.6g	1%	3.4g
Sugars	2.2g	2%	2.9g
Sodium	30mg	1%	40mg
Folate eq	28.5ug	14%	38ug
Vitamin C	15mg	38%	20mg
Total polyphenols^	43mg GAE		57mg GAE
Anthocyanins^^ (purple only)	59mg		78mg

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

confidence, and self-esteem.² A population-based survey of 8,500 adolescents in New Zealand, found self-reported cooking ability was positively associated with better family connections and greater mental wellbeing.³

A study examined the influence of 10 weeks of a weekly 90-minute cooking program (*Jaime Oliver's Ministry of Food*) on cooking skills and nutritional outcomes in Australian adults. Researchers found a statistically significant difference in self-esteem scores (Rosenberg Global Self Esteem Scale) in members watching the program after 10 weeks. In qualitative interviews 6 months after the study, participants who completed the intervention reported that the cooking program contributed to feelings of accomplishment and confidence.⁴ So the bottom line - get cooking with cauli for a healthy mind and body.

A large review of 61 different studies found a high intake of vegetables, as well as fruit, in adults promotes higher levels of optimism and self-efficacy – confidence that you can achieve what you set out to achieve. These fruit and veg eaters also had less psychological distress and the research clearly shows that fruit and vegetables have a positive influence on mental health. With the wide versatility and popularity of cauliflower, it's easy to include it in every-day meals to help meet the recommended 5 serves of vegetables everyday.⁵

A study in young adults found higher fruit and vegetable intake led to greater engagement, curiosity, creativity and purpose in life. On days the participants ate more fruit and vegetables they reported greater wellbeing, curiosity and creativity compared to days they ate less.⁶ So whether it's the florets, stem or leaves, get cooking cauliflower to reach this higher life purpose.

An Australian study assessing the food diaries of 12,385 Australian adults found if you ate higher intakes of fruit and vegetable you were more likely to be happier and have more life satisfaction and wellbeing. Just looking at those eating the highest amount of fruit and vegetables (8 portions a day) over a two year period - their increase in life satisfaction was equal to the mood boost you would get if moving from unemployment to employment.⁷

This popular and versatile brassica vegetable has so many good things going for it. Roasted, fried, steamed or simply eaten as a raw snack, cauliflower has so much flavour potential and packs a solid nutrition punch to keep you feeling happy and healthy.

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

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SEARCH TERMS USED FOR PUBMED: Cauliflower and *Brassica oleracea* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

16. CELERY A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Let's celery-brate! - Keep those nerves steady with the potassium in celery, which helps to maintain the nervous system.
- Don't celery yourself short. The polyphenols in celery add flavour but they also shield body cells from damage and care for your mind and mood.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie celery.

Celery:

- ✓ Contains potassium – steady nerves
- ✓ Contains polyphenols – brain protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Celery fun facts:

- Did you know garlands of celery were given to winners of ancient Greek athletic games?¹
- Don't forget to use celery leaves as well. They're nutritious and great in salads and soups.
- Celery, along with onion and carrots makes up the French base for sauces and soups called *mirepoix*.¹
- Celery salt is a mixture of salt and dried celery seeds.¹
- Celery seeds were used as a traditional medicine for anxiety.²
- Celery is the most widely used plant in traditional medicine.³
- A popular diet myth is celery takes more energy to digest than it contains or has 'negative calories'. This is incorrect, although the calorie/kilojoule content of celery is low.
- For a quick, easy and tasty snack, top a stick of celery with nut butter and dried fruit. For example, almond butter and sultanas (try cream cheese for a nut-free option).

NUTRITION INFORMATION

Serving size: 75g (2 stalks raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	71g		95g
Energy	47kJ	1%	62kJ
Protein	0.5g	1%	0.6g
Total fat	0.1g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	1.7g	<1%	2.2g
Sugars	0.9g	1%	1.2g
Sodium	74mg	3%	98mg
Potassium	200mg		267mg
Total polyphenols^	32mg GAE		42mg GAE
Beta-carotene	44ug		58ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

- 1 <https://en.wikipedia.org/wiki/Celery>
- 2 <https://mobile-cuisine.com/did-you-know/celery-fun-facts/#:~:text=April%20is%20National%20Fresh%20Celery,Romans%20used%20celery%20as%20aphrodisiac.>
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<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR CELERY

Individual consumer friendly nutrient content and permitted general level health claims:

- Two celery stalks contains 200mg of potassium that helps maintain the nervous system.
- The polyphenols in celery add flavour but they also protect body cells against damage from oxidation. A 75g serve of celery contains 32mg of antioxidant polyphenols.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as celery, as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables, such as celery, is good for brightening your mood, brain function, psychological wellbeing and happiness.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 75g (2 stalks raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	71g		95g
Energy	47kJ	1%	62kJ
Protein	0.5g	1%	0.6g
Total fat	0.1g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	1.7g	<1%	2.2g
Sugars	0.9g	1%	1.2g
Sodium	74mg	3%	98mg
Potassium	200mg		267mg
Total polyphenols^	32mg GAE		42mg GAE
Beta-carotene	44ug		58ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

You could say in a culinary sense, it all starts with celery. Whether it be the beginnings of a soup or stew, the base for a delicious dip or topping, or just guilt-free snacking, celery has much to offer as vegetable on your plate. And there's lots to celery-brate in terms of its benefits on body, mind and mood too.

Celery has a whole bunch of helpful compounds

Celery is well known as a seasoning vegetable for its flavour and as a traditional medicine. Both these indicate an array of natural phytochemicals present. The phytochemical compounds in celery include polyphenols such as flavonoids, and alkaloids. The major phenolic acids include caffeic acid, *p*-coumaric acid and ferulic acid, while the flavonoids include apigenin, luteolin, and kaempferol. All these compounds contribute to powerful antioxidant effects of celery, and anti-inflammatory effects have also been shown.¹ The antioxidant power of celery is important for mind and mood because oxidative stress in the brain is implicated in depression, anxiety and emotional stress.² The anti-inflammatory ability of celery is important because inflammation is also implicated in the development of depression and polyphenols may promote resilience to emotional stress.³

Celery helps with vascular health

Celery has also been identified as one of a group of vegetables with great potential for preventing and managing cardiovascular diseases.⁴ This is helpful to mental health and mood as well. Several large population studies have demonstrated that cardiovascular risk factors, aside for contributing

substantially to the risk of stroke, negatively influence overall brain health.⁵ There are links between coronary heart disease and mental disorders, and they may share common causes.⁶

Why adding celery to your plentiful platter of plant foods will pay off

Celery is best enjoyed within a diet rich in plant foods because it provides variety and pleasure, but it also provides you with a range of beneficial components for your body and mind. The more fruit and vegetables you eat, the happier you will be. A British study found the optimal amount was 7 serves a day.⁷ The health benefits of fruit, vegetables, and other plant foods on psychological wellbeing are due to the many bioactive compounds (such as phytochemicals and antioxidants) and other nutrients in whole foods working together to deliver a healthy brain function.⁸ And not only do they keep your brain healthy but they help you look on the bright side, with several large studies finding people who eat more fruit, vegetables and nuts are more optimistic.^{9,10}

This is supported by a large systematic literature review of 61 studies, analysing the association between fruit and vegetable intake and mental health in adults. Researchers found a high total intake of fruit and vegetables (and some of their specific subgroups including green leafy vegetables) may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms. The authors concluded that fruit and/or vegetables have a positive influence on mental health and the general recommendation to consume at least 5 portions of fruit and vegetables a day may be beneficial for mental health.¹¹

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NIP nutrient composition database references

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Celery and/or *Apium graveolens* and mood/brain

17. CHERRY A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Eat a cherry to feel merry thanks to vitamin C.
- Get your summer energy from cherries – full of natural fruit sugars.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Aussie / Australian cherries.

Cherry:

- ✓ Rich in vitamin C – good mood
- ✓ Contains natural fruit sugars – for energy
- ✓ Contains polyphenols – antioxidant protection
- ✓ Contains anthocyanin – red purple pigment antioxidant
- ✓ Contains potassium – nerve function
- ✓ Source of fibre – gut health

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage).

Cherry fun facts:

- Cherries shine through the Australian summer as the perfect healthy snack. They're sweet, refreshing, juicy and so easy to eat anywhere anytime.
- Fresh, sweet cherries are irresistible eaten just as they are. But don't forget their versatility - they add richness, colour and flavour to our cooking including both sweet and savoury recipes from sauces, chutneys and relishes to cakes, muffins, pies and tarts.
- Cherries are one of nature's true superfoods. They contain polyphenols and vitamin C, which have antioxidant and anti-inflammatory properties.¹
- The intensity of the red colour of cherries increases as the fruit ripens, as does the amounts of the polyphenol antioxidants and anthocyanins which are mostly found in the skin.²
- The Australian cherry season is quite short and only lasts about 100 days. So get your baskets ready to get picking and eating these little red morsels of nutrition goodness.
- Once picked, cherries cease to ripen, so should be consumed within four days of purchase and they last longer with the stem attached. Store cherries, loosely packed, in an airtight container in the fridge. Cherries can also be frozen, pitted, for up to six months.

NUTRITION INFORMATION

Serving size: 150g (1 cup pitted cherries raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	125g		83g
Energy	375kJ	4%	250kJ
Protein	1.2g	2%	0.8g
Total fat	0.3g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	19.4g	6%	12.9g
Sugars	16.4g	18%	10.9g
Dietary fibre	2.3g	8%	1.5g
Sodium	0mg	0%	0mg
Potassium	345mg		230mg
Vitamin C	28.5mg	71%	19.0mg
Total polyphenols^	389mg GAE		259mg GAE
Beta-carotene eq	84ug		56ug
Anthocyanins^^	183mg		122mg

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

1. Kelley DS, Adkins Y, Laugero KD. A Review of the Health Benefits of Cherries. *Nutrients*. 2018;10(3):368. doi:10.3390/nu10030368 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5872786/>
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NIP nutrient composition database references

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem.* 2006;54(11):4069-4075. doi:10.1021/jf060300l <https://pubmed.ncbi.nlm.nih.gov/16719536/>

SUBSTANTIATION FOR CHERRY

Individual consumer friendly nutrient content and permitted general level health claims:

- One delicious cup of cherries provides 71% of our daily needs for vitamin C, which helps to keep up a good mood all summer long. Vitamin C has a role in normal psychological function.
- The sweetness of cherries comes from their natural fruit sugars, about 16g in a 150g serve, making them the ideal snack to fuel summer fun.
- Cherries are bursting with polyphenols, the ultimate antioxidant nutrient to protect body cells from free radical damage – 390mg in 150g.
- Cherries are vibrantly red thanks to anthocyanins. A unique type of flavonoid antioxidant that defends body cells.
- The fibre in cherries is perfect for helping to keep our insides healthy and regular. One serve of cherries (150g) provides just over 2g of fibre, which is 8% of our daily needs.
- Potassium is essential for healthy nerves and one cup of cherries provides 345mg.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory FRUIT claim:

- Sweet! Feel good with cherries. A healthy, varied diet high in fruit, such as cherries, is good for mental wellbeing, positive mood and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Cherries evoke memories of warm summer days and carefree happy holidays, and bring out the playfulness remember wearing cherry earrings? These happy feelings may be due to flavonoid antioxidants found in cherries.

Cherry flavonoids have been studied for their brain health properties. Flavonoids have been shown to affect the brain positively. It's thought a number of pathways work together to improve cognition and prevent degeneration of the brain.¹

NUTRITION INFORMATION

Serving size: 150g (1 cup pitted cherries raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	125g		83g
Energy	375kJ	4%	250kJ
Protein	1.2g	2%	0.8g
Total fat	0.3g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	19.4g	6%	12.9g
Sugars	16.4g	18%	10.9g
Dietary fibre	2.3g	8%	1.5g
Sodium	0mg	0%	0mg
Potassium	345mg		230mg
Vitamin C	28.5mg	71%	19.0mg
Total polyphenols^	389mg GAE		259mg GAE
Beta-carotene eq	84ug		56ug
Anthocyanins^^	183mg		122mg

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

A 12-week randomised controlled trial in older adults with mild to moderate Alzheimer-type dementia, drinking 200ml of cherry juice a day showed significant improvement in verbal fluency and verbal learning and memory.² The neuro-protective effects of the cherry red coloured anthocyanins include protection against inflammation, enhancement of existing neuron function, increased blood flow to the brain and creation of nerve pathways in areas of the brain that are associated with cognition.³

Improvement in systolic blood pressure has also occurred with both acute and longer-term treatments with cherry juice, and this may explain how cognitive decline is prevented.⁴

These results indicate that flavonoid-rich cherries may positively influence cognition and may be beneficial for the prevention and possibly treatment of dementia.

There are a number of studies that have shown beneficial effects of cherries on mood improvement. These studies found that cherries and cherry-products reduced anxiety and had a positive effect on mood (measured in terms of family relationships, frame of mind and fitness). These findings were especially notable in the middle-aged and elderly participants.^{5,6}

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SEARCH TERMS USED FOR PUBMED: Cherries and/or *Prunus avium* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

18. CHESTNUT A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Chestnuts – the clever, cheerful choice with brain busting vitamin C.
- Chestnuts - the cheerful choice with mood boosting folate.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie chestnuts.

Chestnut:

- ✓ Source of vitamin C – brain action
- ✓ Source of folate – mood booster
- ✓ Source of fibre – gut health
- ✓ Contains carbohydrates – for energy
- ✓ Contains polyphenols – antioxidant protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Chestnut fun facts:

- Chestnuts are more like grains or potatoes than nuts – they contain more carbohydrate and less fat.
- Chestnuts are the only nut to contain vitamin C.^
- Chestnut meal is a great gluten-free flour for baking pancakes, bread, cakes and can be used to thicken stews, soups, and sauces.
- Chestnut can be eaten baked, boiled or roasted.
- Fresh chestnuts are available around autumn but vacuum packed, frozen and jarred chestnuts are available year round.
- Chestnuts grow inside a spikey burr.

NUTRITION INFORMATION

Serving size: 30g (4 chestnuts roasted)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	16g		52g
Energy	217kJ	3%	724kJ
Protein	1.0g	2%	3.4g
Total fat	0.2g	<1%	0.6g
Saturated fat	<1g	<1%	<1g
Total Carbohydrates	10.3g	3%	34.3g
Sugars	1.1g	1%	3.8g
Dietary fibre	2.4g	8%	8.1g
Sodium	<1mg	<1%	1mg
Folate eq	21ug	11%	70ug
Vitamin C^	7.8mg	20%	26mg
Total polyphenols^^	474mg GAE		1580mg GAE

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL

<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^ Alasalvar C, Bolling BW. Review of nut phytochemicals, fat-soluble bioactives, antioxidant components and health effects.

Br J Nutr. 2015;113 Suppl 2:S68-S78. doi:10.1017/S0007114514003729. <https://www.cambridge.org/core/services/aop-cambridge-core/content/view/DFB0B78FA7CC0345EE937F9100B920DD/S0007114514003729a.pdf/div-class-title-review-of-nut-phytochemicals-fat-soluble-bioactives-antioxidant-components-and-health-effects-div.pdf>

SUBSTANTIATION FOR CHESTNUT

Individual consumer friendly nutrient content and permitted general level health claims:

- Chestnuts – the clever choice with vitamin C for psychological wellbeing and brain function. Chestnuts are the only nut to have vitamin C - 4 chestnuts provide 20% of RDI.
- Chestnuts - the cheerful choice with mood boosting folate. Four chestnuts (30g) provide 11% of the RDI folate needed for psychological function.
- Chestnuts are a source of fibre – with 30g providing 2g of fibre for good gut health.
- Chestnuts are more like grains and potatoes than nuts. Four chestnuts (30g) contains 10g of carbohydrate fuel.
- Chestnuts contains 474mg of polyphenols for antioxidant protection.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory NUT claim:

- Nuts: Happiness in a handful. A healthy, varied diet containing a variety of nuts such as chestnuts is good for brain function and psychological wellbeing – putting you in happy mood.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 30g (4 chestnuts roasted)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	16g		52g
Energy	217kJ	3%	724kJ
Protein	1.0g	2%	3.4g
Total fat	0.2g	<1%	0.6g
Saturated fat	<1g	<1%	<1g
Total Carbohydrates	10.3g	3%	34.3g
Sugars	1.1g	1%	3.8g
Dietary fibre	2.4g	8%	8.1g
Sodium	<1mg	<1%	1mg
Folate eq	21ug	11%	70ug
Vitamin C^	7.8mg	20%	26mg
Total polyphenols^^	474mg GAE		1580mg GAE

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

The creamy, smooth texture of hot roasted chestnuts is a traditional favourite in the cooler months. A cheery addition when the skies may be grey. Nuts are well known for maintaining healthy hearts but their bold impact on the brain is something new. Nuts are linked with better brain health through better cognitive function, learning, memory, psychological wellbeing and mood.¹ Nuts will keep your cheerful, motivated and sharp.

Nuts reduce depression risk and improve quality of life

Your favourite nuts may also reduce your risk of developing depression symptoms. A Mediterranean Diet study (The SUN Study) followed just over 10,000 people for around 4 years and found those eating more fruit and nuts together had a 33% reduce risk of developing depression compared to those eating less fruit and nuts.²

An Australian Mediterranean diet study found those eating more nuts (and greater vegetable diversity) had greater reduction in depression and improved mental health scores which were sustained over 6 months.³

A Chinese study of some 13,600 people found those eating nuts at least one a week had an 18% reduction in depression risk compared to those eating nuts less than once a week.⁴

The Australian SMILES trial with 67 participants found improvements in ratings of depression after 12 weeks of a special diet which included a daily serving of nuts.⁵ The same research team also identified folate as one of key nutrients linked to lower depressive scores⁶ – a nutrient found naturally in chestnuts.

Nuts and better cognition

Next time someone says “you’re nuts!” just say thanks – eating nuts improves your brain function and cognition – your ability to process information and experiences. A review of more than 70 studies by University of South Australia researchers found a 30g handful of nuts enjoyed daily may improve mental processes such as memory, problem solving and decision making. It may be nuts’ ability to reduce inflammation and improve blood flow that’s key.⁷

Long-term higher nut intake has been linked many times with better overall cognition in older ages. Women regularly consuming a high intake of nuts had better cognition scores than those consuming fewer or no nuts. This high nut intake appeared protective by reducing cognitive aging by two years.⁸ The more nuts you eat and the longer you eat them is, the better the results. Another group found in just over 2600 adults aged 43-70 years who habitually consumed nuts over five years was significantly linked to improved cognitive function (memory, speed, flexibility) with no cognitive decline over this time either.⁹

A large group of older men (1866) undertaking cognitive tests found those eating nuts twice a week had significantly better cognitive performance than those eating nuts less than one serving a month.¹⁰

Healthy hearts = healthy brains

How nuts have this effect may have to do with the unique combination of nut nutrients such as antioxidant vitamins and minerals, and phytochemicals with antioxidant and anti-inflammatory properties. These compounds help keep hearts healthy by protecting blood vessels so may help protect brain function and its blood vessels too.⁷ Chestnuts contain a number of antioxidants including polyphenols (ellagic acid and gallic acid).^{11,12} In fact they are number 11 in a list of the top 100 food for polyphenols and number 9 for antioxidants in general.¹³

So enjoy the sweet, earthy quality of chestnuts and pair them with other autumnal flavours – game meats, mushrooms and apples.

Chestnuts can be used in many surprising ways so add a handful in your dishes:

- As a stuffing in poultry
- As a thickener for soups
- As a gluten free flour for baked goods and breads
- As a puree for decadent desserts.

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NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^ USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^ Alasalvar C, Bolling BW. Review of nut phytochemicals, fat-soluble bioactives, antioxidant components and health effects. *Br J Nutr*. 2015;113 Suppl 2:S68-S78. doi:10.1017/S0007114514003729. <https://www.cambridge.org/core/services/aop-cambridge-core/content/view/DFB0B78FA7CC0345EE937F9100B920DD/S0007114514003729a.pdf/div-class-title-review-of-nut-phytochemicals-fat-soluble-bioactives-antioxidant-components-and-health-effects-div.pdf>

SEARCH TERMS USED FOR PUBMED: Chestnuts and/or *Castanea sativa* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]



19. CUCUMBER A GOOD MOOD FOOD

WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

Be cool as a cucumber!

- Let the vitamin C in crunchy, juicy cucumbers refresh your mind and mood.
- De-stress with the clever carotenoids in cucumbers.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie cucumbers.

Cucumber:

- ✓ Source of vitamin C – psychological wellbeing
- ✓ Contains carotenoids – antioxidant protection
- ✓ Contains polyphenols – antioxidant and anti-inflammatory
- ✓ High moisture content – contribute to hydration

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Cucumber fun facts:

- Cucumber is one of those vegetables that is actually a fruit. You could call them a fregetable!
- Cucumbers are commonly pickled and are the “pickles” served on fast food burgers. Gherkins are small pickled cucumbers.¹
- Cucumber is the key ingredient of Indian raita used to cool down spicy dishes, and Middle Eastern tzatziki dip – both are made with chopped cucumber and natural yoghurt.
- The expression ‘cool as a cucumber’ is thought to be because the inside of a cucumber is significantly cooler than the temperature outside.²

NUTRITION INFORMATION

Serving size: 75g (1/2 small raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	72g		95g
Energy	38kJ	<1%	50kJ
Protein	0.6g	1%	0.8g
Total fat	<1g	<1%	<1g
Saturated fat	0g	0%	0g
Total Carbohydrates	0.9g	<1%	1.2g
Sugars	0.9g	1%	1.2g
Sodium	8mg	<1%	10mg
Vitamin C	5.3mg	13%	7mg
Total polyphenols [^]	22mg GAE		29mg GAE
Beta-carotene eq	188ug		250ug
Lutein & zeaxanthin [^]	12ug		16ug

Source: Aust Food Comp Data or [^] USDA

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

References for website:

- 1 <https://en.wikipedia.org/wiki/Cucumber>
- 2 The Fact Site. Fifteen fun facts about cucumbers. <https://www.thefactsite.com/cucumber-facts/>

NIP nutrient composition database references

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<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

[^]USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR CUCUMBER

Individual consumer friendly nutrient content and permitted general level health claims:

- Half a small cucumber (75g) contains 13% of the daily recommended amount of vitamin C, which helps support psychological function and emotional wellbeing.
- Cucumber contains several colourful carotenoid antioxidants that help protect the brain against oxidative stress – such as beta-carotene and lutein and zeaxanthin.
- Polyphenols in cucumber have antioxidant effects to maintain optimal function of the brain and nervous system.
- Cucumbers are cool because they have a high moisture content (95%) which contributes to body hydration.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as cucumber, as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Category FRUIT and/or VEGETABLE and/or NUT claim PLUS HYDRATION:

- A healthy, varied diet containing a variety of fruit, vegetables and mushrooms contributes fluids to help hydration, and maintain brain function and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables, such as cucumber, is good for brightening your mood, brain function, psychological wellbeing and happiness.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Fresh, crisp, crunchy, refreshing; you could say cucumbers are the best raw deal in town! Read on to find out more about this mouth-watering 'fregetable' and how it helps you stay cool as a cucumber.

Interesting compounds in cucumbers

Vitamin C

Vitamin C is a potent antioxidant and cucumbers are a source of Vitamin C. Fruit and vegetables such as cucumber are dietary sources of vitamin C as well as the pigment beta-carotene which are both important in the antioxidant defence of cells. Having higher intakes of these nutrients is associated with better cognitive function in older people and is stronger for food sources than supplements.¹

NUTRITION INFORMATION

Serving size: 75g (1/2 small raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	72g		95g
Energy	38kJ	<1%	50kJ
Protein	0.6g	1%	0.8g
Total fat	<1g	<1%	<1g
Saturated fat	0g	0%	0g
Total Carbohydrates	0.9g	<1%	1.2g
Sugars	0.9g	1%	1.2g
Sodium	8mg	<1%	10mg
Vitamin C	5.3mg	13%	7mg
Total polyphenols^	22mg GAE		29mg GAE
Beta-carotene eq	188ug		250ug
Lutein & zeaxanthin^	12ug		16ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Carotenoids

Colourful carotenoids such as beta-carotene and lutein and zeaxanthin both found in cucumber, have several health benefits. Firstly, beta-carotene is a precursor to vitamin A (called pro-vitamin A), and carotenoids also have antioxidant activity that protects cells and enhances immune function.²

The brain is considered highly susceptible to oxidative stress, or the imbalance between the production of pro-oxidative reactive molecules and counteracting antioxidants. This 'redox imbalance' is implicated in psychological disorders such as depression, anxiety and emotional stress as well as degenerative brain diseases.³

Polyphenols

Phenolic compounds are potent antioxidants that also show anti-inflammatory effects. They may protect against the development of cardiovascular disease and degenerative brain diseases due to aging.⁴

Chronic inflammation is a prolonged and dysregulated immune response leading to a wide variety of issues such as nervous system problems and cardiovascular diseases. Inhibiting persistent inflammation is key. Fisetin is little known flavonoid found in cucumbers has both high antioxidant capacity and anti-inflammatory effects. Fisetin has demonstrated numerous benefits including the protection of nerve cells and protection against stroke and brain tissue loss due to blocked brain blood vessels.⁵

Importance of hydration on mood

Cucumbers are juicy, containing 95% moisture that can contribute to the body's total fluids. Hydration is important for brain function, emotional wellbeing and mood. The brain contains 75% water and water loss can affect brain function.⁶ Even a small amount of body water loss (around 1%) is enough to affect cognition as dehydration affects energy production in brain cells and reduces the chemical messengers involved in learning and memory.⁷ In adults, dehydration can increase negative emotions such as anger, confusion, tension, anxiety and depression while consuming fluids can improve cognitive function and mood.⁸ Eating ½ a cucumber with around 100ml of fluid along with another four serves of veggies and two serves of fruit can contribute about 500-600ml of fluids in the diet each day.

Fruit and vegetables, mental health, psychological wellbeing and mood

A study looking at associations between fruit and vegetable intake and mental health identified cucumber among the top ten raw foods related to better mental health. People who eat more fruit and vegetables have a lower incidence of mental disorders, including lower rates of depression, perceived stress, and negative mood. And they also have a higher likelihood of optimal mental states, such as greater happiness, positive mood, life satisfaction and socio-emotional "flourishing" - feelings of meaning, purpose, and fulfilment in life.⁹

An Australian study assessing food diaries and surveys of 12,385 Australian adults found increased fruit and vegetable consumption was predictive of increased happiness, life satisfaction and wellbeing. The increase in life satisfaction from the highest increase in fruit and vegetable consumption (8 portions a day) over the period of two years was equal to the psychological gain of moving from unemployment to employment.¹⁰

So next time you're slicing a cucumber for your salad or cucumber sandwich remember even the most humble of veggies is key to health and happiness.

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 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Cucumber or *Cucumis sativus* and [mood/ psychological/ brain /cognition/antioxidants/fisetin]

20. CURRANT (DRIED) A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Be a bright spark with currants – full of energising fruit sugars to keep you buzzing.
- Antioxidant defences? Check✓ Currants contains polyphenols and anthocyanins to fight free radicals.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie Currants.

Currant:

- ✓ Contains natural fruit sugars – for energy
- ✓ Contains polyphenols – antioxidant defence
- ✓ Contains red purple pigment anthocyanin – free radical fighter
- ✓ Contains potassium – steady nerves
- ✓ Source of fibre – gut health

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Currant fun facts:

- Currants or Zante currants are a small dark grape about a quarter the size of normal grapes.
- Currants dry quickly in the sun due to their small size.
- Currants have a tangy flavour and are darker than sultanas and raisins.
- The variety was cultivated in Greece near the city of Corinth, from which it derives its name.
- The first written record was in 75AD by Pliny the Elder, who described a tiny, juicy, thick-skinned grape with small bunches.
- Not to be confused with black, red or white currants, which are berries of shrubs in the genus *Ribes*.
- Dried grapes like currants may be sticky but they do not stick to teeth for long nor cause dental caries in fact the high antioxidant content is thought to be protective as it inhibits the bacteria that causes dental caries.²⁻⁷
- Dried grapes like currants and raisins are a prebiotic (food) for probiotics (gut bacteria) and can affected the growth of certain types of good bacteria.^{8,9}
- Currants are a key ingredient in many traditional sweets e.g. currant buns, mince pies, fruit cake and Christmas pudding.

NUTRITION INFORMATION

Serving size: 30g (1.5 tb)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	5g		17g
Energy	350kJ	4%	1170kJ
Protein	0.8g	2%	2.8g
Total fat	0.2g	<1%	0.5g
Saturated fat	0g	0%	0g
Total Carbohydrates	19.5g	6%	65.1g
Sugars	19g	21%	63.2g
Sodium	14mg	<1%	46mg
Potassium	243mg		810mg
Total polyphenols^	361mg GAE		1200mg GAE
Anthocyanins^^	73mg		244mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

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NIP nutrient composition database references

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem*. 2006;54(11):4069-4075. doi:10.1021/jf060300l <https://pubmed.ncbi.nlm.nih.gov/16719536/>

SUBSTANTIATION FOR CURRANT

Individual consumer friendly nutrient content and permitted general level health claims:

- Be a bright spark with currants – full of energising fruit sugars to keep you buzzing. A 30g serve of currants contains about 20g of fruit sugars – natural brain fuel.
- Antioxidant defences? Check✓ Currants contains polyphenols and anthocyanins to fight free radicals.
- A 30g handful of sultanas contain 240mg potassium needed for a healthy nervous system.
- Currants are a source of fibre with 2g per 30g serve. Currants keep the intestinal currents flowing.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as currants, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory FRUIT:

- A healthy, varied diet high in fruit such as currants is good for mental wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 30g (1.5 tb)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	5g		17g
Energy	350kJ	4%	1170kJ
Protein	0.8g	2%	2.8g
Total fat	0.2g	<1%	0.5g
Saturated fat	0g	0%	0g
Total Carbohydrates	19.5g	6%	65.1g
Sugars	19g	21%	63.2g
Sodium	14mg	<1%	46mg
Potassium	243mg		810mg
Total polyphenols [^]	361mg GAE		1200mg GAE
Anthocyanins ^{^^}	73mg		244mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Tiny black dried currants are more tart in flavour than their sweeter cousins sultana and raisin. This may be explained by their higher antioxidant polyphenol content. Their black purple colour is due to the presence of anthocyanins which get darker as they dry.^{1,2} A test tube study found dried currants have a strong antioxidant capacity.³ Antioxidants and anthocyanins can help reduce oxidative stress and inflammation in the brain which is linked to brain degenerative disease.⁴

Traditional Persian medicine included dried grapes such as raisin in a diet to help treat Alzheimer's Disease.⁵ Polyphenol antioxidants in grape products may just help preserve brain function in animal models of depression and Alzheimer's Disease.⁶⁻¹⁰

Grape derived polyphenols like those in raisins and sultanas appear to normalise raised levels of pro-inflammatory cytokines and abnormal levels of brain derived neurotrophic factor. This helps restore impaired synaptic nerve cells that lead to depressive behaviour in animal models of stress.⁶ Similarly they may also effectively improve the learning and memory abilities of rats with Alzheimer's Disease.⁷ Raisin and sultanas have also been found to significantly raise blood antioxidant levels and promotes cognitive and motor performance in aging rats.^{8,9} A study in rabbits also found that dried currants in their diets reduced oxidative stress and atherosclerosis lesions in their arteries.¹⁰

The most abundant antioxidant polyphenols in dried grapes, like raisins and sultanas, are the flavonols, quercetin and kaempferol; and the phenolic acids, caftaric and coutaric acid. In human studies, raisins/sultanas affect certain oxidative biomarkers. In a study of 15 men over a 4 week period reviewing the antioxidant capacity and phenolic content of green Thompson seedless grapes, sun-dried raisins, and golden raisins ("sultanas") they consumed, golden raisins had the highest antioxidant capacity and phenolic content.¹¹ These compounds also reduce inflammatory markers. Thirty-four men and postmenopausal women were randomly assigned to consume 1 cup raisins a day for 6 weeks and found the raisins decreased TNF- α - an inflammatory cytokines.¹² Inflammatory plays a role in brain function decline.

Fruit in general has been shown to have mood boosting benefits. Eating fruit as a snack compared to unhealthy snacks such as chocolate or crisps, was associated with lower anxiety and emotional distress in a study of 100 students.¹³ In both adults and children increased fruit intake may improve psychological wellbeing.^{14,15} The Australian Victorian Child's Health and Wellbeing study (3,370 children) observed that children with a higher number of daily fruit servings had significantly better odds of emotional control, and problem management and relationship building skills (pro-social behaviour).¹⁵

A review of 61 studies analysing the association between fruit and vegetable intake and mental health in adults found a high total intake of fruit and vegetables promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms. The authors concluded that fruit and/or vegetables have a positive influence on mental health and the general recommendation to consume at least 5 portions of fruit and vegetables a day may be beneficial for mental health.¹⁶

Currants are often a key ingredients in baked goods such as fruit cake, currant buns and mince pies. A systematic review of 11 studies suggests that cooking may positively influence psychosocial outcomes. A positive influence on socialisation, self-esteem and quality of life. Cooking requires

integration of cognitive, physical, and socio-emotional processes, and learning to cook involves the mastery of skills, which might explain why cooking can promote positive mood, self-confidence, and self-esteem.¹⁷ A population-based survey of 8,500 adolescents in New Zealand, found self-reported cooking ability was positively associated with better family connections and greater mental wellbeing.¹⁸

Lots of smart reasons for getting back into baking with dried currants and their cousins sultanas and raisins.

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem.* 2006;54(11):4069-4075. doi:10.1021/jf060300l
<https://pubmed.ncbi.nlm.nih.gov/16719536/>

SEARCH TERMS USED FOR PUBMED: Currant/ zante currant/ Corinthian currant/ and/or *Vitis vinifera* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/ antioxidants]

21. CUSTARD APPLE A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Beautiful on the inside - folate for your emotional wellbeing.
- Custard apple comfort food - thanks to vitamin C supporting your emotional wellbeing.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/Aussie custard apples.

Custard apple:

- ✓ Loads of vitamin C – emotional wellbeing
- ✓ Source of vitamin B6 – maintain energy
- ✓ Source of folate – psychological wellbeing
- ✓ Source of magnesium – steady nerves
- ✓ Source of niacin – fight fatigue
- ✓ Source of fibre – happy gut
- ✓ Contains polyphenols – antioxidant protection
- ✓ Contains natural fruit sugars – for energy
- ✓ Low Glycemic Index (GI) – longer lasting energy

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Custard apple fun facts:

- Custard apples are named because their flesh is soft and mellow like custard.
- Custard apples are picked before they are ripe, let them ripen in your fruit bowl for 4-5 days or until the fruit 'gives' when lightly squeezed.¹
- Custard apples are delicious eaten straight out of the skin with a spoon but also make awesome smoothies.
- Did you know custard apples originated in central America and were used as traditional medicine?²

References for website:

1. <http://www.custardapple.com.au/Info-Pages/the-custard-apple.html>
2. <https://www.britannica.com/plant/custard-apple>

NIP nutrient composition database references

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^Phenol explorer Database available at URL <http://phenol-explorer.eu/contents/food/185>

Santos WN, Sauthier MC, Cavalcante DD et al. Mineral composition, nutritional properties, total phenolics and flavonoids compounds of the atemoya fruit (*Annona squamosa* L. x *Annona cherimola* Mill.) and evaluation using multivariate analysis techniques. *An Acad Bras Cienc.* 2016;88(3):1243-1252. doi:10.1590/0001-3765201620150537 <https://pubmed.ncbi.nlm.nih.gov/27598843/>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

NUTRITION INFORMATION

Serving size: 150g (1/3 custard apple raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	119g		79g
Energy	489kJ	6%	326kJ
Protein	2.1g	4%	1.4g
Total fat	0.9g	1%	0.6g
Saturated fat	0.2g	1%	0.2g
Total Carbohydrates	23.7g	8%	15.8g
Sugars	22.1g	25%	14.7g
Dietary fibre	3.8g	13%	2.5g
Sodium	6mg	<1%	4mg
Potassium	375mg		250mg
Niacin eq	1.4mg	14%	0.9mg
Vitamin B6	0.3mg	21%	0.2mg
Folate eq	30ug	15%	20ug
Vitamin C	64.5mg	161%	43mg
Magnesium	48mg	15%	32mg
Total polyphenols^	37mg GAE		25mg GAE
Flavonoids#	1.8mg QE		1.2mg QE
Beta-carotene eq	7.5ug		5ug
Glycemic Index (GI) ^^	54 (low)		

Source: Aust Food Comp Data or ^Phenol explorer database or #Santos 2016

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

SUBSTANTIATION FOR CUSTARD APPLE

Individual consumer friendly nutrient content and permitted general level health claims:

- One third of a custard apple is loaded with vitamin C - 161% of the daily recommended amount – important for your emotional wellbeing due to its effect on psychological function.
- Custard apples are a source of vitamin B6, providing 21% of the daily recommended amount in 150g. Vitamin B6 is required for maintaining energy levels.
- Scoop out 1/3 of a custard apple for 15% of the recommended daily amount of folate. Folate is needed for psychological function.
- Magnesium is important for steady nerves and normal nerve function. Custard apples are a source of magnesium, with one third of an average fruit containing 15% of the recommended daily amount.
- Custard apples are a source of niacin, with 14% of the daily recommended amount found in one third of an average fruit. Niacin is important for fighting fatigue.
- The 4g of fibre found in 150g of custard apple nurtures the microbiome for better gut health.
- The 37mg of antioxidant polyphenols in custard apples quell damaging free radicals.
- Custard apples contain natural fruit sugars with 22g of sugars in a third of a custard apple.
- Custard apple has a low to moderate glycemic index (GI=54) which means their carbs provide longer lasts energy.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as custard apples, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as custard apples is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 150g (1/3 custard apple raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	119g		79g
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Total Carbohydrates	23.7g	8%	15.8g
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Dietary fibre	3.8g	13%	2.5g
Sodium	6mg	<1%	4mg
Potassium	375mg		250mg
Niacin eq	1.4mg	14%	0.9mg
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Vitamin C	64.5mg	161%	43mg
Magnesium	48mg	15%	32mg
Total polyphenols^	37mg GAE		25mg GAE
Flavonoids#	1.8mg QE		1.2mg QE
Beta-carotene eq	7.5ug		5ug
Glycemic Index (GI) ^^	54 (low)		

Source: Aust Food Comp Data or ^Phenol explorer database or #Santos 2016

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

How can something ugly on the outside have so much beauty and goodness within? Custard apples can help you feel good inside too. While custard might be a comfort food of old, custard apples are the comfort food of today.

Helpful compounds in custard apples

Custard apples taste deliciously different with a comforting smooth texture and tropical flavour with hints of vanilla. They contain natural sugars for energy and the energy is longer lasting thanks to a lower glycemic index (GI) of 54. Their complexity on the tongue is matched by the array of phytonutrients they contain and this explains why they have so many traditional therapeutic uses, such as an anti-microbial. They are a treasure trove of beneficial compounds including acetogenins, alkaloids, essential oils and terpenoids.¹ Custard apples contain polyphenols including flavonoids which have potent antioxidant effects.² This is important because the brain is highly susceptible to oxidative stress, which is implicated in depression, anxiety and emotional stress as well as degenerative brain diseases.³ Bullatacin is an acetogenin unique to fruit in the custard apple family (*Annonaceae*) and shows potential anti-cancer activity.⁴

Why enjoying fruit everyday can make you smile

Well firstly fruits such as custard apples are delicious and that is reason enough to smile. Look a little deeper however and there is science to back up the feel-good power of fruit. Intake of raw fruits and vegetables in particular was found to be associated with better mental health in one study.⁵

Fruit such as custard apples are great for the lunchbox and are good for children's emotional wellbeing. A study of children in Victoria found those who ate more fruit had more helpful social skills such as emotional control, problem management and relationship building.⁶

In young adults enjoying an extra two servings of fruit a day improved their feelings of vitality, flourishing and motivation.⁷ Flavonoids in general have also been shown to keep the brain sharp and enhance memory as we age.⁸

How eating plants helps your spirit dance

It seems an eating pattern with plenty of fruit and vegetables really does help you look on the bright side. A large study of nearly nine thousand adults in Finland found eating fresh vegetables and salads, salad dressing, berries and fruit was associated with a more optimistic outlook on life.⁹ A study of women aged 45-60 years in Poland found women who ate raw vegetables, fruit, nuts, plant oils and fruit and vegetable juices more frequently had higher levels of self-efficacy, and those who ate fruit, nuts and fruit juices more frequently had higher levels of optimism and satisfaction with life.¹⁰ A population study in France of nearly 33,000 people found optimism was associated with overall diet quality and higher consumption of fruit and vegetables and nuts.¹¹

Closer to home, Australian research in women has found following the Australian Dietary Guidelines that recommend fruit, vegetables, mushroom and nuts reduced their risk of developing depressive symptoms over 5 years.¹²

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NIP nutrient composition database references

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^Phenol explorer Database available at URL <http://phenol-explorer.eu/contents/food/185>

Santos WN, Sauthier MC, Cavalcante DD et al. Mineral composition, nutritional properties, total phenolics and flavonoids compounds of the atemoya fruit (*Annona squamosa* L. x *Annona cherimola* Mill.) and evaluation using multivariate analysis techniques. *An Acad Bras Cienc*. 2016;88(3):1243-1252. doi:10.1590/0001-3765201620150537 <https://pubmed.ncbi.nlm.nih.gov/27598843/>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SEARCH TERMS USED FOR PUBMED: Custard apple and/or *Annona atemoya* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

22. EGGPLANT / AUBERGINE A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Pack a punch with eggplant and vitamin B6 for optimal energy production.
- Eggplant can make you auber-genius thanks to vitamin B6 for brain health.
- Eggplants excel in vitamin E which offers antioxidant protection

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/Aussie eggplant.

Eggplant:

- ✓ Rich in vitamin B6 – brain health
- ✓ Source of vitamin E – antioxidant protection
- ✓ Contains anthocyanins - antioxidant
- ✓ Source of fibre – healthy gut bacteria
- ✓ High moisture content – helps hydration

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Eggplant fun facts:

- Did you know eggplants are actually classified as a berry fruit – the entire ovary of the fruit ripens into a fully edible soft fruit?
- The name “eggplant” is due to some eighteenth century European cultivars that were yellow or white and resembled goose or hen’s eggs.
- Eggplants come in many colours from dark purple-black to green, violet or even pink and white stripes (!)
- Raw eggplant has a somewhat bitter taste, but becomes tender when cooked and develops a rich, complex flavour. Eggplants can absorb large amounts of cooking oils, but salting reduces the amount of oil absorbed.
- Eggplant is a staple of the Mediterranean diet, a lifestyle and way of eating that has been shown to support longevity.¹
- In China, as part of her “bride price,” a woman must have at least 12 eggplant recipes prior to her wedding day. Luckily that should be easy as eggplants are so versatile they can be fried, battered, layered in gratin, grilled, stuffed, stewed, pureed or baked.

NUTRITION INFORMATION

Serving size: 75g

(1/2 cup or 1/4 eggplant baked)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	69g		92g
Energy	82kJ	1%	109kJ
Protein	1.0g	2%	1.3g
Total fat	0.3g	<1%	0.4g
Saturated fat	0g	0%	0g
Total Carbohydrates	2.3g	1%	3.1g
Sugars	2.3g	3%	3.1g
Dietary fibre	2.2g	7%	2.9g
Sodium	4.5mg	<1%	6mg
Vitamin B6	1.4mg	89%	1.9mg
Vitamin E	2.3mg	24%	3.1mg
Total polyphenols^^	100mg GAE		134mg GAE
Anthocyanins^^	6.5mg		8.7mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

References for website:

1. Davis C, Bryan J, Hodgson J, Murphy K. Definition of the Mediterranean Diet; a Literature Review. *Nutrients*. 2015;7(11):9139-9153. doi:10.3390/nu7115459 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4663587/>
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<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR EGGPLANT

Individual consumer friendly nutrient content and permitted general level health claims:

- Pack a punch with eggplant and vitamin B6 for optimal energy production. Half a cup contains almost 90% of your daily vitamin B6 requirements and activates energy metabolism. OR
- Eggplant can make you auber-genius thanks to vitamin B6 for brain health. Just half a cup of eggplant will help keep your brain healthy as it provides nearly 90% of your daily vitamin B6 requirements to support neurological function.
- Eggplants are rich in protective antioxidants like vitamin E to prevent free radical damage. Just one 75g serve provides 24% of the RDI for Vitamin E.
- The rich violet purple pigments of eggplant are due to antioxidant anthocyanins (6.5mg per serve).
- This favourite Mediterranean vegetable is a source of fibre and one 75g serve provides 2g or 7% of your daily needs to keep your gut bacteria healthy.
- Eggplants are 92% water and can help contribute to body fluids to help keep you hydrated.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables such as eggplant is good for brightening your mood, brain function, psychological wellbeing and happiness.

Subcategory COOKING claim:

- Eggplants can be cooked in so many ways. Cooking together has positive effects on wellbeing and quality of life.

Category FRUIT and/or VEGETABLE and/or NUT claim PLUS HYDRATION:

- A healthy, varied diet containing a variety of fruit, vegetables and mushrooms contributes fluids to help hydration, and maintain brain function and mood.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 75g

(1/2 cup or 1/4 eggplant baked)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	69g		92g
Energy	82kJ	1%	109kJ
Protein	1.0g	2%	1.3g
Total fat	0.3g	<1%	0.4g
Saturated fat	0g	0%	0g
Total Carbohydrates	2.3g	1%	3.1g
Sugars	2.3g	3%	3.1g
Dietary fibre	2.2g	7%	2.9g
Sodium	4.5mg	<1%	6mg
Vitamin B6	1.4mg	89%	1.9mg
Vitamin E	2.3mg	24%	3.1mg
Total polyphenols^^	100mg GAE		134mg GAE
Anthocyanins^^	6.5mg		8.7mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

This beautifully-elongated, purple-skinned vegetable is nutrient-rich that help support brain health, protect body cells, and assist in producing energy to keep you feeling good with a positive outlook on life.

Phytonutrients present in eggplant protect cell membranes and boost the memory function of the brain.¹ The violet purple pigment is due to anthocyanins particularly one called nasunin which is a potent scavenger of free radicals.² Anthocyanins are phytochemicals that may have a protective effect on the brain by improving cognitive performance and memory.³ Anthocyanins can also cross the blood-brain barrier and have a positive effect on areas of learning and memory.⁴ An interesting analysis of the Australian Health Survey found the average intake of anthocyanins by Australian adults was 24mg/day higher than international estimates.⁵

A few studies have analysed the vegetable food group separately and found people enjoying higher amounts of vegetables had an 18% lower risk of experiencing symptoms of depression.⁶ Other researchers found the days when more vegetables are eaten means enhanced psychological wellbeing.⁷ On days when individuals consumed 0.15 more portions of vegetables (and 0.11 more portions of fruit), they experienced higher positive affect, which included feeling calmer, happier, and more energetic.^{8,9} An Australian Mediterranean diet study found people in the study with greater vegetable diversity had greater reduction in depression and improved mental health scores - sustained over 6 months.¹⁰ Given eggplant is a key feature of the Mediterranean diet, it is the perfect vegetable for Aussies to include when following this type of diet and lifestyle.

Eggplants contain 92% moisture that can contribute to the body's total fluids. Hydration is important for brain function, emotional wellbeing and mood. The brain contains 75% water and water loss can affect brain function.¹¹ Even a small amount of body water loss (around 1%) is enough to affect cognition as dehydration affects energy production in brain cells and reduces the chemical messengers involved in learning and memory.¹² In adults, dehydration can increase negative emotions such as anger, confusion, tension, anxiety and depression while consuming fluids can improve cognitive function and mood.¹³

Some of the best-known vegetable dishes in the world feature eggplant, including Greece's moussaka, Italy's eggplant parmigiana, France's ratatouille and the Middle East's baba ghanoush. Get into cooking with eggplant. Cooking can promote positivity, as it requires mastering a number of skills that exercise the brain and require heightened cognition. Mastering these skills can lead to improved mood, self-confidence, as well as self-awareness. Cooking requires integration of cognitive, physical, and socio-emotional processes.¹⁴ A population-based survey of 8,500 adolescents in New Zealand, found self-reported cooking ability was positively associated with better family connections and greater mental wellbeing.¹⁵

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 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>
 ^^Fronsd AD, Iuhac CI, Stirbu I, et al. Phytochemical Characterization of Five Edible Purple-Reddish Vegetables: Anthocyanins, Flavonoids, and Phenolic Acid Derivatives. *Molecules*. 2019;24(8):1536. doi:10.3390/molecules24081536 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6514853/>

SEARCH TERMS USED FOR PUBMED: Eggplant and aubergine and *Solanum melongena* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

23. ENGLISH SPINACH A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Green for a shiny sheen. English spinach packed with vitamin C for good mood vibes.
- Eating spinach, just a cup, is sure to lift your mood up. Rich in vitamin C.
- Get firing on all cylinders thanks to plant iron in English spinach.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie English spinach.

English spinach:

- ✓ Rich in vitamin C – lifts mood
- ✓ Rich in folate – psychological function
- ✓ Source of iron – beats fatigue
- ✓ Source of magnesium – good brain function
- ✓ Source of manganese – energy production
- ✓ Source of vitamin E – antioxidant defence
- ✓ Contains potassium – steady nerves
- ✓ Contains polyphenols – antioxidant protection
- ✓ Contains beta-carotene – antioxidant protection
- ✓ Contains fluids – helps hydration

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

English spinach fun facts:

- English spinach is a native plant of Persia (modern day Iran).
- English spinach grows best in cool (not freezing) moist conditions, such as spring and autumn, and grows well in sandy soils.
- Spinach farmers of the 1930's credited the fame of Popeye the Sailor man for a 33% boost in spinach consumption which was much needed during The Great Depression.
- In the medieval days, artists used to extract green pigment from spinach to use as ink or paint.
- Don't dilly dally with your spinach. A week or so after being harvested spinach has lost half its folate and carotenoids.¹
- English spinach is a valuable source of plant-based iron for vegans and vegetarians, as iron is essential for transporting oxygen around the body.²

NUTRITION INFORMATION

Serving size: 75g (1 cup raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	70g		93g
Energy	62kJ	1%	82kJ
Protein	1.8g	4%	2.4g
Total fat	0.2g	<1%	0.3g
Saturated fat	0g	0%	0g
Total Carbohydrates	0.5g	<1%	0.6g
Sugars	0g	0%	0g
Sodium	15.8mg	1%	21mg
Potassium	428mg		570mg
Folate eq	83ug	41%	110ug
Vitamin C	20mg	51%	27mg
Vitamin E	1.0mg	10%	1.3mg
Iron	2.4mg	20%	3.2mg
Magnesium	51mg	16%	68mg
Manganese	0.6mg	12%	0.8mg
Total polyphenols^	154mg GAE		205mg GAE
Beta-carotene eq	1470ug		1970ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

- 1 <https://www.sciencedaily.com/releases/2005/03/050323124809.htm>
- 2 <https://www.nrv.gov.au/nutrients/iron>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR ENGLISH SPINACH

Individual consumer friendly nutrient content and permitted general level health claims:

- Looking to boost your mood naturally? Add a cup of vitamin C-rich English spinach to your daily diet - you'll get 51% of your vitamin C needs; a cupful of happiness.
- A 75g serve of green English spinach is a rich source of folate to minimise fatigue, just a cup of this foliage provides 41% of your daily needs.
- Get firing on all cylinders thanks to plant iron in English spinach it helps the body produce energy to fight fatigue. Fresh green English spinach leaves provides 2.4mg of plant iron in just a cup (20% RDI).
- Feed your brain English spinach leaves to keep it functioning at optimal levels. A cup contains 16% of the RDI (Recommended Dietary Intake) for magnesium, an essential nutrient for brain function.
- Looking for an energy boost? Add a cup of English spinach to your salad and get 12% of your daily requirements for manganese, a vital nutrient that supports energy production.
- A cup of English spinach provides 10% of the RDI for antioxidant vitamin E.
- A 75g serve of English spinach provides around 430mg of potassium for a normal functioning nervous system.
- English spinach may be green but beneath the green is the orange pigment beta-carotene - an antioxidant to protect your body cells from free radical damage. A cup provides 1470ug.
- English spinach also contains other polyphenol antioxidants (154mg in a 75g serve) which helps cells overcome free radical damage.
- There is a lot of moisture in English spinach leaves, in fact the leaves contain 93% fluids. It a good green leafy vegetable to help contribute to body hydration.

NUTRITION INFORMATION

Serving size: 75g (1 cup raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	70g		93g
Energy	62kJ	1%	82kJ
Protein	1.8g	4%	2.4g
Total fat	0.2g	<1%	0.3g
Saturated fat	0g	0%	0g
Total Carbohydrates	0.5g	<1%	0.6g
Sugars	0g	0%	0g
Sodium	15.8mg	1%	21mg
Potassium	428mg		570mg
Folate eq	83ug	41%	110ug
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Vitamin E	1.0mg	10%	1.3mg
Iron	2.4mg	20%	3.2mg
Magnesium	51mg	16%	68mg
Manganese	0.6mg	12%	0.8mg
Total polyphenols^	154mg GAE		205mg GAE
Beta-carotene eq	1470ug		1970ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as English spinach, as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables, such as English spinach, is good for brightening your mood, brain function, psychological wellbeing and happiness.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Since the days of Popeye, spinach has been famous for its ability to make you "strong to the finish." While this leafy green won't necessarily cause your biceps to inflate like balloons, it is packed with vitamins, minerals and phytonutrients – all of which contribute to keeping you happy and healthy.

Research has uncovered some 100 chemical compounds from spinach. The major active components are flavones, flavanols, glucuronides, and carotenoids. These compounds antioxidant, anti-inflammatory, cognitive and mood effects.¹

The pigments in green English spinach add colour to your plate, and they may colour your world as you age by reducing the brain's decline. Spinach leaves get their bright green colour from chlorophyll mixed with carotenoids including neoxanthin, beta-carotene, lutein and zeaxanthin.² Carotenoids appear to have cognitive benefits. In the large US NHANES study, the highest consumers of lutein and zeaxanthin performed better in cognitive tests than the lowest consumers.³

Carotenoids also help counter oxidative stress throughout the body. The brain is considered highly susceptible to oxidative stress, or the imbalance between the production of pro-oxidative reactive molecules and counteracting antioxidants. This 'redox imbalance' is implicated in psychological disorders such as depression, anxiety and emotional stress as well as degenerative brain diseases.⁴ English spinach contains polyphenols, potent antioxidants that also show anti-inflammatory effects.

A review of 61 studies analysing the association between fruit and vegetable intake and mental health in adults found a high total intake of fruit and vegetables (and specific subgroups including green leafy vegetables) may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms.⁵

A review of 17 studies found an association between higher fruit and vegetable intake and better mental health in adolescents. The strongest benefits were found for green vegetables, yellow vegetables and fruit. The components of mental health assessed included health-related quality of life, mental health status, happiness and self-esteem as well as anxiety, stress and distress, and depressive symptoms.⁶

Further research has found consumption of green vegetables by adolescents is associated with a reduced risk of depression^{7,8} and better behaviour in young people.⁹

Green leafy vegetables were listed in the top 10 raw foods linked to better mental health.¹⁰ And a worksite nutrition program coined the acronym G-BOMBS +T as way to remind study participants of what to eat: **G**reens, **B**eans, **O**nions, **M**ushrooms, **B**erries, **S**eeds and nuts plus **T**omatoes. Together these foods significantly improved sleep quality, quality of life, and depressive symptoms.¹¹

One of the unique nutrients in spinach is iron. Iron is a component of haemoglobin, which is important for the transport of oxygen in blood throughout the body.¹² Iron-deficiency is quite prevalent in vegetarian diets¹³, and including green leafy vegetables like spinach for vegetarians can be a valuable source of dietary iron. Iron deficiency is associated with decreased wellbeing and increased fatigue, which impairs cognitive function.¹⁴ Plant irons are not as well absorbed as iron from meat sources however. So to boost absorption eat plant foods rich in iron with a vitamin C source. Vitamin C helps absorb plant iron. Vitamin C is found in tomato, capsicum, and citrus all perfect salad partners for English spinach. We're strong to the finish – get stuck into English spinach!

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 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: English spinach and *Spinacia oleracea* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

24. GRAPEFRUIT A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Need a laugh; have half! Grapefruit is loaded with vitamin C to boost psychological wellbeing and help keep you smiling.
- Squeeze the best out of life! Grapefruit contains natural sugars and folate to keep you energised and uplifted.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/Aussie grapefruit.

Grapefruit:

- ✓ Rich in vitamin C – psychological wellbeing
- ✓ Source of folate – combats tiredness
- ✓ Source of biotin – emotional regulation
- ✓ Source of fibre – happy gut
- ✓ Contains polyphenols–antioxidant protection
- ✓ Contains moisture – hydration
- ✓ Contains natural fruit sugars - for energy
- ✓ Contains low glycemic index carbs – sustained energy

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Grapefruit fun facts:

- Grapefruit is an accidental hybrid cross between an orange and a pomello that originated in Barbados. You could say grapefruit are a happy accident!
- Grapefruit were named because they hang from the tree in grape-like clusters.
- Grapefruit has a low glycemic index (GI=25) for sustained energy.
- Grapefruit is full of juice (89% moisture) which provides hydration - important for brain function and mood¹

NUTRITION INFORMATION

Serving size: 150g (1/2 a grapefruit raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	134g		89g
Energy	188kJ	2%	125kJ
Protein	1.4g	3%	0.9g
Total fat	0.3g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	7.2g	2%	4.8g
Sugars	7.2g	8%	4.8g
Dietary fibre	2.6g	9%	1.7g
Sodium	6mg	<1%	4mg
Folate eq	21ug	11%	14ug
Biotin	2.9mg	10%	1.9mg
Vitamin C	54mg	135%	36mg
Total polyphenols [^]	107mg GAE		71mg GAE
Beta-carotene eq	18ug		12ug
Glycemic Index (GI) ^{^^}	25 (low)		

Source: Aust Food Comp Data or [^] USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

- 1 Liska D, Mah E, Brisbois T, et al. Narrative Review of Hydration and Selected Health Outcomes in the General Population. *Nutrients*. 2019;11(1):70. doi:10.3390/nu11010070
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NIP nutrient composition database references

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[^]USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^{^^}Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SUBSTANTIATION FOR GRAPEFRUIT

Individual consumer friendly nutrient content and permitted general level health claims:

- Half a juicy grapefruit (150g) provides all your vitamin C needs for the day (135% RDI). Vitamin C is needed for psychological wellbeing and normal nervous system function.
- Half a grapefruit contains 11% of the recommended daily amount for folate, required for energy production and reduction of tiredness and fatigue.
- Half a grapefruit contains 10% RDI for biotin, needed for psychological function and emotional regulation.
- Get 3g of gut-loving fibre in half a grapefruit.
- A serve of grapefruit (150g) contains 107mg polyphenols for antioxidant protection.
- A juicy grapefruit half contains around 130ml of fluids contributing to your daily intake.
- Grapefruit contains natural fruit sugars for energy.
- Grapefruit contains low glycemic index carbs (GI=25) for sustained energy.

*When eaten as part of a healthy varied diet
(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as grapefruit, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as grapefruit is good for mental wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 150g (1/2 a grapefruit raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	134g		89g
Energy	188kJ	2%	125kJ
Protein	1.4g	3%	0.9g
Total fat	0.3g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	7.2g	2%	4.8g
Sugars	7.2g	8%	4.8g
Dietary fibre	2.6g	9%	1.7g
Sodium	6mg	<1%	4mg
Folate eq	21ug	11%	14ug
Biotin	2.9mg	10%	1.9mg
Vitamin C	54mg	135%	36mg
Total polyphenols [^]	107mg GAE		71mg GAE
Beta-carotene eq	18ug		12ug
Glycemic Index (GI) ^{^^}	25 (low)		

Source: Aust Food Comp Data or [^] USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Grapefruit is an accidental hybrid cross between an orange and a pomello that originated in Barbados. The origins of the grapefruit are a happy accident, and you can be happy about their mood boosting benefits.

Interesting compounds in grapefruit

Plant foods are just one big bag of chemistry – natural compounds with important health benefits. Citrus like grapefruit are known for containing polyphenol antioxidants. The main type of flavanones in grapefruit are hesperidin and naringenin (naringenin give grapefruit its bitter/sour taste) and also narirutin and didymin. Who comes up with these chemical names?! Grapefruit also contain

furanocoumarins that are known to cause undesirable interactions with several medications, however furanocoumarins also have antioxidant and anti-inflammatory effects.¹

Inflammation plays a role in the development of several diseases including degenerative disorders affecting the brain such as dementia.² Hesperidin and naringenin from grapefruit have anti-inflammatory and antioxidant activities thought to protect against neurodegenerative disorders.³ As the white spongy portion and membranes separating the grapefruit segments have very high flavanone content, the whole grapefruit contains up to five times as much antioxidants as juice⁴ which reinforces the advice to eat the whole fruit and not just the juice.

Red (or Ruby) grapefruit contains lycopene that may improve vascular function and prevent cardiovascular disease in the brain. Lycopene has many protective effects including combating atherosclerosis (hardening of the blood vessels), high blood pressure and the development of blood clots. Lycopene also has antioxidant and anti-inflammatory activity.⁵

Current evidence supports a link between cardiovascular disease and brain conditions such as stroke, dementia and cognitive impairment. Several large, general population studies have demonstrated that cardiovascular risk factors, aside for contributing substantially to the risk of stroke, negatively influence overall brain health.⁶

A review of diets, food and food components found antioxidant polyphenols in citrus may improve inflammation, endothelial (blood vessel) function and oxidative stress after a meal. Together this may reduce the adverse effects of meals high in saturated fats and sugars.⁷ Enjoying some grapefruit after a rich meal not only cleanses the palate but might also help reduce the impact of your indulgence!

Citrus fruit in general are rich in three specific flavonoid sub-groups, the flavanols, flavanones and anthocyanins in some darker coloured fruit such as ruby grapefruit. These compounds have great potential to protect the brain and nervous system and reverse age-related declines in memory and learning.^{8,9}

Hydration and mood

Grapefruits are juicy, containing 89% moisture or about 130ml in half a grapefruit. This can contribute to your daily fluid needs. Adequate hydration is important for brain function, emotional wellbeing and mood. In adults, even just a small loss of body fluids (around 1%) can increase negative emotions such as anger, confusion, tension, anxiety and depression; while consuming fluids can improve cognitive function and mood.¹⁰

Glycemic Index (GI) of Grapefruit

Grapefruits contain natural sugars for energy with a low GI of 25. This means their energy is longer lasting. A lower GI diet is of benefit for overall health, including mental wellbeing. Large population studies have found higher GI diets are associated with symptoms of depression, and the large ups and downs in blood glucose and insulin levels from high glycemic impact foods can cause anxiety and irritability.¹¹

Fruit and vegetables, mental health, psychological wellbeing and mood

A systematic review of 61 studies analysing the association between fruit and vegetable intake and mental health in adults found a high total intake of fruit and vegetables and the specific subgroup citrus fruit may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms. The authors concluded that total fruit, and citrus fruit intake specifically, have a positive influence on mental health.¹²

A study in young adults examining associations between intake of raw fruit and vegetables and mental health found raw fruit and vegetable intake predicted reduced depressive symptoms and higher positive mood, life satisfaction, and flourishing. The top 10 raw foods related to better mental health included citrus fruit generally, and grapefruit specifically.¹³

In both adults and children, emerging evidence suggests that increased fruit intake could improve psychological wellbeing.¹⁴ Particular fruit including citrus may play a role in maintaining brain health and reducing cognitive decline.¹⁵

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SEARCH TERMS USED FOR PUBMED: Grapefruit or *citrus paradisi* and review diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/antioxidants]

25. GREEN BEANS A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Get full of beans! Green beans contain biotin a mood booster so your mind and body are ready for anything.
- Beans mean smarts! B for beans B for biotin – biotin supports psychological function and emotional wellbeing.
- Clever carotenoids in green beans de-stress your brain to keep you thinking right and feeling good.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie green beans.

Green Bean:

- ✓ Source of biotin – psychological wellbeing
- ✓ Source of fibre – happy gut
- ✓ Contains carotenoids – antioxidant protection
- ✓ Contains polyphenols – fight free radicals

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Green Bean fun facts:

- Green beans were first domesticated in Peru and there are over 130 known varieties, some of which are purple, red, yellow or streaked.¹
- Green beans are also known as string beans, French beans or snap beans (because that's the sound they make when you break a fresh one in half).
- The expression 'full of beans' means to be optimistic, enthusiastic, cheerful, lively and full of energy and originates from 14th century Europe to describe the lively and energetic effect on horses fed fodder beans.²
- Did you know at wedding ceremonies in Nicaragua, the bride and groom are given a bowl of beans for good luck?³
- Green beans are super versatile: they're great steamed, microwaved, stir-fried or roasted; raw with dips, or in soups, stews and curries.
- For a quick and easy burst of colour, flavour and nutrition with dinner - serve microwaved or steamed beans dressed with extra virgin olive oil and a sprinkle of toasted almonds (add some crushed garlic to the oil for even more flavour).
- Green beans are an excellent source of vitamin K (45% RDI) important for bone health and normal blood clotting.

NUTRITION INFORMATION

Serving size: 75g (1/2 cup boiled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	68g		91g
Energy	86kJ	1%	115kJ
Protein	1.4g	3%	1.9g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	2.6g	1%	3.5g
Sugars	2.1g	2%	2.8g
Dietary fibre	2.3g	8%	3g
Sodium	0mg	0%	0mg
Biotin	3.5ug	12%	4.6ug
Vitamin K [^]	36ug	45%	48%
Total polyphenols ^{^^}	24mg		32mg
Beta-carotene	199ug		265ug
Lutein and zeaxanthin [^]	481ug		641ug

Source: Aust Food Comp Data or [^] USDA

^{^^} Phenol explorer database

*based on an average adult diet of 8700 kJ

"<" = less than

References for website:

1. https://en.wikipedia.org/wiki/Green_bean
2. <https://www.theidioms.com/full-of-beans/>
3. https://ausveg.com.au/app/uploads/2018/05/Vegetables-Australia_May-June-2018_Vege-Stats.pdf

NIP nutrient composition database references

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^ Phenol explorer. Database on polyphenol content in foods. Available at http://phenol-explorer.eu/contents/food/334?utf8=%E2%9C%93&options%5Blist_format%5D=list&options%5Bempty_rows%5D=on&options%5Bunit_type%5D=weight#folin-assay

SUBSTANTIATION FOR GREEN BEAN

Individual consumer friendly nutrient content and permitted general level health claims:

- Half a cup of cooked green beans contains 12% of the daily recommended amount of biotin, a B-vitamin important for psychological wellbeing and optimal metabolism.
- The 2g of fibre in ½ cup of green beans helps keep the millions of microbes in your gut happy, which helps keep you happy in body and mind.
- Green beans contain colourful carotenoids (beta-carotene and lutein zeaxanthin) that give them their bright colour. These clever compounds help protect the brain from oxidative stress to keep you thinking right and feeling good.
- The antioxidant polyphenols in green beans fight free radicals and reduce inflammation throughout the body including the brain and nervous system so you can think clearly and feel on top of things.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as green beans, as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables, such as green beans, is good for brightening your mood, brain function, psychological wellbeing and happiness.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Here's some scientific information behind the recommendation to get 'full of beans' for better mind and mood, and the smarts behind green beans.

Interesting compounds in green beans

The pigments in green beans add colour to your plate, and they may colour your world as you age by reducing the brain's decline. Beans get their bright green colour from chlorophyll mixed with carotenoids including beta-carotene, lutein and zeaxanthin. Carotenoids help counter oxidative stress

NUTRITION INFORMATION

Serving size: 75g (1/2 cup boiled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	68g		91g
Energy	86kJ	1%	115kJ
Protein	1.4g	3%	1.9g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	2.6g	1%	3.5g
Sugars	2.1g	2%	2.8g
Dietary fibre	2.3g	8%	3g
Sodium	0mg	0%	0mg
Biotin	3.5ug	12%	4.6ug
Vitamin K^	36ug	45%	48%
Total polyphenols^^	24mg		32mg
Beta-carotene	199ug		265ug
Lutein and zeaxanthin^	481ug		641ug

Source: Aust Food Comp Data or ^ USDA

^^ Phenol explorer database

*based on an average adult diet of 8700 kJ

"<" = less than

throughout the body, including the brain, and have been shown to protect against age-related diseases so you think clearly for longer. Having higher intakes of beta-carotene is associated with better cognitive function in older people and is stronger for food sources than supplements.¹ It really is better to get your nutrition from real food rather than pills (and it tastes whole lot better too).

Green beans are also a source of polyphenols mostly in the subgroup lignans and flavonoids. Six different sub types of flavonols have been identified and known as phyto-protectants because of their availability and beneficial activity in the body when eaten. Flavonoids have high antioxidant activity, act as vasodilators (they relax blood vessel walls to enable better circulation) and reduce DNA mistakes in cells.²

Controlling systemic inflammation (general inflammation that occurs throughout the body) may also help prevent age-related diseases.¹ Some more unusual varieties of beans with purple and red colours have polyphenol flavonoids called anthocyanins as well, and these have anti-inflammatory effects that appear to protect the brain and improve cognitive performance and memory.³

Dietary fibre, gut health and mood

Gut health is a hot area of research as we discover the amazing links between the state of our gut, its microbial inhabitants and the rest of the body – everything it seems, is connected. Green beans contain fibre that we know is good for digestive health. Diets low in fibre disturb the balance of gut bacteria and this can reduce in psychological wellbeing, cause us to respond badly to stress and alter behaviour and mood. Diets high in fibre can improve the gut bacteria to improve psychological wellbeing. A healthy bacterial population produces short chain fatty acids such as butyrate and propionate that directly affect our brain and behaviour by reducing brain inflammation and managing overall brain maintenance such as scavenging damaged or unnecessary cells.⁴

Fruit and vegetables, mental health, psychological wellbeing and mood

Several studies have found that realistic increases in fruit and vegetables can have a positive impact on mood. Eating just one more portion of vegetables and fruit each day is enough to improve psychological wellbeing with the results are cumulative - the more you eat, the better you feel.^{5,6}

Green vegetables have been found to be important for adolescent mental health. Consumption of green vegetables is associated with a reduced risk of depression^{7,8} and better behaviour in young people⁹.

Eating green vegetables is also associated with a reduced risk of depression during pregnancy.¹⁰ Pregnancy is a critical time for both mother and growing baby and adding a serve of green beans to a meal might just make a positive difference to how a woman feels during this significant time.

Does eating greens work in real life to boost mood? A staff canteen promotion says yes. A worksite health promotion initiative that encouraged employees to eat a healthy vegetable-based diet resulted in significant improvements in their sleep quality, quality of life, and depressive symptoms. The initiative used the acronym 'G-BOMBS +T' to remind employees what to eat each day. The letters stood for **G**reens - **B**eans, **O**nions, **M**ushrooms, **B**erries, **S**eeds and nuts + **T**omatoes.¹¹

Gotta love a good acronym!

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^ Phenol explorer. Database on polyphenol content in foods. Available at http://phenol-explorer.eu/contents/food/334?utf8=%E2%9C%93&options%5Blist_format%5D=list&options%5Bempty_rows%5D=on&options%5Bunit_type%5D=weight#folin-assay

SEARCH TERMS USED FOR PUBMED: Green beans or *Phaseolus vulgaris* and review and diet and [mood/ psychological / optimism/ brain / cognition/antioxidants]



26. GREEN PEAS A GOOD MOOD FOOD

WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

Make life easy peasy!

Just roll with it:

- Banish brain fatigue with B-vitamins in green peas.
- Feast your mind and foster your emotional wellbeing with vitamin C-rich green peas.
- Folate in green peas supports your brain to think well and feel well.
- Clever carotenoids in green peas de-stress your brain to keep you feeling good.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/Aussie green peas.

Green pea:

- ✓ Rich in vitamin C – brain health
- ✓ Good source of fibre – gut health
- ✓ Source of folate – psychological wellbeing
- ✓ Source of niacin – fight fatigue
- ✓ Source of thiamin – energy production
- ✓ Contains carotenoids – antioxidant protection
- ✓ Contains polyphenols – fight free radicals

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Green pea fun facts:

- The ancient Romans grew over 37 varieties of peas.¹
- The world record for eating the most peas with chopsticks in one minute is 7175, achieved by an English woman from Sussex!¹
- The expression 'like peas in a pod' describes people or things that are very similar because green peas within a pod are very uniform in colour, size and shape.
- Did you know peas are actually a pulse, and in the same family as legumes such as lentils.
- Most peas in Australia are purchased frozen for convenience, although eating them fresh from the pod is a delight. Frozen peas are picked at their prime and frozen quickly to retain their nutritional value.
- Green peas are rich in vitamin K to maintain strong bones and help blood to clot.²

NUTRITION INFORMATION

Serving size: 75g (half a cup, boiled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	62g		83g
Energy	188kJ	2%	251kJ
Protein	3.6g	7%	4.8g
Total fat	0.3g	<1%	0.4g
Saturated fat	0g	0%	0g
Total Carbohydrates	4.8g	2%	6.4g
Sugars	2g	2%	2.7g
Dietary fibre	3.9g	13%	5.2g
Sodium	<1mg	<1%	1mg
Thiamin	0.2mg	16%	0.23mg
Niacin eq	1.7mg	17%	2.2mg
Folate eq	47.3ug	24%	63ug
Vitamin C	10.5mg	26%	14mg
Vitamin K^	20ug	25%	26ug
Total polyphenols^	450mg GAE		600mg GAE
Beta-carotene eq	311ug		415ug
Lutein and zeaxanthin^	1950ug		2590ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

1. <https://www.thefactsite.com/interesting-pea-facts/#:~:text=Peas%20can%20be%20eaten%20straight,person%2C%20per%20year%20in%20Britain.>
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NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR GREEN PEA

Individual consumer friendly nutrient content and permitted general level health claims:

- Half a cup of cooked green peas (75g) provides one quarter of the daily recommended amount of vitamin C. Vitamin C is needed for emotional wellbeing through its role in maintaining psychological function and the nervous system.
- Green peas are a good source of fibre to nurture the microbiome for a happy gut with 4g in a 1/2 cup serve.
- The folate in green peas helps support psychological function, and there is almost a quarter of your daily recommended amount in half a cup of cooked peas.
- Green peas are a source of niacin, providing 17% of the recommended daily amount in half a cup of cooked peas. Niacin is important for reducing tiredness and fatigue to help you keep up on busy days.
- Green peas are a source of thiamin, a B-vitamin that helps the body produce energy for living, thinking and feeling. Half a cup of cooked peas provides 16% of the daily recommended amount.
- Green peas contain antioxidant carotenoids (beta-carotene and lutein and zeaxanthin) that give them their bright colour. These clever compounds help protect the brain from oxidative stress.
- The antioxidant polyphenols in green peas also fight free radicals, reduce oxidative stress and inflammation.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

NUTRITION INFORMATION

Serving size: 75g (half a cup, boiled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	62g		83g
Energy	188kJ	2%	251kJ
Protein	3.6g	7%	4.8g
Total fat	0.3g	<1%	0.4g
Saturated fat	0g	0%	0g
Total Carbohydrates	4.8g	2%	6.4g
Sugars	2g	2%	2.7g
Dietary fibre	3.9g	13%	5.2g
Sodium	<1mg	<1%	1mg
Thiamin	0.2mg	16%	0.23mg
Niacin eq	1.7mg	17%	2.2mg
Folate eq	47.3ug	24%	63ug
Vitamin C	10.5mg	26%	14mg
Vitamin K^	20ug	25%	26ug
Total polyphenols^	450mg GAE		600mg GAE
Beta-carotene eq	311ug		415ug
Lutein and zeaxanthin^	1950ug		2590ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as green peas, as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables, such as green peas, is good for brightening your mood, brain function, psychological wellbeing and happiness.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

'Eat your greens' is age-old advice for good health and green peas well and truly deserve their place at the table of green vegetables. There's a lot of good stuff crammed inside these little green balls to help your body and mind manage the ups and downs of life so you can just 'roll with it'.

What's so good about the 'green' in green peas?

The chlorophyll and carotenoids in green peas give them their bright green colour and mostly consist of lutein and zeaxanthin, known as xanthophyll carotenoids. These carotenoids may have potential to reduce the risk of Alzheimer's Disease, the most common type of dementia, and even improve brain performance in healthy people.¹ Carotenoids protect against age-related diseases by reducing oxidative stress and controlling systemic inflammation (general inflammation that occurs throughout the body).² Green peas are rich in vitamin C and contain another carotenoid beta-carotene which are important in the antioxidant defence of cells. Having higher intakes of these nutrients is associated with better cognitive function in older people and the association is stronger for food sources than supplements.³

Stress less with green peas

Oxidative stress and systemic inflammation are a root cause of psychological stress that many people struggle with. A study giving xanthophyll carotenoids to healthy young people over one year found they experienced reduced anxiety and psychological stress and had lower levels of cortisol hormone - a marker of stress. The researchers concluded these carotenoids significantly improved emotional health.⁴ While this study used supplements rather than real food, it provides great proof of the concept that carotenoids help with psychological wellbeing. Green peas are a very enjoyable way to get these clever carotenoids.

Green peas for a happy gut

Green peas are a good source of fibre, and this makes sense when you think that every single one is covered in a fibrous shell. Foods in the legume family such as green peas can enhance the gut microbiota because of their combination of fibre and phytonutrients. An optimal microbiota can positively impact psychological wellbeing in a number of ways. Gut bacteria can produce short chain fatty acids such as butyrate and propionate that directly affect brain physiology and behaviour by reducing brain inflammation.⁵

Why you should embrace the whole vegetable family to feel good

Eating vegetables and fruit is important at any age. A large Australian study of over 60,000 adults over 45 years of age that found regularly eating vegetables and fruit may help reduce psychological distress in middle and older age.⁶ Another study found giving young adults who didn't eat fruit and vegetables an extra two servings of fruit and vegetables a day significantly improved their feelings of vitality, flourishing, and motivation.⁷ An Australian study surveying 12,385 Aussie adults over several years also found that consistent fruit and vegetable consumption was predictive of increased happiness, life satisfaction and wellbeing.⁸

Fresh or frozen what will you do with green peas tonight? Fried rice, a warm veggie salad or may be good ol' pea and ham soup.

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SEARCH TERMS USED FOR PUBMED: Green peas or *pisum sativum* and review and diet and [mood/psychological/ brain/cognition/polyphenols/carotenoids/lutein]



27. HAZELNUT A GOOD MOOD FOOD

WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Hazel Nut – she’s your brain’s best friend/BFF – brimming with B vitamins for a bright mood and bright brain.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie hazelnut.

Hazelnuts:

- ✓ Rich in biotin – mood booster
- ✓ Rich in vitamin E – antioxidant protection
- ✓ Source of niacin – brain function
- ✓ Source of vitamin B6 - psychological wellbeing
- ✓ Source of folate – psychological function
- ✓ Source of thiamin – brain health
- ✓ Source of copper – brain and nerve function
- ✓ Source of magnesium – mental health support
- ✓ Source of manganese – energy production
- ✓ Contains potassium – nerve function
- ✓ Source of fibre – gut function
- ✓ Contains polyphenols – antioxidant protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Hazelnuts fun facts:

- Dry roasted, lightly salted hazelnuts are still heart healthy and people find them just as acceptable as raw nuts.¹
- Although raw hazelnuts have more brain-boosting B group vitamins – B vitamins are not heat stable.²
- Hazelnut-enriched diets (30-70g a day) reduce blood cholesterol without causing weight gain.³
- Hazelnuts have a sweet buttery flavour with hints of cocoa which is why they pair so well with chocolate.
- Hazelnut flavours do increase when heated tenfold.⁴
- Hazelnuts go well with other autumnal flavours e.g. apples, pears, figs, as well as coffee, vanilla and rosemary.

NUTRITION INFORMATION

Serving size: 30g (20 hazelnuts raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	2g		5g
Energy	807kJ	9%	2690kJ
Protein	4.4g	9%	14.8g
Total fat	18.4g	26%	61.4g
Saturated fat	0.8g	3%	2.7g
Monounsaturated fat	14.6g		48.8g
Polyunsaturated fat	2.2g		7.2g
Total Carbohydrates	1.5g	<1%	5.1g
Sugars	1.3g	2%	4.4g
Dietary fibre	3.1g	10%	10.4g
Sodium	<1mg	<1%	3mg
Potassium	204mg		680mg
Thiamin	0.1mg	11%	0.4mg
Niacin eq	1.7mg	17%	5.6mg
Vitamin B6	0.2mg	11%	0.6mg
Folate eq	33.9ug	17%	113ug
Biotin	23.7ug	79%	79ug
Vitamin E	4.8mg	48%	16mg
Copper	0.5mg	15%	1.5mg
Magnesium	48mg	15%	160mg
Manganese	1.1mg	21%	3.5mg
Total polyphenols^	251mg GAE		835mg GAE

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

References for website:

- Tey SL, Robinson T, Gray AR, et al. Do dry roasting, lightly salting nuts affect their cardioprotective properties and acceptability?. *Eur J Nutr.* 2017;56(3):1025-1036. doi:10.1007/s00394-015-1150-4. <https://pubmed.ncbi.nlm.nih.gov/26746221/>
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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR HAZELNUT

Individual consumer friendly nutrient content and permitted general level health claims:

Hazel Nut – she’s your brain’s best friend – brimming with B vitamins for a bright mood and bright brain:

- Hazelnuts are rich in biotin with 79% of the RDI for biotin in 30g. Biotin is a B vitamin needed for psychological function.
- Nibble on some niacin-containing hazelnuts with 17% of the RDI in a 30g handful. Niacin is another B vitamin needed for normal neurological and psychological function.
- Eat 20 hazelnut kernels and you’ll get 11% of the RDI for vitamin B6 essential for psychological wellbeing and energy production.
- Feast on a handful of hazelnuts – it provides 17% of the RDI for folate which is vital for psychological function and fighting fatigue.
- Hazelnuts are a source of thiamin with a 30g handful providing 11% of thiamin’s RDI – needed for neurological and psychological function.
- Crack open 20 hazelnuts they contain copper for a normal neurological function (15% of the RDI in 30g).
- Magnesium is needed to support mental health and a normal psychological function. Hazelnuts contain 15% of magnesium’s RDI in a 30g serve.
- Munch on a handful of hazelnuts for manganese. A 30g serve contains 21% of the RDI to boost energy production.
- A handful of hazelnuts contains 200mg of potassium - an electrolyte and nerve communicator.
- Enjoy eating 20 hazelnuts and boost your antioxidant vitamin E levels with 48% of the RDI in a serve.
- Hazelnuts contain 250mg of antioxidant polyphenols for brain cell protection.
- Hazelnuts’ russet red skins are a valuable source of fibre 3g in a 30g serve. Fibre improves gut health.

NUTRITION INFORMATION

Serving size: 30g (20 hazelnuts raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	2g		5g
Energy	807kJ	9%	2690kJ
Protein	4.4g	9%	14.8g
Total fat	18.4g	26%	61.4g
Saturated fat	0.8g	3%	2.7g
Monounsaturated fat	14.6g		48.8g
Polyunsaturated fat	2.2g		7.2g
Total Carbohydrates	1.5g	<1%	5.1g
Sugars	1.3g	2%	4.4g
Dietary fibre	3.1g	10%	10.4g
Sodium	<1mg	<1%	3mg
Potassium	204mg		680mg
Thiamin	0.1mg	11%	0.4mg
Niacin eq	1.7mg	17%	5.6mg
Vitamin B6	0.2mg	11%	0.6mg
Folate eq	33.9ug	17%	113ug
Biotin	23.7ug	79%	79ug
Vitamin E	4.8mg	48%	16mg
Copper	0.5mg	15%	1.5mg
Magnesium	48mg	15%	160mg
Manganese	1.1mg	21%	3.5mg
Total polyphenols^	251mg GAE		835mg GAE

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

“<” means less than

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory NUT claim:

- Nuts: Happiness in a handful. A healthy, varied diet containing a variety of nuts such as hazelnuts is good for brain function and psychological wellbeing – putting you in happy mood.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

What's not to love about hazelnuts - their sweet buttery taste, their russet red stripey skins and they're a nutrition powerhouse – yet hazelnuts are often overlooked.

But not anymore - hazelnuts have long been used to help with brain function. Traditional Persian (Iranian) medicine recommended hazelnuts as a treatment for memory impairment for those suffering from dementia, with symptoms of Alzheimer's Disease.¹

With so many brain-boosting nutrients: the B group vitamins – B6, biotin, thiamin, niacin and folate; minerals - copper, manganese, magnesium and potassium; and antioxidants: vitamin E and polyphenols, which all support psychological and neurological functions - hazelnuts a genuine good mood brain food.

An animal study found hazelnuts improved memory and reduced animal anxiety-related behaviour while also reducing inflammation of the nervous system.¹ Human studies have also shown how eating hazelnuts improves antioxidant capacity. Eating 40g of hazelnuts each day for six weeks saw improvement in the antioxidant capacity of 24 volunteers through activating genes involved in oxidant reactions and inflammation.²

Another 8-week, randomized, controlled study in children and adolescents diagnosed with hyperlipidemia (n=60) were asked to follow a dietary guidelines diet and were then randomised into three groups:

- group 1 received 15-30g hazelnuts with skin per day (amount based on body weight)
- group 2 received 15-30g hazelnuts without skin per day or
- group 3 (controls) received only dietary recommendations (no nuts).

At baseline and after 8 weeks, cholesterol was tested but so too oxidative levels of DNA damage. Both groups of hazelnut eaters had a significant reduction in DNA damage by 18.9%±51.3% (P=.002) and 23.1%±47.9% (P=.007) - skins and no skins respectively. This study showed eating hazelnuts even for a short time improved cell DNA protection and resistance against oxidative stress.³

A third study found no change in inflammatory markers with hazelnut consumption.⁴

Hazelnuts were also one of the nuts used in the famous PREDIMED diet study. The PREDIMED Mediterranean diet with just under 7,500 participants assessed for nearly 5 years found those following a Mediterranean diet with a daily 30g of nuts (hazelnuts, walnuts, almonds) had a 22% reduce risk of depression compared to those following a reduced fat diet. When only those with type 2 diabetes were assessed (nearly half the group) they had a 30% reduced risk of depression.⁵

These brain benefits may be explained by brain-derived neurotrophic factor (BDNF) which is a brain mood regulator. A daily 30g serve of the mixed nuts from above when consumed as part of a PREDIMED diet for over 3 years led to improved levels of BDNF.⁶

Mediterranean diets have also been found to improve cognition on older adults. A subgroup of 522 elderly people in the PREDIMED study eating a Mediterranean diet with a handful of mixed nuts every day had improved cognitive performance after 6.5 years compared to those following a reduced fat diet.⁷

Research has shown in general that regular nut consumption is linked with reduced depression and anxiety, and better cognitive function (memory and learning).⁸⁻¹²

A Chinese study of some 13,600 people found those eating nuts at least once a week had an 18% reduction in depression risk compared to those eating nuts less than once a week.⁸

The Australian SMILES trial with 67 participants found improvements in ratings of depression after 12 weeks of a special diet which included a daily serving of nuts.⁹ The same research team also identified folate and magnesium as key nutrients linked to lower depressive scores – nutrients found naturally in hazelnuts.¹⁰

Nuts have also been found to reduce anxiety in men – high nuts eaters were 66% less anxious than low nut eaters.¹¹

A review by University of South Australia researchers of more than 70 studies found a 30g handful of nuts enjoyed daily may improve mental processes such as memory, problem solving and decision making. It may be nuts' ability to reduce inflammation and improve blood flow that's key.¹²

So don't overlook hazelnuts they may just be your brain best friend. Try mixing them with other brain-boosting foods: apples, pears, avocado, banana, carrot and cherryoh and of course chocolate.

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NIP nutrient composition database references

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Hazelnut and/or *Corylus* and review and diet and [mood/psychological wellbeing/ optimism/ brain / cognition/]

28. HONEYDEW A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- You won't feel blue eating honeydew. Rich in vitamin C for happiness.
- A honeydew helping hand with folate for brain health

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie honeydew.

Honeydew:

- ✓ Rich in vitamin C – psychological wellbeing
- ✓ Source of folate – psychological function
- ✓ Contains potassium – nerve function
- ✓ Contains natural fruit sugars – natural energy
- ✓ Contains beta-carotene – antioxidant protection
- ✓ Contains polyphenols – antioxidant defence
- ✓ Contains moisture – helps hydration

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Honeydew fun facts:

- 'Honeydew melons' are also known as 'honey melons' or 'winter melons'.
- Honeydew melons were favoured by Napoleon and Cleopatra and originally reserved for the noble or wealthy.
- When selecting a honeydew, look for one with a waxy, not fuzzy, rind. The melon should feel heavy for its size, and the surface should bounce back when pressed.
- Melons are typically used raw, diced up in salads or cut in wedges. They are also popular ingredients for chilled soups, sweet dishes and beverages.
- When you think of hydration, the first thing that probably comes to mind is water. However, to effectively and properly hydrate, your body needs electrolytes too.¹ Honeydew melon is about 90% moisture and contains electrolytes, such as potassium and sodium. This combination of water and nutrients makes honeydew great for hydrating after a workout or if you're just trying to stay hydrated throughout your day.

NUTRITION INFORMATION

Serving size: 150g (3/4 cup raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	135g		90g
Energy	224kJ	3%	149kJ
Protein	1.1g	2%	0.7g
Total fat	0.5g	<1%	0.3g
Saturated fat	0g	0%	0g
Total Carbohydrates	10.7g	3%	7.1g
Sugars	10.7g	12%	7.1g
Sodium	66mg	3%	44mg
Potassium	240mg		160mg
Folate eq	29ug	14%	19ug
Vitamin C	30mg	75%	20mg
Total polyphenols^	84mg GAE		56mg GAE
Beta-carotene eq	45ug		30ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

1. American Dietetic Association; Dietitians of Canada; American College of Sports Medicine, Rodriguez NR, Di Marco NM, Langley S. American College of Sports Medicine position stand. Nutrition and athletic performance. *Med Sci Sports Exerc.* 2009;41(3):709-731. doi:10.1249/MSS.0b013e31890eb886
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NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR HONEYDEW

Individual consumer friendly nutrient content and permitted general level health claims:

- Honeydews are vitamin C-rich with ¾ cup providing 75% of your daily vitamin C requirements. Vitamin C is a natural mood booster.
- Want to keep your brain functioning at its best? Eat ¾ cup of honeydew melon for 14% of your daily folate needs that supports psychological function.
- To keep your nerve impulses firing, eat honeydew melon. One serve provides 240mg potassium for healthy nerve function.
- Honeydew is your best summer energy source with one serve containing about 10g of natural fruit sugars.
- Beta-carotene is a colourful antioxidant that fights free radical damage (150g of honeydew melon contains 45ug).
- There are 84mg of polyphenol antioxidants in every 150g serve of honeydew melon. Polyphenols provide protection for all body cells.
- Honeydew melon is a great thirst quencher. It's 90% fluids and a great way to contribute to body hydration.

NUTRITION INFORMATION

Serving size: 150g (¾ cup raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	135g		90g
Energy	224kJ	3%	149kJ
Protein	1.1g	2%	0.7g
Total fat	0.5g	<1%	0.3g
Saturated fat	0g	0%	0g
Total Carbohydrates	10.7g	3%	7.1g
Sugars	10.7g	12%	7.1g
Sodium	66mg	3%	44mg
Potassium	240mg		160mg
Folate eq	29ug	14%	19ug
Vitamin C	30mg	75%	20mg
Total polyphenols^	84mg GAE		56mg GAE
Beta-carotene eq	45ug		30ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim PLUS HYDRATION:

- A healthy, varied diet containing a variety of fruit, vegetables and mushrooms contributes fluids to help hydration, and maintain brain function and mood.

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as honeydew, is good for mental wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Honeydew melon makes a refreshing snack or smoothie on a hot summer day. Whether enjoyed fresh or added to a fruit salad, honeydew delivers a range of nutrients that support a healthy, happy mind. Honeydews contain some 37 different phytochemicals a recent analysis found.¹ It is unknown what they all do but it's a good reason why we need to eat whole plant foods rather than pop pills – so we don't miss out on all the goodness plant foods have to offer.

A recent study involving a nationally representative sample of 12,385 Australian adults surveyed over several years reported that combined fruit and vegetable consumption was predictive of increased happiness, life satisfaction and wellbeing. These improvements were observed within 2 years.² Honeydew slices are a healthy sweet snack. Eating fruit as a snack compared to unhealthy snacks such as chocolate or crisps, was found to be associated with lower anxiety and emotional distress.³ So swap out your chocolate for honeydew and reap the rewards.

In general a healthy, varied diet high in fruit, such as honeydew, and vegetables is good for mental wellbeing and happiness. A review of 61 studies analysing the association between fruit and vegetable intake and mental health in adults found a high total intake of fruit and vegetables may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms. The authors concluded that fruit and vegetables have a positive influence on mental health and the general recommendation to consume at least 5 portions of fruit and vegetables a day may be beneficial for mental health.⁴

A review of 17 studies found an association between higher fruit and vegetable intake and better mental health in adolescents. The components of mental health assessed included health-related quality of life, mental health status, happiness and self-esteem as well as anxiety, stress and distress and depressive symptoms. The strongest benefits were found for fresh fruit and both green and yellow vegetables.⁵

Fresh fruit and vegetables also contain about 60-90% moisture so eating the recommended 2 serves of fruit and 5 serves of veg a day will contribute about 500-700ml of fluids to the body. Including a serve of honeydew in your day will add about 100ml to total fluids. Honeydew melon is super juicy, containing about 90% moisture that can contribute to your total body fluids, helping you to keep hydrated in the heat of summer. Getting enough fluids is important for brain function, emotional wellbeing and mood. Studies in adults' show just a small loss of body fluids (around 1%) is enough to increase negative emotions such as anger, confusion, tension, anxiety and depression while consuming fluids can improve cognitive function and mood.⁶

Deliciously scented and full of nutrients and juices, honeydew melon is packed with mood-boosting nutrients to make you feel like a jolly good melon!

References for substantiation

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5. Głabska D, Guzek D, Groele B, Gutkowska K. Fruit and vegetables intake in adolescents and mental health: a systematic review. *Rocz Panstw Zakl Hig*. 2020;71(1):15-25. doi:10.32394/rpzh.2019.0097 <https://pubmed.ncbi.nlm.nih.gov/32227780/>
6. Cousins AL, Young HA, Thomas AG, Benton D. The Effect of Hypo-Hydration on Mood and Cognition Is Influenced by Electrolyte in a Drink and Its Colour: A Randomised Trial. *Nutrients*. 2019;11(9):2002. doi:10.3390/nu11092002 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6769552/>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>
 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Honeydew and *Cucumis melo* var. *inodorus* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

29. KALE A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Stress less with kale. Stacked with vitamin C for psychological wellbeing.
- You won't need to bail with kale. The leaves are full-on folate to beat fatigue.
- Kale is numero uno for protecting body cells. Packed with antioxidants to fight free radicals.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Aussie /Australian kale.

Kale:

- ✓ Rich in vitamin C – psychological wellbeing
- ✓ Rich in folate – beat fatigue
- ✓ Rich in beta-carotene – antioxidant protection
- ✓ Source of niacin – brain function
- ✓ Source of vitamin B6 – nerve function
- ✓ Source of vitamin E – natural antioxidant
- ✓ Contains potassium – steady nerves
- ✓ Source of calcium – energy metabolism
- ✓ Source of magnesium – reduce stress
- ✓ Source of dietary fibre – gut health

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Kale fun facts:

- Kale is touted as the “hip” vegetable for the past five years. With its curly leaves, it's an unusual member of the *Brassica* family that looks like a cross between silverbeet and cabbage.
- It's with good reason kale has superfood status. Kale is highly nutritious with fibre, potassium, vitamins C, E, B6, folate, magnesium as well as calcium, which is unusual for a vegetable.
- If you don't like or can't eat dairy, kale is a good non-dairy calcium source with 113mg calcium in a cup. Just a little less than what's found in 100ml of milk.
- Kale has an impressive level of antioxidant carotenoid pigments including over 4000ug of beta-carotene as well as 12mg of lutein-zeaxanthin per serve which are needed for good eyesight.^{1,2}

NUTRITION INFORMATION

Serving size: 75g (1 cup raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	63g		84g
Energy	143kJ	2%	191kJ
Protein	3.2g	7%	4.3g
Total fat	<1g	<1%	<1g
Saturated fat	0g	0%	0g
Total Carbohydrates	3.9g	1%	5.2g
Sugars	1.7g	2%	2.3g
Dietary fibre	2.7g	9%	3.6g
Sodium	28.5mg	1%	38.0mg
Potassium	368mg		491mg
Niacin eq	1.7mg	17%	2.2mg
Folate eq	106ug	53%	141ug
Vitamin B6	0.2mg	13%	0.3mg
Vitamin C	90mg	225%	120mg
Vitamin E	1.2mg	12%	1.5mg
Calcium	113mg	14%	150mg
Magnesium	35.3mg	11%	47.0mg
Beta-carotene eq	4470ug		5950ug
Lutein- zeaxanthin^	11.8mg		15.7mg
Polyphenols^^	26mg		35mg

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

“<” means less than

References for website:

1. <https://www.aoa.org/patients-and-public/caring-for-your-vision/nutrition/lutein-and-zeaxanthin>
2. Rasmussen HM, Johnson EJ. Nutrients for the aging eye. *Clin Interv Aging*. 2013;8:741-748. doi:10.2147/CIA.S45399. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3693724/>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Phenol Explorer <http://phenol-explorer.eu/contents/food/276>

SUBSTANTIATION FOR KALE

Individual consumer friendly nutrient content and permitted general level health claims:

- Add a cup of kale to your smoothie or salad. You'll get a whopping 225% of your daily vitamin C needs, just what you need for emotional wellbeing.
- Kale is a great pick me up if you're feeling tired. With 106ug of folate in 75g serve (53% of your daily needs), it's a sure way to beat fatigue.
- Kale is a superfood super charged with the colourful carotenoid beta-carotene - an antioxidant to protect your body cells. Every a cup contains over 4000ug!
- Your brain will love it when you eat curly kale leaves. One serve contains 17% of daily niacin needs to support healthy brain function.
- Healthy nerve function is essential and eating a cup of kale provides 13% of vitamin B6 needs to keep nerves functioning well.
- Another antioxidant found in kale is vitamin E. With a 75g serve you'll get 12% of your daily needs giving natural protection against free radical damage.
- Potassium plays an essential role in activating nerve function. A cup of kale provides 368mg of potassium.
- Did you know kale is a source of calcium? In addition to ensuring strong bones and teeth, calcium also plays a role in making energy for your body and one serve contains 14% of your daily requirements.
- If you're feeling stressed, enjoy some kale. A cup is a source of magnesium, containing 11% of the RDI. Magnesium is needed for psychological function.
- Kale is a source of dietary fibre with nearly 3g per serve. Fibre will keep your gut healthy by feeding the good bacteria.

NUTRITION INFORMATION

Serving size: 75g (1 cup raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	63g		84g
Energy	143kJ	2%	191kJ
Protein	3.2g	7%	4.3g
Total fat	<1g	<1%	<1g
Saturated fat	0g	0%	0g
Total Carbohydrates	3.9g	1%	5.2g
Sugars	1.7g	2%	2.3g
Dietary fibre	2.7g	9%	3.6g
Sodium	28.5mg	1%	38.0mg
Potassium	368mg		491mg
Niacin eq	1.7mg	17%	2.2mg
Folate eq	106ug	53%	141ug
Vitamin B6	0.2mg	13%	0.3mg
Vitamin C	90mg	225%	120mg
Vitamin E	1.2mg	12%	1.5mg
Calcium	113mg	14%	150mg
Magnesium	35.3mg	11%	47.0mg
Beta-carotene eq	4470ug		5950ug
Lutein- zeaxanthin^	11.8mg		15.7mg
Polyphenols^^	26mg		35mg

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as kale, as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables, such as kale, is good for brightening your mood, brain function, psychological wellbeing and happiness.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

A green leafy vegetable that is always on the superfood list is kale - belonging to the *Brassica* family like broccoli, Brussel sprouts and cabbage.

Kale contains compounds such as polyphenols, carotenoids, glucosinolates and vitamins C and E that all show antioxidant activity.¹ It is widely accepted that food high in phytochemicals with antioxidant activity can help protect against free radicals. The red variety of curly kale also contains anthocyanin antioxidant pigments. Anthocyanins appear to have a protective effect on the brain through improvements on cognitive performance and memory.²

Vegetables from the *Brassica* family such as kale, contain beneficial phytonutrients called glucosinolates that are converted into isothiocyanates when kale is cut.³ Isothiocyanates show protective effects against cardiovascular disease, inflammatory disorders and brain degenerative diseases.⁴ Isothiocyanates are showing promising improvements for brain function.⁵ Oxidative stress and inflammation are commonly associated with the development of many diseases, including brain degenerative disorders. Isothiocyanates have double benefits as they have both antioxidant and anti-inflammatory activity.⁶

Dietary fibre is important for gut health as a prebiotic or food for gut bacteria. Having an optimal community of gut bacteria is also important for converting glucosinolates into isothiocyanates.⁷ Kale contains both fibre and glucosinolates – more powerful when working together. Diets high in fibre can optimise gut bacteria to positively impact psychological wellbeing as well. Short chain fatty acids such as butyrate and propionate directly affect brain physiology and behaviour by reducing brain inflammation and managing overall brain maintenance.⁸

A large analysis of 61 research studies found a high total intake of fruit and vegetables, and some specific subgroups such as green leafy vegetables, may promote higher levels of optimism and self-efficacy, as well as reduce levels of psychological distress.⁹ Self efficacy means having confidence in yourself and believing you can achieve. The same researchers found similar results for adolescents after assessing 17 studies. Those eating fruit and vegetables had greater psychological wellbeing, better self-esteem, happiness, were less stressed, had less depressive symptoms.¹⁰ Green vegetables in general have also been found as important for adolescent mental health. Consumption of green and yellow vegetables were associated with a reduced risk of depression^{11,12} and green vegetables were link with better behaviour scores in young people¹³.

Kale, like all other fruit and vegetables, certainly deserves the title of 'superfood'. Whether you prefer the green or purple varieties, the curlier or straighter leaves, just add a cup of these green leaves to your daily diet to enrich your body with loads of essential nutrients to support a good mood, a positive mind and a healthy body.

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3. Liu M, Zhang L, Ser SL, et al. Comparative Phytonutrient Analysis of Broccoli By-Products: The Potentials for Broccoli By-Product Utilization. *Molecules*. 2018;23(4):900. doi:10.3390/molecules23040900 [https://pubmed.ncbi.nlm.nih.gov/29652847/#:~:text=The%20phytonutrient%20concentrations%20of%20broccoli%20\(Brassica%20oleracea%20var.&text=Broccoli%20florets%20had%20higher%20concentrations,phenolic%20content%20C%20and%20antioxidant%20activity.](https://pubmed.ncbi.nlm.nih.gov/29652847/#:~:text=The%20phytonutrient%20concentrations%20of%20broccoli%20(Brassica%20oleracea%20var.&text=Broccoli%20florets%20had%20higher%20concentrations,phenolic%20content%20C%20and%20antioxidant%20activity.)
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NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>
 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>
 ^^Phenol Explorer <http://phenol-explorer.eu/contents/food/276>

SEARCH TERMS USED FOR PUBMED: Kale and *Brassica oleracea* L. var. *acephala* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

30. LEEK A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Feeling bleak? Grab a leek! With mood boosting vitamin C.
- Reach your peak with leeks - vitamin C for feeling good.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/Aussie leeks.

Leek:

- ✓ Rich in vitamin C – boost mood
- ✓ Source of fibre – healthy gut
- ✓ Contains beta-carotene – antioxidant protection
- ✓ Contains moisture – helps hydration

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Leek fun facts:

- Leek is a member of the *Allium* genus with garlic and various onions.
- Fried leeks make a crisp, interesting garnish for bowls of Asian noodles or simple risottos. When cooked slowly with butter they develop a subtle savoury sweetness which brings more flavour to potato, pasta, sausages and fish.
- Vichyssoise is a happy marriage between leeks and potato and the gentle sweetness of this luscious soup will tease your taste buds.
- Leeks contain unique flavonoid antioxidant kaempferol, which has antioxidant and anti-inflammatory properties.¹
- Leeks, like most green leafy vegetables, contain vitamin K, an essential nutrient to help blood to clot and bones to develop.²

NUTRITION INFORMATION

Serving size: 75g (1/2 cup, boiled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	68g		90g
Energy	113kJ	1%	151kJ
Protein	1.7g	4%	2.3g
Total fat	0.3g	<1%	0.4g
Saturated fat	0g	0%	0g
Total Carbohydrates	3.1g	1%	4.1g
Sugars	3.1g	3%	4.1g
Dietary fibre	2.6g	9%	3.4g
Sodium	14mg	<1%	18mg
Vitamin C	18.8mg	47%	25mg
Vitamin K [#]	13.2ug	17%	17.6ug
Beta-carotene eq	206ug		275ug
Kaempferol ^{^^}	2mg		2.7mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" = less than

References for website:

1. Dabeek WM, Marra MV. Dietary Quercetin and Kaempferol: Bioavailability and Potential Cardiovascular-Related Bioactivity in Humans. *Nutrients*. 2019;11(10):2288. doi:10.3390/nu11102288
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6835347/>
2. <https://www.nrv.gov.au/nutrients/vitamin-k>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL
<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Dabeek WM, Marra MV. Dietary Quercetin and Kaempferol: Bioavailability and Potential Cardiovascular-Related Bioactivity in Humans. *Nutrients*. 2019;11(10):2288. doi:10.3390/nu11102288
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6835347/>

SUBSTANTIATION FOR LEEK

Individual consumer friendly nutrient content and permitted general level health claims:

- Cook up half a cup of leek leaves and stalks. You'll get nearly half (47%) of your daily vitamin C needs for a good mood and a healthy mind. Vitamin C contributes to psychological wellbeing.
- Feed your gut leeks. A 75g serve of cooked leeks provides nearly 3g of fibre needs to feed the healthy gut bacteria.
- Beta-carotene is a natural antioxidant pigment that helps protect body cells. Half a cup of cooked leeks provides 206ug.
- With 90% moisture leeks contribute fluids to the body to aid hydration.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim PLUS HYDRATION:

- A healthy, varied diet containing a variety of fruit, vegetables such as leeks and mushrooms contributes fluids to help hydration, and maintain brain function and mood.

NUTRITION INFORMATION

Serving size: 75g (1/2 cup, boiled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	68g		90g
Energy	113kJ	1%	151kJ
Protein	1.7g	4%	2.3g
Total fat	0.3g	<1%	0.4g
Saturated fat	0g	0%	0g
Total Carbohydrates	3.1g	1%	4.1g
Sugars	3.1g	3%	4.1g
Dietary fibre	2.6g	9%	3.4g
Sodium	14mg	<1%	18mg
Vitamin C	18.8mg	47%	25mg
Vitamin K [#]	13.2ug	17%	17.6ug
Beta-carotene eq	206ug		275ug
Kaempferol ^{^^}	2mg		2.7mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" = less than

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables, such as leeks, is good for brightening your mood, brain function, psychological wellbeing and happiness.

Subcategory COOKING claim:

- Cooked leeks adds a subtle flavour to such a wide variety of dishes. Cooking together has positive effects on wellbeing and quality of life.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Leeks are sometimes referred to as poor man's asparagus. There is nothing poor about this nutritious vegetable that not only has extensive culinary uses, but as a vegetable can also help to boost mood and keep you healthy. Read on to find out how...

A review of 61 studies analysing the association between fruit and vegetable intake and mental health in adults found a high total intake of fruit and vegetables (including green leafy vegetables) may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms. The authors concluded that fruit and/or vegetables have a positive influence on mental health and the general recommendation to consume at least 5 portions of fruit and vegetables a day may be beneficial for mental health.¹

Another review of 17 studies found an association between higher fruit and vegetable intake and better mental health in adolescents. The components of mental health assessed included health-related quality of life, mental health status, happiness and self-esteem as well as anxiety, stress and distress and depressive symptoms. The strongest mental health benefits were found for green vegetables, yellow vegetables and fresh fruit.² So get your greens in with a serve of leeks!

As leeks are such a versatile food and can be enjoyed raw or cooked, they are a great way to increase your daily vegetable intake. A study of young adults found consuming 7-8 servings of fruit and vegetables predicted greater positive moods such as joy, interest, and alertness on the day they ate them, and the day afterward. The authors concluded eating fruit and vegetables may promote emotional wellbeing in healthy young adults and have a longer lasting effect.³

Leeks, like most fruit and vegetables, are high in fluids content so eating the recommended 2 serves of fruit and five serves of veg a day will contribute about 500-700ml of fluids to the body. The brain contains 75% water and water loss can affect brain function.⁴ Dehydration is a reliable predictor of impaired cognition as dehydration is thought to effect energy production in brain cells, reduce transmitters involved in learning and memory. These can also occur with aging.⁵

When it comes to cooking leeks, the sky's the limit. Why not slice leeks and cook in some olive oil until tender to accompany a fish or meat dish, or fold sautéed leeks into a scrambled egg mixture. For a tasty, savoury weekend lunch, make a chicken pie— cook chunks of chicken and leeks in a frying pan, add some skim milk and light cream, toss in chopped parsley, season and transfer the mixture to pastry shells for baking.

Cooking new recipes is fun and you will benefit from the good mood effects of cooking. A systematic review of 377 studies suggests that cooking interventions may positively influence psychosocial outcomes and yield positive influences on socialisation, self-esteem and quality of life.⁶

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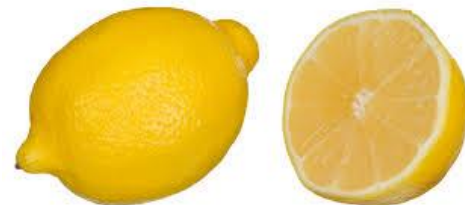
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SEARCH TERMS USED FOR PUBMED: Leek and *Allium ampeloprasum* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

31. LEMON A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key messages:

- When life sucks, take lemon-aid! Lemons are rich in vitamin C which supports mental wellness.
- Lemons enliven the senses and energise the body thanks to their fatigue-fighting vitamin C.
- Life without lemons is just too sad to contemplate. Embrace their exciting flavour, uplifting colour and clever versatility for a brighter outlook on life.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie lemons.

Lemon:

- ✓ Rich in vitamin C – mental wellness
- ✓ Source of fibre – happy gut
- ✓ Contains polyphenol – antioxidant cell protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity)

Lemon fun facts:

- Lemons are available all year round- you can rely on them for a boost any time.
- The average lemon contains 3 tablespoons of juice and 8 seeds.
- Lemon juice with honey is good for a sore throat, and the lemon is a natural antibacterial.¹
- Lemons used to be so rare and special that royalty gave them to each other as gifts.
- Cleanse the palette with a refreshing lemon sorbet between courses.

NUTRITION INFORMATION

Serving size: 100g (1 lemon raw)

	Av QTY Per serve	%DI*
Moisture	89g	
Energy	115kJ	1%
Protein	0.6g	1%
Total fat	0.2g	<1%
Saturated fat	0g	0%
Total Carbohydrates	1.8g	1%
Sugars	1.8g	2%
Dietary fibre	2.5g	8%
Sodium	2mg	<1%
Vitamin C	48mg	120%
Total polyphenols [^]	51mgGAE	

Source: Aust Food Comp Data or [^] USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

- 1 Mshelia BM, Adeshina GO, Onaolopo JA. The Antibacterial Activity of Honey and Lemon Juice against *Streptococcus pneumoniae* and *Streptococcus pyogenes* Isolates from Respiratory Tract Infections. *ACTA Scientific Microbiology* 2018;1(3):22-27 <https://actascientific.com/ASMI/pdf/ASMI-01-0023.pdf>

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[^]USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR LEMON

Individual consumer friendly nutrient content and permitted general level health claims:

- One lemon (100g) provides the entire daily recommended amount of vitamin C and then some (120% of the RDI). Vitamin C is needed for mental wellness – both psychological and nervous system functions.
- Lemons are also natural energisers. One lemon contains 120% of the daily amount of vitamin C to help beat tiredness and fatigue.
- One medium lemon contains 3g of gut-loving fibre.
- One lemon contains 50mg polyphenol antioxidants for cell protection.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as lemons, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as lemons is good for mental wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 100g (1 lemon raw)

	Av QTY Per serve	%DI*
Moisture	89g	
Energy	115kJ	1%
Protein	0.6g	1%
Total fat	0.2g	<1%
Saturated fat	0g	0%
Total Carbohydrates	1.8g	1%
Sugars	1.8g	2%
Dietary fibre	2.5g	8%
Sodium	2mg	<1%
Vitamin C	48mg	120%
Total polyphenols^	51mgGAE	

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Life without lemons is just too sad to contemplate. So versatile, so delicious, so beautiful, and so good for your mental wellbeing.

Interesting compounds in lemons

Lemons are a good source of polyphenols.¹ The main polyphenol found in lemons is eriocitrin. It is a potent antioxidant, which in animal studies, has shown anti-aging effects including preservation of brain function and improvements in the intestinal microbiome (community of microbes in the gut).² Lemons also contain the antioxidant flavanones eriodictyol and naringenin.³

Lemons are rich in vitamin C which is also important in the antioxidant defence of cells. Having higher intakes of vitamin C is associated with better cognitive function in older people and the association is stronger for food sources than supplements.⁴

The flavonoids in citrus fruit have great potential to protect the brain and nervous system and reverse age-related declines in memory and learning.⁵

A review of diets, food and food components found antioxidant polyphenols in citrus may contribute to improvements in inflammation, endothelial (blood vessel) function and oxidative stress after a meal.⁶

Fruit and vegetables, mental health, psychological wellbeing and mood

A review of 61 studies analysing the association between fruit and vegetable intake and mental health in adults found a high intake of fruit and vegetables, and citrus fruit in particular, may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against feeling depressed. The authors concluded that total fruit and/or vegetable intake, and citrus fruit intake specifically, have a positive influence on mental health.⁷

A study in young adults found raw fruit and vegetable intake predicted reduced depressive symptoms and higher positive mood, life satisfaction, and flourishing. The top 10 raw foods related to better mental health included citrus fruit.⁸

In both adults and children, emerging evidence suggests that increased fruit intake improves psychological wellbeing.⁹ Particular fruits including citrus may play a role in maintaining brain health and reducing cognitive decline.¹⁰

References for substantiation

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Lemon or *citrus limon* and [mood/ psychological/brain/ wellbeing/ cognition/ antioxidants]

32. LIME A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Embrace the sublime; grab a lime (or two). Limes are chock-full of flavour, vitamin C for energy and vitality.
- Invigorate your meals and your day with limes. Their vitamin C energises your body and mind and their exotic and refreshing flavour and aroma lifts your spirits.
- Limes are always up for a good time. Their exciting taste and vitamin C energises and uplifts body and mind.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie limes.

Lime:

- ✓ Rich in vitamin C – energy and vitality
- ✓ Good source of fibre – happy gut

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Lime fun facts:

- Limes are savoured for their acidity and the floral aroma of their zest.¹
- Limes are used a lot in the traditional cuisines of Thailand, Vietnam and Mexico.¹
- Lime pickle is a traditional Indian condiment used to enliven rice, naan bread, pappadums and curries.
- Lime zest is too good to waste – use a microplane (or fine grater) to remove the zest before cutting and use it to rev up the lime flavour of your dish or drink. And do breathe in the scent: aromatherapists say lime essential oil can purify and renew the spirit and the mind!²
- Lime juice is the key ingredient in several alcoholic cocktails including the Margarita and the mojito (adults only, and in moderation please!).

NUTRITION INFORMATION

Serving size: 100g (2 limes raw)

	Av QTY Per serve	%DI*
Moisture	88g	
Energy	122kJ	1%
Protein	0.8g	2%
Total fat	0.2g	<1%
Saturated fat	0g	0%
Total Carbohydrates	1.2g	<1%
Sugars	1.2g	1%
Dietary fibre	4.1g	14%
Sodium	3mg	<1%
Vitamin C	47mg	118%
Total polyphenols [^]	12mg GAE	

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

- 1 [https://en.wikipedia.org/wiki/Lime_\(fruit\)](https://en.wikipedia.org/wiki/Lime_(fruit))
- 2 <https://www.aromaweb.com/essential-oils/lime-oil.asp>

NIP nutrient composition database references

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[^]USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR LIME

Individual consumer friendly nutrient content and permitted general level health claims:

- Limes invigorate the mind and body. Two limes (100g) contain 118% of the recommended daily amount of vitamin C. Vitamin C is important for proper functioning of nervous system, psychological function and reducing tiredness and fatigue.
- Limes are a good source of gut loving fibre with 4g between two limes.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as limes, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory FRUIT claim:

- Brighten your diet and your day with limes. A healthy, varied diet high in fruit such as limes is good for mental wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 100g (2 limes raw)

	Av QTY Per serve	%DI*
Moisture	88g	
Energy	122kJ	1%
Protein	0.8g	2%
Total fat	0.2g	<1%
Saturated fat	0g	0%
Total Carbohydrates	1.2g	<1%
Sugars	1.2g	1%
Dietary fibre	4.1g	14%
Sodium	3mg	<1%
Vitamin C	47mg	118%
Total polyphenols^	12mg GAE	

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Limes are exotic, invigorating and always up for a good time. They're smart and social - here's the science behind their story.

Interesting compounds in limes

Limes contain polyphenols¹, which in animal studies have shown anti-aging effects including preservation of cognitive function and improvements in intestinal microbiome (the community of microbes in the gut)². The main polyphenols found in limes are hesperidin and eriocitrin and these are potent antioxidants. Hesperidin from citrus has antioxidant and anti-inflammatory effects and this is good because inflammation is involved in the development of degenerative brain disorders.³

Limes are rich in vitamin C which is important in the antioxidant defence of cells. Having higher intakes of vitamin C is associated with better cognitive function in older people and the association is stronger for food sources than supplements.⁴

Interesting compounds in citrus

Citrus fruits are rich in polyphenols, particularly flavonoids, and these give them their enticing colours and aromas. These flavonoids have antioxidant and anti-inflammatory effects. There are many types of flavonoids in citrus fruit: flavanones, flavones, flavonols and in some cases anthocyanins, flavanols and the chalcones.

The most common flavones found in citrus fruit and juices are apigenin, diosmetin, luteolin, acacetin, chrysoeriol (don't you just love the chemical names). They show antioxidant, anti-inflammatory, antiviral, antimicrobial, and anticancer activities.⁵ Flavanones have anti-inflammatory effects⁶ and diets with low inflammatory potential are associated with better mental health⁷. Citrus flavonoids are thought to have protective effects on the brain and nervous system⁸ and reverse age-related declines in memory and learning.⁹

A review of diets, food, nutrients and bioactives found antioxidant polyphenols in citrus may contribute to improvements in inflammation, endothelial (blood vessel) function and oxidative stress after a meal.¹⁰

Fruit and vegetables, mental health, psychological wellbeing and mood

A review of 61 studies analysing the association between fruit and vegetable intake and mental health in adults found a high intake of fruit and vegetables and citrus fruit in particular may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against feeling depressed. The authors concluded that total fruit and/or vegetable intake, as well as citrus fruit intake specifically, have a positive influence on mental health.¹¹

A study in young adults found raw fruit and vegetable intake predicted reduced depressive symptoms and higher positive mood, life satisfaction, and flourishing. The top 10 raw foods related to better mental health included citrus fruit.¹²

In both adults and children, emerging evidence suggests that increased fruit intake could improve psychological wellbeing.¹³ Particular fruits including citrus may play a role in maintaining brain health and reducing cognitive decline.¹⁴

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SEARCH TERMS USED FOR PUBMED: Lime or *citrus latifolia* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/ citrus antioxidants/citrus phytochemical]

33. LYCHEE A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Say ly-chees and smile! Lychees are bursting with vitamin C for your emotional wellbeing.
- Stay in the pink with lychees. Their powerful polyphenols will help maintain your mind and mood.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie lychees.

Lychee:

- ✓ Rich in vitamin C – emotional wellbeing
- ✓ Contains polyphenols – brain maintenance
- ✓ Contains carotenoids - antioxidant protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Lychee fun facts:

- Lychees originated in China and were considered a delicacy by the Imperial Court.¹
- The lychee has been called the 'king of fruit'.²
- Lychees are berries and are also known as Chinese cherries³. They're delicious eaten straight out of the shell but they also make fantastic slushies, and take your fruit salad from great to amazing.
- Did you know you can freeze lychees in their shell? Or store in the fridge for up to a week, in a bag to preserve moisture.
- Surprisingly, the peel and seed also contain beneficial substances with antioxidant, cancer preventive, antimicrobial, and anti-inflammatory functions.³

NUTRITION INFORMATION

Serving size: 100g (7-8 lychees raw)

	Av QTY Per serve	%DI*
Moisture	81g	
Energy	296kJ	3%
Protein	1.1g	2%
Total fat	<1g	<1%
Saturated fat	0g	0%
Total Carbohydrates	16.2g	5%
Sugars	16.2g	18%
Sodium	1mg	<1%
Vitamin C	49mg	123%
Total polyphenols^	222mg GAE	
Beta-carotene eq Carotenoids^^	571ug	

Source: Aust Food Comp Data or ^ USDA

^^Emanuele 2017

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

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FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^ Emanuele S, Lauricella M, Calvaruso G et al. Litchi chinensis as a Functional Food and a Source of Antitumor Compounds: An Overview and a Description of Biochemical Pathways. *Nutrients*. 2017;9(9):992. doi:10.3390/nu9090992 <https://pubmed.ncbi.nlm.nih.gov/28885570/>

SUBSTANTIATION FOR LYCHEE

Individual consumer friendly nutrient content and permitted general level health claims:

- 7-8 lychees (100g) provides more than an entire day's recommended amount of vitamin C needed for psychological and emotional wellbeing.
- Lychees contain 223mg of antioxidant polyphenols that quell free radicals and oxidative stress.
- Lychees contain 570ug carotenoid antioxidants to protect your brain and nervous system against oxidative stress so you think well and feel well.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as lychee, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as lychee is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 100g (7-8 lychees raw)

	Av QTY Per serve	%DI*
Moisture	81g	
Energy	296kJ	3%
Protein	1.1g	2%
Total fat	<1g	<1%
Saturated fat	0g	0%
Total Carbohydrates	16.2g	5%
Sugars	16.2g	18%
Dietary fibre	1.3g	4%
Sodium	1mg	<1%
Vitamin C	49mg	123%
Total polyphenols [^]	222mg GAE	
Beta-carotene eq Carotenoids ^{^^}	571ug	

Source: Aust Food Comp Data or ^ USDA

^{^^}Emanuele 2017

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

You'll feel in the pink, when you devour these lovely little lychee fruits. Cherish the white, juicy, ball of firm jelly-like flesh with its sweet, tropical flavour and aroma. They're bursting with goodness that will help boost your mood.

The clever composition of lychees

Lychees have a long list of beneficial compounds that have antioxidant, anti-inflammatory, anti-microbial and anti-cancer activities. They contain bioactive polysaccharides with antioxidant activity, and significant amounts of antioxidant polyphenols including gallic acid, chlorogenic acid, catechin, caffeic acid, epicatechin, quercetin and rutin. Oliganol is a polyphenol that has shown favourable effects against chronic diseases including Alzheimer's Disease.¹ This smorgasbord of beneficial components is great news because lychees have potential to boost mood via several different mechanisms. In summary, lychees help keep your brain and nervous system neat, tidy and working well.

A study in France found that lychee has the second highest antioxidant polyphenol content just behind strawberry.² A US research paper on the antioxidant potential of tropical fruit in Florida found lychee to have the fourth highest antioxidant potential of the 13 tropical fruit tested.³

The antioxidant power of lychees is important for mental health and wellbeing because the brain is considered highly susceptible to oxidative stress, which is implicated in depression, anxiety and emotional stress as well as degenerative brain diseases.⁴ The anti-inflammatory effects of the beneficial compounds in lychees can help mental wellbeing because chronic systemic inflammation is linked with poor mental health^{5,6} and diets high in anti-inflammatory foods reduce the risk of depression.⁷

Why enjoying fruit such as lychees will help you feel good

Lychees are pretty to look at and fun to eat so they are a winner with kids. And lychees can do more than brighten the lunch box. An Australian Health and Wellbeing study of 3,370 children in Victoria observed that children with a higher number of daily fruit servings were more likely to have emotional control, problem management and relationship building skills.⁸ And no matter what your age, you'd be better off choosing fruit as a snack. One study found eating fruit as a snack compared to 'sometimes food' such as chocolate or potato crisps, was associated with lower anxiety and emotional distress.⁹ And as we get older, enjoying fruit such as lychees regularly may help us hang on to our cognition for longer. The flavonoids found in fruit may improve cognition and reverse age-related declines in memory and learning.¹⁰

Enjoy a plant-rich diet for a better mood

We all know fruit and vegetables are good for us and now we have another reason to add to the reasons - to feel happier. Scientific evidence suggests that the health benefits of fruit, vegetables, and other plant foods on psychological wellbeing are due to many bioactive compounds (such as antioxidants) and other nutrients in whole foods working together to deliver healthy brain function.¹¹ An Australian study assessing food diaries and surveys of 12,385 Australian adults found increased fruit and vegetable consumption predicted increased happiness, life satisfaction and wellbeing. The increase in life satisfaction from the highest increase in fruit and vegetable consumption (8 portions a day) over the period of two years was equal to the psychological gain of moving from unemployment to employment.¹²

Don't forget to 'Go for 2 n 5' (eat 2 fruit and 5 vegies a day) to brighten your outlook on life. Lychees are a fun one to add into the mix.

References for substantiation

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SEARCH TERMS USED FOR PUBMED: Lychee and/or litchi and/or <i>Litchi chinensis</i>
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34. MACADAMIA A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Get an energising spark from a handful of macadamias. They're rich in manganese.
- Macadamias will make you feel better, happier and healthier. They contain niacin.

Campaign taglines:

- Eat on the Bright side. Naturally) boost your mood with Australian Macadamias.

Macadamia:

- ✓ Rich in manganese – energy production
- ✓ Source of niacin – positive mood
- ✓ Source of healthy monounsaturated fats – healthy hearts

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity page)

Macadamia fun facts:

- Australia's first native fun food – Aboriginal people have been enjoying macadamias, grown on the east coast of Australia, for over 60,000 years.
- One of the highest plant sources of heart healthy monounsaturated fat (80% of total fats).
- One to two handfuls of macadamias (30-60g) a day help reduce total and LDL cholesterol.¹⁻³
- Nuts such as macadamias help control appetite and prevent weight gain.^{4,5}
- Try a little Aussie spice with your macadamias - add lemon myrtle and native pepper.

References for website:

- 1) Del Gobbo LC, Falk MC, Feldman R, Lewis K, Mozaffarian D. Effects of tree nuts on blood lipids, apolipoproteins, and blood pressure: systematic review, meta-analysis, and dose-response of 61 controlled intervention trials. *Am J Clin Nutr.* 2015;102(6):1347-1356. doi:10.3945/ajcn.115.110965 <https://academic.oup.com/ajcn/article-pdf/102/6/1347/23757889/ajcn110965.pdf>
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NIP nutrition Composition database references

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

NUTRITION INFORMATION

Serving size: 30g (15 macadamias raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	0.5g		1.6g
Energy	905kJ	10%	3020kJ
Protein	2.8g	6%	9.2g
Total fat	22.2g	32%	74g
Saturated fat	3g	13%	10g
Monounsaturated fat	17.9g		59.6g
Polyunsaturated fat	0.3g		1.1g
Total Carbohydrates	1.4g	<1%	4.5g
Sugars	1.4g	2%	4.5g
Sodium	0.3mg	<1%	1mg
Niacin eq	1.2mg	12%	4.1mg
Manganese	1.5mg	31%	5.1mg
Total polyphenols^	47mg GAE		156mg GAE

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

SUBSTANTIATION FOR MACADAMIA

Individual consumer friendly nutrient content and permitted general level health claims:

- Macadamias are rich in manganese for an energising spark. About 15 macadamias will provide a third of your daily manganese needs. Manganese is needed for energy production.
- Niacin is needed for psychological wellbeing and a positive mood. A 30g handful of macadamias provides 12% of the RDI. Niacin can also reduce tiredness and fatigue because it aids energy production.
- Macadamias are one of the richest plant sources of healthy monounsaturated fats (80% of total fat). These healthy plant fats play a role in heart health.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity)

Subcategory NUT claim:

- Nuts: Happiness in a handful. A healthy, varied diet containing a variety of nuts such as macadamias is good for brain function and psychological wellbeing – putting you in happy mood.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 30g (15 macadamias raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	0.5g		1.6g
Energy	905kJ	10%	3020kJ
Protein	2.8g	6%	9.2g
Total fat	22.2g	32%	74g
Saturated fat	3g	13%	10g
Monounsaturated fat	17.9g		59.6g
Polyunsaturated fat	0.3g		1.1g
Total Carbohydrates	1.4g	<1%	4.5g
Sugars	1.4g	2%	4.5g
Sodium	0.3mg	<1%	1mg
Niacin eq	1.2mg	12%	4.1mg
Manganese	1.5mg	31%	5.1mg
Total polyphenols^	47mg GAE		156mg GAE

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

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Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Macadamias are nutrient-rich all round nice guys that may just help smooth out the rough patches. There's plenty of evidence to show that nuts such as macadamias play a vital role in psychological wellbeing. Yes loving the moreish smooth flavour and creamy crunch of macadamias makes all macadamia lovers happy but we're talking about how nuts may change the way the brain operates.

An Australian Mediterranean diet study of 85 people found after 6 months those eating more nuts had a greater reduction in depression and improved mental health scores.¹ The Australian SMILES trial with 67 participants found improvements in ratings of depression after 12 weeks of a special diet which included a daily serving of nuts.² A larger study of some 13,600 people found those eating nuts at least one a week had an 18% reduction in depression risk compared to those eating nuts less than once a week.³ And when things get tough nuts help reduce anxiety. Men enjoying higher amounts of nuts and were 66% less anxious than low nut eaters.⁴ It's not just the nutrients that nuts contain that help brain function but they also influence brain signalling systems that regulate mood. Nuts contain the amino acid tryptophan which is needed by the brain to make the happy hormone serotonin.⁵

Eating nuts regularly improves your brain function and cognition – your ability to process information and experiences, memory, attention, problem-solving, and decision-making. A review by University of South Australia researchers, of more than 70 studies, found that a 30g handful of nuts enjoyed daily

may improve mental processes such as memory, problem solving and decision making. It may be nuts' ability to reduce inflammation and improve brain blood flow that's key to blowing the brain fog away.⁶

The more nuts you eat and the longer you eat them is, the better the results. Another research group found in just over 2,600 adults, aged 43-70 years who consumed nuts for five years, there was a significant link to improved cognitive function (memory, speed, flexibility) with no cognitive decline over this time.⁷

Healthy hearts = healthy brains

How nuts such as macadamias has this effect may have to do with the unique combination of nutrients such as healthy monounsaturated fats, antioxidant vitamins and minerals, and phytochemicals with antioxidant and anti-inflammatory properties. These compounds help keep hearts healthy by protecting blood vessels so may help protect brain function and its blood vessels too.⁴ Recent research has found healthy monounsaturated fats have a role to play cognition, memory and mood too.^{8,9} Macadamias are one of the richest plant sources of healthy monounsaturated fats with 80% of total fat as monounsaturated fats.

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- 9 Kien CL, Bunn JY, Tompkins CL, et al. Substituting dietary monounsaturated fat for saturated fat is associated with increased daily physical activity and resting energy expenditure and with changes in mood. *Am J Clin Nutr*. 2013;97:689-97. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3607650/pdf/ajcn974689.pdf>

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Macadamia or *Macadamia integrifolia* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

35. MANDARIN A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Keep joy handy; grab a mandi. Mandarins are loaded with vitamin C to help you feel good.
- Mandarins are full of fun. They contain folate for energy and a positive outlook.
- Mandarins are sweet and juicy providing natural sugars and hydration for a happy brain.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie mandarins.

Mandarin:

- ✓ Rich in vitamin C – mental fitness
- ✓ Source of folate - energy
- ✓ Source of fibre – happy gut
- ✓ Contains potassium – steady nerves
- ✓ Contains beta-carotene – antioxidant protection
- ✓ Contains natural sugars – brain fuel
- ✓ Contains moisture – helps hydration

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Mandarin fun facts:

- Mandarins originated in China and the word mandarin comes from the orange robes worn by officials in the ancient Chinese court.
- Mandarins are sunshine in winter a fruit that's easy to peel.
- Mandarins contain natural sugars that provide fuel for the brain and body. The brain prefers glucose as fuel that it gets from carbohydrates in food, such as sugars in mandarins.¹
- Mandarins are super juicy (86% moisture) which provides a refreshing source of hydration for a sharp functioning brain.²

NUTRITION INFORMATION

Serving size: 150g (2 small mandarins raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	129g		86g
Energy	293kJ	3%	195kJ
Protein	1.4g	3%	0.9g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	14.7	5%	9.8g
Sugars	14.7g	16%	9.8g
Dietary fibre	2.4g	8%	1.6g
Sodium	4mg	<1%	3mg
Potassium	270mg		180mg
Folate eq	39ug	20%	26ug
Vitamin C	42mg	105%	28mg
Total polyphenols^	46mg GAE		31mg GAE
Beta-carotene eq	594ug		396ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

- 1 Berg JM, Tymoczko JL, Stryer L. Biochemistry. 5th edition. New York: W H Freeman; 2002. Section 30.2, Each Organ Has a Unique Metabolic Profile. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK22436/>
- 2 Liska D, Mah E, Brisbois T, et al. Narrative Review of Hydration and Selected Health Outcomes in the General Population. *Nutrients*. 2019;11(1):70. doi:10.3390/nu11010070 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6356561/>

NIP nutrient composition database references

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR MANDARIN

Individual consumer friendly nutrient content and permitted general level health claims:

- Two small mandarins (150g) provide your entire day's recommended intake of vitamin C. Vitamin C is needed for mental fitness (psychological and nervous system function).
- Two small mandarins (or one large) contains one fifth the recommended daily amount of the B-vitamin folate. Folate is important for energy production, reducing tiredness and fatigue as well as psychological function.
- Mandarins contain 270mg potassium for the normal functioning of the nervous system.
- There is 2g of fibre in two mandarins. Fibre needed for a healthy gut and a happy gut microbiome.
- The gorgeous orange colour of mandarins is thanks to beta-carotene – an antioxidant pigment with two mandarins containing just under 600ug.
- Two mandarins contain 15g of natural fruit sugars a form of brain fuel.
- Two juicy mandarins contain about 130ml of moisture that helps to contribute to body hydration.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

NUTRITION INFORMATION

Serving size: 150g (2 small mandarins raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	129g		86g
Energy	293kJ	3%	195kJ
Protein	1.4g	3%	0.9g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	14.7	5%	9.8g
Sugars	14.7g	16%	9.8g
Dietary fibre	2.4g	8%	1.6g
Sodium	4mg	<1%	3mg
Potassium	270mg		180mg
Folate eq	39ug	20%	26ug
Vitamin C	42mg	105%	28mg
Total polyphenols^	46mg GAE		31mg GAE
Beta-carotene eq	594ug		396ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as mandarins, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as mandarins is good for mental wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Mandarins are sweet, juicy and full of fun. Here are some enlightening facts about what's inside their glorious orange skin.

Interesting compounds in mandarins

Mandarins are a citrus fruit that are known for their polyphenol antioxidants, specifically a type of flavanone called hesperidin.¹ The other predominant flavanone in mandarins is narirutin.² Flavanones also have anti-inflammatory effects³ and this is good news because diets with low inflammatory potential are associated with better mental health.⁴

Mandarins are rich in vitamin C which is important in the antioxidant defence of cells. Having higher intakes of vitamin C is associated with better cognitive function in older people (learning, processing and memory). The association is stronger for food sources than supplements.⁵

Hydration and mood

Mandarins are juicy, containing 86% moisture that can contribute to total body fluids. Getting enough fluids is important for brain function, emotional wellbeing and mood. Studies in adults' show just a small loss in body fluids (around 1%) can increase negative emotions such as anger, confusion, tension, anxiety and depression, while consuming fluids can improve cognitive function and mood.⁶

Interesting compounds in citrus

A review of diets, food and compounds in foods found antioxidant polyphenols in citrus may contribute to improvements in inflammation, endothelial function (elastic blood vessels for better blood flow) and oxidative stress after a meal.⁷ These all have a role to play in aging and chronic diseases.

Citrus fruit in general contain many polyphenol antioxidants, particularly flavonoids, and these give citrus their enticing colours and unique flavours and aromas. These flavonoids have antioxidant and anti-inflammatory effects. There are different varieties of flavonoids too. In citrus fruit flavonoids include: flavanones, flavones, flavonols and in some cases anthocyanins, flavanols and the chalcones. The most common flavones found in citrus fruit and juices are apigenin, diosmetin, luteolin, acacetin, chrysoeriol and they show antioxidant and anti-inflammatory effects.⁸ Citrus flavonoids are thought to have protective effects on the nervous system.⁹

The flavonoids in citrus fruit have great potential to protect the brain and nervous system and reverse age-related declines in memory and learning.¹

Fruit and vegetables, mental health, psychological wellbeing and mood

A review of 61 studies analysing the association between fruit and vegetable intake and mental health in adults found a high total intake of fruit and vegetables, and citrus fruit in particular, may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress and ambiguity, and protect against depressive symptoms. The authors concluded that total fruit and/or vegetable intake, as well as citrus fruit intake specifically, have a positive influence on mental health.¹⁰

A study in young adults found raw fruit and vegetable intake predicted reduced depressive symptoms and higher positive mood, life satisfaction, and flourishing. The top 10 raw foods related to better mental health included citrus fruit.¹¹

In both adults and children, emerging evidence suggests that increased fruit intake may improve psychological wellbeing.¹² Particular fruit including citrus may play a role in maintaining brain health and reducing cognitive decline in older adults.¹³

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 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Mandarin and/or *Citrus reticulata* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]



36. MANGO A GOOD MOOD FOOD

WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Calm the mango madness with vitamin C-rich mangoes – the tropical good mood food.
- Go you good thing – mangoes contain folate to fight fatigue.
- Gett'in cheeky w it! Mangoes contain vitamin E for antioxidant defence and to fight free radicals.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie mango.

Mango:

- ✓ Rich in vitamin C – psychological wellbeing
- ✓ Source of folate – fights fatigue
- ✓ Source of vitamin E – antioxidant defence
- ✓ Contain polyphenols - antioxidant protection
- ✓ Contain beta-carotene - antioxidant orange pigment
- ✓ Contain lutein/zeaxanthin - antioxidant yellow pigment
- ✓ Source of fibre – healthy gut function
- ✓ Contains natural fruit sugars – fuel to get up and go
- ✓ Contain Low GI carbs - longer lasting energy
- ✓ Contains potassium – nervous system

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Mango fun facts:

- What are Kensington Pride, Calypso, R2E2, Honey Gold, Palmer, Keitt and Parvin – they're all varieties of mango grown in Australia.
- Mangoes are related to cashews and pistachios.
- The paisley pattern, developed in India, is based on the shape of a mango.
- Don't judge a mango by its colour – red does not mean ripe. Squeeze gently to judge ripeness. A ripe mango will "give" slightly and a firm mango will ripen at room temperature over a few days.
- The red colour does indicate the presence of red pigment anthocyanins.
- To speed up ripening, place mangoes in a paper bag at room temperature. Once ripe, mangoes can be put in the fridge to slow down ripening.
- Mangoes can be enjoyed with salt, lime juice or chili powder for a unique flavour experience.
- Mangoes are: perfectly paired as salsas and chutneys with chicken, fish or prawns; in summer salads; grilled on the BBQ; in smoothies and atop pavlovas.
- Mango Madness is the term to describe the tropical seasonal affective disorder, linked to stress and depression, that affects Australians in the north during the high heat weather prior to the tropical wet season.^{2,3}
- Keep your skin healthy and attractive with mango. Packed with beta-carotene to help your skin glow from within.⁴⁻⁶

NUTRITION INFORMATION

Serving size: 150g (1/2 mango raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	126g		84g
Energy	356kJ	4%	237kJ
Protein	0.6g	1%	0.4g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	20.1g	6%	13.4g
Sugars	19.4g	22%	12.9g
Dietary fibre	2g	7%	1.3g
Sodium	0mg	0%	0mg
Potassium	230mg		153mg
Folate eq	48ug	24%	32ug
Vitamin C	36mg	90%	24mg
Vitamin E^	1.3mg	13%	0.85mg
Total polyphenols^	152mg GAE		101mg GAE
Beta-carotene eq	1230ug		820ug
Lutein zeaxanthin^	35ug		23ug
Glycemic Index (GI) ^^	51		

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

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 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>
 ^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SUBSTANTIATION FOR MANGO

Individual consumer friendly nutrient content and permitted general level health claims:

- Calm the mango madness with vitamin C-rich mangoes – the tropical good mood food. A sweet mango cheek contain 90% of the RDI for vitamin C – a vital nutrient for psychological wellbeing and better brain function.
- Go you good thing – mango contains folate to fight fatigue and keep on going. Half a mango provides 24% of the RDI for folate needed for reducing tiredness and fatigue.
- Gett'in cheeky w it! Mangoes contain vitamin E for antioxidant defence and to fight free radicals. A serve of mango (150g) provides 13% of the RDI.
- Mangoes contain a variety of polyphenol antioxidants (152mg/serve) to protect cells from oxidative stress.
- Mango's glorious yellow-orange colour is thanks to colourful carotenoid pigments - beta-carotene (orange) and lutein zeaxanthin (yellow). Natural antioxidants to fight free radicals.
- Eat half a mango and add 2g of fibre to your daily fibre target for a healthy gut function.
- A sweet cheek - mangoes are fuelled with natural fruit sugars – energy to get up and go.
- Mango is low so you can go- mangoes contain low GI carbs (GI=51) for longer lasting energy to keep you going and going.
- Half a mango contains 230mg potassium for a healthy functioning nervous system.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

NUTRITION INFORMATION

Serving size: 150g (1/2 mango raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	126g		84g
Energy	356kJ	4%	237kJ
Protein	0.6g	1%	0.4g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	20.1g	6%	13.4g
Sugars	19.4g	22%	12.9g
Dietary fibre	2g	7%	1.3g
Sodium	0mg	0%	0mg
Potassium	230mg		153mg
Folate eq	48ug	24%	32ug
Vitamin C	36mg	90%	24mg
Vitamin E^	1.3mg	13%	0.85mg
Total polyphenols^	152mg GAE		101mg GAE
Beta-carotene eq	1230ug		820ug
Lutein zeaxanthin^	35ug		23ug
Glycemic Index (GI) ^^	51		

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as mango is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Is there nothing more perfect than a summer's afternoon on the back deck with the BBQ sizzling, cicadas singing, and the sweet, juicy taste of mango on your lips. Happiness with a capital H right there. Although research suggested there's more to mango that can make you happy.

Mango contains a variety of antioxidant phytochemicals which may affect brain function: gallotannins¹, mangiferin^{1,2,3}, lupeol, and phenolic acids (gallic acid, chlorogenic acid and vanillic acid)². The riper the mango the more these compounds are readily available for absorption since the fibre and starches breakdown to release more nutrients.⁴

Studies have revealed how mangoes have neuroprotective properties due to their antioxidant and anti-inflammatory effects.¹ Mangiferin in particular, is available in mango flesh, leaves and bark and has anti-inflammatory effects. Stressed mice given mangiferin found mangiferin exerts antidepressant-like effects possibly by inhibiting inflammatory markers.^{5,6} Mango also appears to reduce oxidative stress in a rat brain model.⁷

Animal studies testing specific mango extracts have also shown favourable effects on cognitive performance and memory due to improvements in nerve cell density in parts of the brain and reductions in oxidative stress.¹

While human research is lacking in the specific effects of mango on human brain function, studies looking at fruit and vegetables in general are favourable. Eating fruit as a snack such as mango instead of unhealthy snacks such as chocolate or crisps, was found to be associated with lower anxiety and emotional distress.⁸

In both adults and children increased fruit intake may improve psychological wellbeing.⁹ The Australian Victorian Child's Health and Wellbeing study (3,370 children) observed that children with a higher number of daily fruit servings had significantly better odds of emotional control, problem management and relationship building skills (pro-social behaviour).¹⁰ A cross-sectional, prospective Australian study of over 60,000 adults (greater than 45 years in age), found Increasing fruit and vegetable consumption may help reduce psychological distress in middle-aged and older adults.¹¹

Overall a systematic review of 61 studies found a high total intake of fruit and vegetables, may promote higher levels of optimism and self-efficacy, as well as reduce levels of psychological distress.¹² A recent study involving a nationally representative sample of 12,385 Australian adults surveyed over several years reported that combined fruit and vegetable consumption was predictive of increased happiness, life satisfaction and wellbeing, with improvements observed within 2 years.¹³

So mangoes are just the good mood food needed when the summer heat is on.

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 ^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SEARCH TERMS USED FOR PUBMED: Mango/ mango pulp/ mango flesh/ and/or *Mangifera indica* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

37. MUSHROOM A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key messages:

- March on - Mighty mushrooms are rich in niacin that helps fight fatigue and boosts energy levels.
- Be mind fit - Mushrooms are an excellent source of biotin that promotes mental wellness.
- Ready, steady... Mushrooms contain copper needed for a calm brain and steady nerves.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie mushrooms.

Mushroom:

- ✓ Rich in niacin – fights fatigue
- ✓ Rich in biotin – mental wellness
- ✓ Rich in vitamin D (in mushrooms exposed to UV light) OR Source of vitamin D (regular mushrooms) – immune function
- ✓ Source of pantothenic acid – psychological function
- ✓ Source of copper – neurological function
- ✓ Source of folate – beat tiredness

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Mushroom fun facts:

- Although we eat mushrooms as a vegetable, they are actually a type of fungi. Men who eat mushrooms are known to be fun-guys (get it?) 😊
- Mushies make meals tastier because they contain rich 'umami' flavour – a savouriness due to natural glutamates.¹
- Amazingly, if you place mushrooms (gills up) in the sun for around 15 minutes their vitamin D content increases significantly.² So, to boost your vitamin D, save your skin and sun-bake your mushrooms instead!
- Did you know that mushrooms are in the top five vegetables with the highest antioxidant capacity?³

NUTRITION INFORMATION

Serving size: 100g (3 cup-type mushrooms raw)

	Av QTY Per 100g serve	%DI*
Moisture	93g	
Energy	86kJ	1%
Protein	2.3g	5%
Total fat	0.4g	1%
Saturated fat	0.1g	<1%
Total Carbohydrates	1.3g	<1%
Sugars	0g	0%
Sodium	9mg	<1%
Potassium	360mg	
Niacin	3.8mg	38%
Pantothenic acid	1.2mg	24%
Folate	22ug	11%
Biotin	8.5ug	28%
Copper	0.4mg	12%
Total polyphenols^	64mg GAE	
Vitamin D3 eq	2.1ug	21%
Vitamin D3**eq	24.2ug	242%

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

**Mushrooms exposed to UV light

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

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NIP nutrient composition references:

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR MUSHROOM

Individual consumer friendly nutrient content and permitted general level health claims:

- Three cup-type mushrooms (100g) contain more than double (242%) the RDI of vitamin D if the mushrooms have been exposed to UV light. Vitamin D helps the immune system stay strong.
- Three cup-type mushrooms (100g) provide 21% of the RDI of vitamin D. Vitamin D helps the immune system stay strong.
- Three cup-type mushrooms (100g) provides just over a third (38%) of the RDI of niacin. Niacin is needed for brain, nerves and psychological function. Niacin also reduces tiredness by boosting metabolism.
- Three cup-type mushrooms (100g) contains 28% of the RDI of biotin. Biotin is needed for psychological function.
- Three cup-type mushrooms (100g) provide almost a quarter (24%) of the RDI of pantothenic acid. Pantothenic acid is needed for mental performance and reducing fatigue.
- Three cup-type mushrooms (100g) contain 12% of the RDI of copper. Copper is needed for a healthy nervous system and energy production.
- Three cup-type mushrooms (100g) contain 11% of the RDI of folate. Folate is needed for psychological function and reducing tiredness and fatigue.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Mighty mushrooms have been used extensively for their nutritional and medicinal value for thousands of years. They contain a surprising range of nutrients and bioactive compounds that are needed for mental health and wellbeing.

Anti-fatigue effects of mushrooms

Ever felt bone tired? Fatigue is a symptom of tiredness caused by physical and/or psychological stresses. Mushrooms have an anti-fatigue effects and influence several body systems including muscular, cardiovascular, hormonal and immune systems. Several natural compounds in mushrooms

NUTRITION INFORMATION

Serving size: 100g (3 cup-type mushrooms raw)

	Av QTY Per 100g serve	%DI*
Moisture	93g	
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Protein	2.3g	5%
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Pantothenic acid	1.2mg	24%
Folate	22ug	11%
Biotin	8.5ug	28%
Copper	0.4mg	12%
Total polyphenols^	64mg GAE	
Vitamin D3 eq	2.1ug	21%
Vitamin D3**eq	24.2ug	242%

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

**Mushrooms exposed to UV light

"<" means less than

GAE means Gallic Acid Equivalents

help boost the body's response to stress: polysaccharides, peptides, nucleosides, phenolic compounds, and triterpenoids.¹

Hello sunshine! Vitamin D and mood

Mushrooms are a source of vitamin D, and mushrooms exposed to UV light have even greater amounts. UV light helps produce vitamin D in the mushroom just like sunlight does in our skin. Just three cup mushrooms (100g) exposed to UV light can provide over 200% of the Recommended Dietary Intake (RDI) for vitamin D. There is evidence linking vitamin D levels in the body to mood. Higher levels of vitamin D in the blood is associated with a reduced risk of depression.² A study in women with type 2 diabetes found reduced depression and anxiety, and improved mental health in those who took vitamin D supplements for six months.³

Protective compounds in mushrooms

Oxidative stress in the body can lead to metabolic disease, heart disease, Alzheimer's Disease and Parkinson's Disease, premature aging, and some cancers. Consuming a diet rich in antioxidants helps counteracts oxidative stress. Helpfully, mushrooms contain antioxidants: polyphenols, polysaccharides, carotenoids, and minerals such as copper.⁴ Inflammation in the body is linked with depression⁵ and many of the protective compounds in mushrooms: polysaccharides, phenolic and indolic compounds, mycosteroids, fatty acids and carotenoids also have anti-inflammatory effects⁶.

Happy gut

Mushrooms are prebiotics, or foods that stimulate good gut bacteria. They contain unique dietary fibres including: chitin, hemicellulose, β and α -glucans, mannans, xylans, and galactans.⁷ Diets low in fibre can disturb the balance of bacteria in the gut and this can result in a dip in psychological wellbeing, poor response to stress and changes in behaviour and mood. Diets rich in fibre can positively affect psychological wellbeing by improving the population of gut bacteria. In other words, when our gut is happy, we feel happier too. Fibres in food can be fermented in the bowel to produce short chain fatty acids (SCFAs) such as butyrate and propionate. These directly reduce brain inflammation and can affect brain structure, function and behaviour and help brain maintenance.⁸

Fruit, vegetables, mushrooms and mood

There is now good evidence that higher fruit and vegetable intake is related to better mental health. People who eat more fruit and vegetables (including mushrooms) experience less mental problems including depression, stress, and negative mood. They are also more likely to have a better mental state such as greater happiness, positive mood, life satisfaction and social and emotional "flourishing" – feelings of meaning, purpose, and fulfilment in life.⁹

Need flourishing? – Eat mushrooms!

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NIP nutrient composition references:

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Mushrooms or *agaricus bisporus* and [mood state/ brain health/ mental health/ antioxidants /gut health/vitamin D and mood]

38. NASHI A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Nashis good for your noggin – with mood boosting folate.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie nashi.

Nashi:

- ✓ Rich in folate – for psychological wellbeing
- ✓ Source of fibre – healthy gut function
- ✓ Contains natural fruit sugars – fuel for the body
- ✓ Contains polyphenols – antioxidant protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Nashi fun facts:

- Often mistaken for a cross between an apple and a pear, Nashis are actually a type of Asian pear.
- 'Nashi' is the Japanese word for 'pear'.
- Nashi skin is a little course, typically speckled, and can be a light yellow, green, golden brown or cream colour, depending on the variety.
- Nashi flesh is almost white, and it tends to be crisp, watery, and sweet.
- Nashi can be eaten raw but also baked, grilled, poached and barbecued, and juiced to make a refreshing drink.
- Due to their high moisture content, nashi pears can bruise quite easily so be gentle with your Nashi.
- Nashi season is February to October.

NUTRITION INFORMATION

Serving size: 150g (1 small nashi raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	131g		87g
Energy	314kJ	4%	209kJ
Protein	0.6g	1%	0.4g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	16.7g	5%	11.1g
Sugars	15.9g	18%	10.6g
Dietary fibre	3.2g	11%	2.1g
Sodium	11mg	<1%	7mg
Folate eq	66ug	33%	44ug
Total polyphenols^	15.5-219mg GAE		10.3-146mg GAE

Source: Aust Food Comp Data and ^Cho et al variety dependent

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

<http://tenrandomfacts.com/nashi-pear/>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL

<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

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<https://www.tandfonline.com/doi/pdf/10.1080/09168451.2014.973362?needAccess=true>

SUBSTANTIATION FOR NASHI

Individual consumer friendly nutrient content and permitted general level health claims:

- Nashi good for your noggin – with mood boosting folate. A third of your daily folate needs in one small nashi for psychological wellbeing.
- A small nashi contains 3g of fibre for a healthy gut function.
- Looking for a snack to refuel? Try a nashi it contains natural fruit sugars for energy.
- Nashis contain polyphenol antioxidants to fight free radicals – some varieties contain higher levels than others 16-219mg GAE per serve.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit like nashi is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 150g (1 small nashi raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	131g		87g
Energy	314kJ	4%	209kJ
Protein	0.6g	1%	0.4g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	16.7g	5%	11.1g
Sugars	15.9g	18%	10.6g
Dietary fibre	3.2g	11%	2.1g
Sodium	11mg	<1%	7mg
Folate eq	66ug	33%	44ug
Total polyphenols^	15.5-219mg GAE		10.3-146mg GAE

Source: Aust Food Comp Data and ^Cho et al variety dependent

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Crisp sweet nashi are a beloved fruit in many Asian countries. They are also known as the Asian pear or Oriental pear because they are native to northern Asia. Nashi is actually the Japanese word for "pear". Like all pears they are a source of phytochemicals, especially antioxidants.

The dominant antioxidants in mature Nashi include: arbutin and chlorogenic acid with 0.4mg/g FW and 0.226 mg/g FW, respectively. The greatest concentration of arbutin was found in the peel 3-5 times greater than that found in the core and 10-45 times greater than the level in the pulp. Yet the concentration of chlorogenic acid in the core was greater than that in the peel.¹

Others research confirmed nashi pear peels contain more antioxidants than the flesh.² Similarly peeling typical European green pears leads to a 25% drop in total polyphenols.³ So regardless if eating pears or Nashis don't eat a bare pear!

The total polyphenol content of Nashi can vary depending on variety 10.3–146.0 mg GAE/100 g fresh weight⁴ and they have free radical scavenging capabilities which has been shown to reduce blood oxidation in a rat model⁵.

Researchers have found a good correlation between the total polyphenol content of European pears and the radical-trapping antioxidant potential. While there is no direct evidence of the benefit of pears on brain function, increasing apple and pear consumption has been linked with a reduced risk of stroke. Flavonoid-rich foods associated with a significant reduction in cardiovascular disease includes pears.³

However there is good evidence of fruit intake in general and positive effects on brain function and mood. Eating fruit as a snack compared to an unhealthy snack such as chocolate or crisps, was found to be associated with lower anxiety and emotional distress.⁶ In both adults and children increased fruit intake may improve psychological wellbeing.⁷ The Australian Victorian Child's Health and Wellbeing study (3,370 children) observed that children with a higher number of daily fruit servings had significantly better odds of emotional control, problem management and relationship building skills (pro-social behaviour).⁸

A systematic review of 61 studies considered a number of mood characteristics ranging from general and mental wellbeing, quality of life, sleep quality, life satisfaction, flourishing, mood, self-efficacy, curiosity, creativity, optimism, self-esteem, stress, nervousness, or happiness, to anxiety and distress. The results indicated that high total intake of fruit and vegetables may promote higher levels of optimism and self-efficacy, as well as reduce levels of psychological distress.⁹

Enjoy nashis as a snack, on the BBQ, in a drink, baked as a dessert - so many options to gain the mood boosting effects of nashi.

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SEARCH TERMS USED FOR PUBMED: Nashi and/or *Pyrus pyrifolia* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

39. NECTARINE A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Give your mood a shiny sheen with vitamin C in nectarine.
- Get psyched. Nectarines contain niacin for positive mood.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie nectarines.

Nectarine:

- ✓ Rich in vitamin C – the feel good nutrient
- ✓ Source of niacin – positive mood
- ✓ Source of vitamin E – antioxidant protection
- ✓ Contains polyphenols – antioxidant protection
- ✓ Contains potassium – nerve function
- ✓ Contains natural fruit sugars – natural energy
- ✓ Low Glycemic Index carbs – sustained energy
- ✓ Source of fibre – gut health
- ✓ Contains fluids – contributes to hydration

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Nectarine fun facts:

- Nectarines can be clingstone (fruit flesh sticks to the stone) or freestone (fruit flesh comes away easily from the stone).
- Nectarean is an old English word used in a 17th century poem meaning “sweet as nectar”.¹
- Sliced nectarines are perfect as a topping on pancakes or waffles or simply grilled on the barbie. Nectarines also pair beautifully with almonds, honey and soft cheeses (goat cheese or ricotta). A few minutes on a grill turns halved nectarines into a caramelised delicacy.
- If you're in the mood for something savoury, try chopped nectarines in salsa to top tacos, hamburgers or grilled fish. Or slice them to dress up a chicken sandwich.
- Nectarines are at their best when they yield slightly to the touch, have taut skin and are fragrant. To ripen nectarines leave them on the kitchen counter for a couple of days before eating. After that, store them in the fridge.

NUTRITION INFORMATION

Serving size: 150g (1 nectarine unpeeled raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	131g		87g
Energy	272kJ	3%	181kJ
Protein	1.8g	4%	1.2g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	12g	4%	8g
Sugars	12g	13%	8g
Dietary fibre	3g	10%	2g
Sodium	0mg	0%	0mg
Potassium	356mg		237mg
Niacin eq	2.3mg	23%	1.5mg
Vitamin C	18mg	45%	12mg
Vitamin E	1.2mg	12%	0.8g
Total polyphenols^	144mg GAE		96mg GAE
Beta-carotene eq	99ug		66ug
Glycemic Index (GI)^	43 (low)		

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

References for website:

- 1) <https://www.nature.com/articles/1601898.pdf>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL

<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SUBSTANTIATION FOR NECTARINE

Individual consumer friendly nutrient content and permitted general level health claims:

- Nectarines are brimming with nearly half your daily vitamin C requirements and are the perfect pick me up to boost your mood. Vitamin C contributes to psychological function.
- If you want a positive outlook on your life, your best bet is to snack on a nectarine. Just one serve provides 23% of the RDI (Recommended Dietary Intake) for niacin, which supports a positive mood and psychological wellbeing.
- Vitamin E is a powerful antioxidant that protects body cells from free radical damage. Eating one nectarine will give you 12% of your daily vitamin E requirements.
- Nectarines provide 144mg of polyphenol antioxidants in a serve, to help protect your body cells from free radical damage.
- One nectarine provides 356mg of potassium for a proper functioning nervous system.
- Feeling in an energy slump? Bite into a juicy nectarine for natural fruit sugars to keep you energised. One serve contains 12g of fruit sugars.
- A nectarine is your ideal summerfruit companion, with its low Glycemic Index of 43, it will give sustained energy.
- The colourful skins and fleshy fruit of nectarines are a source of fibre to support good digestive health and feed your gut bacteria. Snack on a nectarine mid-morning to get 10% of your daily fibre needs.
- Summer means heat and sweat. Snack on a nectarine which is 87% moisture and it will contribute to your body fluids and help to keep you hydrated.

NUTRITION INFORMATION

Serving size: 150g (1 nectarine unpeeled raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	131g		87g
Energy	272kJ	3%	181kJ
Protein	1.8g	4%	1.2g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	12g	4%	8g
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Niacin eq	2.3mg	23%	1.5mg
Vitamin C	18mg	45%	12mg
Vitamin E	1.2mg	12%	0.8g
Total polyphenols^	144mg GAE		96mg GAE
Beta-carotene eq	99ug		66ug
Glycemic Index (GI)^	43 (low)		

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as nectarines is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Hands up if you can't wait for summer and the summerfruit season? Biting into a ripe nectarine in the middle of summer is one of life's greatest delicacies and a sure way to feel happy. The research supports this too. There is good evidence that a high fruit and vegetable intake means you are more likely to be happy and fulfilled in life.¹ So enjoy eating nectarines and feel the satisfaction!

Nectarines contain a number of antioxidants including vitamin E, beta-carotene and polyphenols, which may play a role in maintaining brain health.² The antioxidant content of nectarines is linked to its antioxidant capacity.^{3,4}

Nectarines are also super juicy, containing 87% moisture that can contribute to your total body fluids, helping you to keep hydrated in the heat of summer. Getting enough fluids is important for brain function, emotional wellbeing and mood. Studies in adults' show just a small loss of body fluids (around 1%) is enough to increase negative emotions such as anger, confusion, tension, anxiety and depression, while consuming fluids can improve cognitive function and mood.⁵

In general eating more fruit such as nectarines is beneficial for a positive outlook. A systematic review of 61 studies considered a number of mood characteristics ranging from general and mental wellbeing, quality of life, sleep quality, life satisfaction, flourishing, mood, self-efficacy, curiosity, creativity, optimism, self-esteem, stress, nervousness, or happiness, to anxiety and distress. The results indicated that high total intake of fruit and vegetables may promote higher levels of optimism and self-efficacy, as well as reduce levels of psychological distress.⁶

Eating fruit as a snack (such as a nectarine after lunch) has been linked with lower anxiety and emotional distress compared to an unhealthy snack such as chocolate or crisps.⁷

In both adults and children increased fruit intake may improve psychological wellbeing.⁸ The Australian Victorian Child's Health and Wellbeing study (3,370 children) observed that children with a higher number of daily fruit servings had significantly better odds of emotional control, problem management and relationship building skills (pro-social behaviour).⁹

So many reasons to relish summerfruit like nectarines.

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^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SEARCH TERMS USED FOR PUBMED: Nectarine or *Prunus persica* and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition]

40. OLIVE A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Let the healthy fats in olives look after your brain's blood supply so you can 'go with the flow'.
- Olive your best life! De-stress your brain with antioxidant vitamin E.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie olives.

Olive:

- ✓ Source of vitamin E – antioxidant protection
- ✓ Contains polyphenols – fight free radicals
- ✓ Contains healthy fats - safeguard circulation

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Olive fun facts:

- Olives are actually a fruit, even though they're not sweet.
- The official emblem of the World Health organisation features olive tree branches to symbolise peace and health.¹
- Olives cannot be eaten straight from the tree. They require treatment to remove bitterness, and fermentation to develop their flavour – this involves using salt.²
- Table olives are different to oil producing varieties: they are larger in size, have more flesh on a smaller seed and lower oil content.³
- The consumption of table olives jumped by 182% in the 26 years between 1990 and 2016, probably due to the popularity of the Mediterranean diet.²
- Did you know all olives turn black/purple when ripe? Green olives are picked before ripening.⁴

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

~Perpetuini G, Caruso G, Urbani S, et al. Changes in Polyphenolic Concentrations of Table Olives (cv. Itrana) Produced Under Different Irrigation Regimes During Spontaneous or Inoculated Fermentation. 2020;11:71]. *Front Microbiol.* 2018;9:1287. doi:10.3389/fmicb.2018.01287 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6013719/>

NUTRITION INFORMATION

Serving size: 40g

(10 olives, black or green drained)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	28g		70g
Energy	342kJ	4%	856kJ
Protein	0.8g	2%	2g
Total fat	8.2g	12%	20.5g
Saturated fat	1g	4%	2.6g
Polyunsaturated fats	0.8g		2.1g
Monounsaturated fats	6g		14.9g
Total Carbohydrates	0.7g	<1%	1.8g
Sugars	0g	0%	0g
Sodium	580mg	25%	1450mg
Vitamin E	2mg	20%	5mg
Total polyphenols~	384mg		960mg
Beta-carotene eq	112ug		280ug
Lutein & zeaxanthin^	204ug		510ug

Source: Aust Food Comp Data or ^ USDA

~ Av. figures from: Perpetuini et.al. 2020

*based on an average adult diet of 8700 kJ

"<" means less than

SUBSTANTIATION FOR OLIVE

Individual consumer friendly nutrient content and permitted general level health claims:

- Ten olives contain 20% of the daily recommended amount of vitamin E to protect against oxidative stress and maintain the cells in your brain and nervous system.
- Olives contain 384mg of antioxidant polyphenols that fight free radicals.
- Healthy fats make up 80% of the fats in olives. Necessary for a healthy heart plus they help the body absorption fat soluble nutrients such as vitamin E and beta-carotene.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, such as olives, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 40g

(10 olives, black or green drained)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	28g		70g
Energy	342kJ	4%	856kJ
Protein	0.8g	2%	2g
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Polyunsaturated fats	0.8g		2.1g
Monounsaturated fats	6g		14.9g
Total Carbohydrates	0.7g	<1%	1.8g
Sugars	0g	0%	0g
Sodium	580mg	25%	1450mg
Vitamin E	2mg	20%	5mg
Total polyphenols~	384mg		960mg
Beta-carotene eq	112ug		280ug
Lutein & zeaxanthin^	204ug		510ug

Source: Aust Food Comp Data or ^ USDA

~ Av. figures from: Perpetuini et.al. 2020

*based on an average adult diet of 8700 kJ

"<" means less than

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

When people gather to connect, talk, eat and drink, you'll often find olives; they're a great socialiser. Here are some fascinating facts you might not know about why olives are so important for health and happiness.

Interesting compounds in olives

Polyphenols

Olives contain a range of antioxidant polyphenols including flavonols and secoiridoids (such as oleuropein)¹ Phenolic compounds are potent antioxidants that also show anti-inflammatory effects and may protect against the development of cardiovascular disease and degenerative brain diseases such as Alzheimer's Disease.² Polyphenol content can vary between 1-3% in fresh olives.³

Fresh olives right from the tree have a bitter taste that make them unpleasant to eat. This is due to the oleuropein and ligstroside.⁴ During ripening and processing the level of bitter oleuropein decreases because it is converted into non-bitter hydroxytyrosol and tyrosol so they taste better. Hydroxytyrosol is a potent antioxidant, and oleuropein has been shown to reduce blood clotting and

cholesterol oxidation which are both involved in the development of cardiovascular disease. Olive oil polyphenols also show promise in the prevention and treatment of brain degenerative diseases.⁵

Pigments

Olives contain chlorophylls - responsible for their bright green colour, carotenoids - beta-carotene and lutein/zeaxanthin - but it's when phenolic compounds are oxidised that olives turn purple/black in colour. These compounds have antioxidant effects.¹

Vitamin E

The vitamin E in olives has potent antioxidant and anti-inflammatory activities which influence immune function and cell signalling important for healthy brain function. Interestingly people with Alzheimer's Disease have low levels of vitamin E in their blood so eating more dietary sources may reduce the progression of the disease.⁶

A study giving adults green table olives for 30 days found improvements in a marker of oxidative stress and inflammation, demonstrating that antioxidant and anti-inflammatory compounds present in olives are available and effective after consumption.⁷

Olives are fermented foods

Most olives are fermented and the bacteria such as lactic acid bacteria and yeasts produce organic acids. These lactic acid bacteria and their by-products have beneficial effects in the gut and are now recognised as probiotic agents.⁸

The scientific evidence to date support the role of the gut microbiome (the trillions of microbial organisms living in the human gut) in regulating brain function. The consumption of a diet high in fibres, polyphenols, and healthy unsaturated fats (such as those in olives and olive oil) can promote microbes that produce anti-inflammatory compounds.⁹

Consuming probiotics, especially from fermented foods, improves gut permeability and barrier function with direct effects on metabolic and cardiovascular health. Interestingly they also have indirect effects on depression, anger, anxiety, and levels of stress hormones. Optimising the microbiome and controlling inflammation may improve mood.¹⁰

The Mediterranean diet

Table olives and olive oil are an important part of the traditional Mediterranean diet common to all Mediterranean countries.⁷ A Mediterranean diet is characterised by high vegetable, fruit and nut intake. A review of studies examining healthy diet and the risk of depressive outcomes concluded following a healthy diet, in particular a traditional Mediterranean diet, or avoiding a pro-inflammatory diet appears to protect against depression. The most compelling evidence was found for the Mediterranean diet and depression, with the highest adherence to the diet conveying a 33% lower risk of depression.¹¹

The Mediterranean diet is well known for its ability to reduce the risk of cardiovascular disease. In one analysis, olives were identified as one of the foods with the greatest evidence of preventing atherosclerosis (hardening of the arteries), along with tomatoes, garlic, berries, apples, cocoa and grapes.¹¹ Cardiovascular diseases can include stroke.

There is now good evidence that higher fruit and vegetable intake in general is related to better mental health. Research has established that people who eat more fruit and vegetables have a lower incidence of mental disorders, including lower rates of depression, perceived stress, and negative mood. And they also have a higher likelihood of optimal mental states, such as greater happiness,

positive mood, life satisfaction and social and emotional “flourishing” - feelings of meaning, purpose, and fulfilment in life.¹³

References for substantiation

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

~Perpetuini G, Caruso G, Urbani S, et al. Changes in Polyphenolic Concentrations of Table Olives (cv. Itrana) Produced Under Different Irrigation Regimes During Spontaneous or Inoculated Fermentation. 2020;11:71]. *Front Microbiol.* 2018;9:1287. doi:10.3389/fmicb.2018.01287 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6013719/>

SEARCH TERMS USED FOR PUBMED: Olive or *olea europaea* and review and diet and [mood/psychological wellbeing/ optimism/ brain function/ cognition/gut health]

41. (EXTRA VIRGIN) OLIVE OIL A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Don't grizzle, drizzle! Nourish your mind with extra virgin olive oil's good fats.
- Live the Mediterranean diet dream with extra virgin olive oil and its antioxidant vitamin E.
- The polyphenols in extra virgin olive oil provides antioxidant protection for peace of mind.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian Extra Virgin Olive Oil.

Extra Virgin Olive Oil:

- ✓ Rich in vitamin E – antioxidant protection
- ✓ Contains healthy fats – safeguard circulation
- ✓ Contains polyphenols – fight free radicals

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Olive oil fun facts:

- Olive trees are one of the oldest known cultivated plants and date back 6000 years to the early Bronze age.¹
- 'Extra virgin' means the oil from the first cold pressing of the fruit and is the highest grade.
- Olive varieties can be grouped into those best for eating (table olives), best for making olive oil or dual-purpose varieties that are good at both.²
- Did you know that dressing your vegetables and salads with olive oil helps your body better absorb their phytonutrients? ³ The bonus is they taste better too so you'll eat more of them.
- You can tell if olive oil is fresh by taking a sip and if there is a burn in the throat after you swallow this indicates high antioxidant content.
- Bust the myth – yes you can cook with extra virgin olive oil – the antioxidant content protects the oil when heated.
- Historically olive oil is considered an aphrodisiac in the Mediterranean region? In Ancient Greece newlyweds were given bread dipped in olive oil to encourage conception.⁴

NUTRITION INFORMATION

Serving size: 15ml (3 tsp)

	Av QTY Per serve	%DI *	Av QTY per 100ml
Energy	595kJ	7%	3400kJ
Protein	0g	0%	0g
Total fat	16.1g	23%	91.9g
Saturated fat	2.1g	10%	14.3g
Polyunsaturated fat	1.3g		8.4g
Monounsaturated fat	10g		64.5g
Total Carbohydrates	0g	0%	0g
Sugars	0g	0%	0g
Sodium	0mg	0%	0mg
Vitamin E	3.5mg	35%	20mg
Total polyphenols#	6-40mg		38-100mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

Australian commercial data (Cobram Estate) and Gorzynik-Debicka et al 2018

"<" = less than

References for website:

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NIP nutrient composition database references

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

Australian commercial data from Cobram Estate Extra Virgin Olive oil- patient education and product labels <https://health.cobramestate.com.au/wp-content/uploads/2018/02/Patient-Brochure.pdf>

Virgin olive oil contains about 500mg/L polyphenols. Source: Gorzynik-Debicka M, Przychodzen P, Cappello F, et al. Potential Health Benefits of Olive Oil and Plant Polyphenols. *Int J Mol Sci.* 2018;19(3):686. doi:10.3390/ijms19030686 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5877547/>

SUBSTANTIATION FOR EXTRA VIRGIN OLIVE OIL

Individual consumer friendly nutrient content and permitted general level health claims:

- 3 teaspoons (15ml) of extra virgin olive oil contains almost one third of the daily recommended amount of vitamin E to protect and maintain the cells in your brain and nervous system against oxidative stress.
- The healthy fats make up 79% of the fat in extra virgin olive oil. These healthy monounsaturated fats are heart healthy.
- Extra virgin olive oil contains antioxidant polyphenols that fight free radicals.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied Mediterranean diet rich in fruit, vegetables, nuts and extra virgin olive oil is good for mental health, psychological wellbeing and mood.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 15ml (3 tsp)

	Av QTY Per serve	%DI *	Av QTY per 100ml
Energy	595kJ	7%	3400kJ
Protein	0g	0%	0g
Total fat	16.1g	23%	91.9g
Saturated fat	2.1g	10%	14.3g
Polyunsaturated fat	1.3g		8.4g
Monounsaturated fat	10g		64.5g
Total Carbohydrates	0g	0%	0g
Sugars	0g	0%	0g
Sodium	0mg	0%	0mg
Vitamin E	3.5mg	35%	20mg
Total polyphenols#	6-40mg		38-100mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

Australian commercial data (Cobram Estate) and Gorzynik-Debicka et al 2018

"<" = less than

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Extra virgin olive oil (EVOO) and the Mediterranean diet goes hand in hand. The Mediterranean diet is considered one of the world's healthiest dietary patterns, especially when it comes to metabolic health and longevity. Here we find out how EVOO also helps promote mental as well as physical wellbeing. Enjoying EVOO along with a diet rich in fruit, vegetable, nuts and mushrooms may well be the ticket to the Mediterranean diet dream.

Interesting compounds in extra virgin olive oil

Virgin olive oil is obtained from direct pressing of the fruit without heat or chemicals. Extra virgin olive oil (EVOO) is the highest grade and is distinguished from virgin olive oil due to lower acidity and better taste profile.¹ The health benefits of olive oil apply mostly to EVOO, so this summary will focus on it.

Extra virgin olive oil contains the highest levels of polyphenols (500mg/kg) and unfiltered EVOO preserves even more polyphenols making it an excellent choice for health. Refined olive oil produced through chemical solvent extraction contains very low levels of polyphenols. The major polyphenols in virgin olive oil give it complex flavour including bitter notes. They consist of phenolic acids or alcohols (hydroxytyrosol- a potent antioxidant), oleuropein, lignans and flavonoids. Olive oil also contain phytosterols, squalene and terpenic acid. Don't worry if you can't pronounce or even remember these- just know they're good! Oleuropein has been shown to reduce blood clotting and cholesterol oxidation which are both involved in the development of cardiovascular disease. Olive oil polyphenols also show anti-inflammatory effects in the brain² and show promise in the prevention and treatment of degenerative brain diseases.³

In a study where people were asked to follow a Mediterranean diet enriched with olive oil for three months, they experienced reductions in oxidative stress and inflammation as well as increases in beneficial lactic acid bacteria in the gut microbiota.⁴ EVOO benefits extend throughout the body.

Olive oil and mood

Olive oil has been associated with a lower risk of depression and may even improve symptoms of depression.⁵ A study of over 9000 people in the USA found consumption of olive oil, and a Mediterranean dietary pattern overall, was associated with a more positive mood and emotions; they felt more inspired, alert, excited, enthusiastic, and determined.⁶

Olive oil and vascular health

The cardiovascular benefits of olive oil are well known. Olive oil consists mostly of monounsaturated fatty acids, with oleic acid being the major one. These are of benefit to cardiovascular health as a replacement for harmful saturated fats. However the benefits of EVOO are likely due to a combination of both healthy fats and phenolic compounds.⁷

Are there things in common between heart health and mental wellbeing? Yes, there are. Current evidence supports a link between cardiovascular disease and brain conditions such as stroke, dementia and cognitive impairment. Several large population studies have demonstrated that cardiovascular risk factors, aside for contributing substantially to the risk of stroke, negatively influence overall brain health.⁸ There are also links between coronary heart disease and mental illness and they may share common causes.⁹

Olive oil, gut health and mood

The compounds in olive oil are associated with higher diversity and better balance of gut bacteria.¹⁰ The scientific evidence to date support the role of the gut microbiome (the trillions of microbial organisms living in the human gut) in regulating brain function. The consumption of a diet high in fibres, polyphenols, and healthy unsaturated fats (such as those in olives and olive oil) can promote microbes that produce anti-inflammatory compounds.¹¹ Optimising the microbiome and controlling inflammation may improve mood.¹²

Olive oil and the Mediterranean diet

A Mediterranean diet is characterised by high vegetable, fruit and nut intake and extra virgin olive oil as the main source fat. A review of studies examining healthy diet and the risk of depressive outcomes concluded following a healthy diet, in particular a traditional Mediterranean diet appears to protect against depression. The most compelling evidence was found for the Mediterranean diet and depression, with those sticking to the diet the most had a 33% lower risk of depression.¹³

Experts in the emerging field of nutritional psychiatry have developed dietary recommendations for the prevention of depression, based on the best available current evidence. These recommendations include following 'traditional' dietary patterns, such as the Mediterranean diet.¹⁴

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NIP nutrient composition database references

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Australian commercial data from Cobram Estate Extra Virgin Olive oil- patient education and product labels <https://health.cobramestate.com.au/wp-content/uploads/2018/02/Patient-Brochure.pdf>

Virgin olive oil contains about 500mg/L polyphenols. Source: Gorzynik-Debicka M, Przychodzen P, Cappello F, et al. Potential Health Benefits of Olive Oil and Plant Polyphenols. *Int J Mol Sci.* 2018;19(3):686. doi:10.3390/ijms19030686 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5877547/>

SEARCH TERMS USED FOR PUBMED: Extra virgin/Olive oil and review and diet and [mood/psychological wellbeing/ optimism/ brain function/ cognition/polyphenols/CVD]

42. ONION A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Put a smile on your dial with onions. Energy-boosting vitamin C, helps to combat fatigue.
- When life runs rings – eat onions. They contain folate to keep your brain at its best.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie onions.

Onion:

- ✓ Source of folate – boost mood
- ✓ Source of vitamin C – uplifting energy
- ✓ Source of fibre – good for the gut
- ✓ Contains fructans – a prebiotic fibre
- ✓ Contains polyphenols - natural antioxidants
- ✓ Contains quercetin – antioxidant capacity
- ✓ Red onion contains anthocyanin – red purple pigment antioxidant

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Onion fun facts:

- Onions contain gut-loving fructans. Fructans are prebiotic fibres that are resistant to digestion. They feed the gut microbiome and promote the growth of healthy bacteria.^{1,2,3}
- Don't over peel your onions - the outer layers contain more antioxidant quercetin.⁴
- To prevent tears, avoid cutting the onion root. The chemicals that cause tears are highly concentrated near the root.⁵ Or wear onion goggles instead!
- Preserve onion nutrition by using quick cooking methods such as stir fry, microwave and steam. Enjoy some raw and try ferment onions with other vegetables too.
- Onions are best stored in a cool, dark area away from potatoes or they'll spoil more quickly.

NUTRITION INFORMATION

Serving size: 75g (half an onion raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	67g		89g
Energy	104kJ	1%	139kJ
Protein	1.0g	2%	1.3g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	4.4g	1%	5.8g
Sugars	4.4g	5%	5.8g
Dietary fibre	2.0g	7%	2.7g
Sodium	6mg	<1%	8mg
Folate eq	26.3ug	13%	35ug
Vitamin C	5.3mg	13%	7mg
Total polyphenols^	113mg GAE		150mg GAE
Anthocyanins^^ (red onion only)	36mg		48mg
Quercetin**	29mg		39mg
Fructans^^^	1.6mg		2.1mg

Source: Aust Food Comp Data or ^ USDA data

^^Average of three sources

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

- 1) Muir JG et al. Fructan and free fructose content of common Australian vegetables and fruit. *J Agric Food Chem*. 2007 Aug 8;55(16):6619-27. <https://pubmed.ncbi.nlm.nih.gov/17625872/>
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<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem.* 2006;54(11):4069-4075. doi:10.1021/jf060300I <https://pubmed.ncbi.nlm.nih.gov/16719536/>

**USDA National Nutrient Database for Flavonoids

https://www.ars.usda.gov/ARSUserFiles/80400525/Data/Flav/Flav_R03-1.pdf

**Phenyl Explorer database <http://phenol-explorer.eu/contents/food/466>

^^^Muir JG, Shepherd SJ, Rosella O, et al. Fructan and free fructose content of common Australian vegetables and fruit. *J Agric Food Chem.* 2007;55(16):6619-6627. doi:10.1021/jf070623x

https://www.academia.edu/1599675/Fructan_and_free_fructose_content_of_common_Australian_vegetables_and_fruit

SUBSTANTIATION FOR ONION

Individual consumer friendly nutrient content and permitted general level health claims:

- Onions are fatigue-fighters. Half an onion can boost vitality by providing 13% of the RDI for Vitamin C; an essential nutrient to help reduce tiredness.
- Slice half an onion and add to your meals to boost your mood. This will give you 13% RDI for folate, an essential nutrient for psychological wellbeing.
- Onions are a source of fibre with half an onion contributing 2g to an adult's daily fibre needs of 30g. Fibre is necessary for gut health.
- Onions contain a prebiotic fibre called fructans which feed a healthy gut microbiome. A serve contains 2mg fructans.
- Onions unique flavour and aroma comes from a number of natural chemicals including polyphenols which also offer antioxidant protection.
- The outer layers of an onion contain more quercetin (a yellow pigment) than the inner layers. Quercetin (29mg in ½ an onion) helps boost the body's antioxidant capacity. So don't over peel your onions.
- The pretty purple colour of a red onion is due to the pigment anthocyanins. Anthocyanins are another type of antioxidant. Half an onion gives 36mg of anthocyanins.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

NUTRITION INFORMATION

Serving size: 75g (half an onion raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	67g		89g
Energy	104kJ	1%	139kJ
Protein	1.0g	2%	1.3g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	4.4g	1%	5.8g
Sugars	4.4g	5%	5.8g
Dietary fibre	2.0g	7%	2.7g
Sodium	6mg	<1%	8mg
Folate eq	26.3ug	13%	35ug
Vitamin C	5.3mg	13%	7mg
Total polyphenols^	113mg GAE		150mg GAE
Anthocyanins^^ (red onion only)	36mg		48mg
Quercetin**	29mg		39mg
Fructans^^^	1.6mg		2.1mg

Source: Aust Food Comp Data or ^ USDA data

^^Average of three sources

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as onions as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of vegetables such as onions can boost your mood, improve brain function, as well as overall wellbeing and happiness.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and so not suitable for branded communications. Instead this information is for educational purposes only.

A review of the last ten years, has revealed no individual studies looking specifically at onions (*Allium cepa*) and mood, mental health, wellbeing or cognition. Whilst there is some research on polyphenol antioxidants found in onions (e.g. quercetin), the studies do not investigate mood outcomes.

Instead a large review of 61 different studies found a high intake of vegetables, as well as fruit, in adults promotes higher levels of optimism and self-efficacy – confidence that you can achieve what you set out to achieve. These fruit and veg eaters also had less psychological distress and the research clearly shows that fruit and vegetables have a positive influence on mental health. Include onions in your every-day meals to help meet the daily recommendation of 5 serves of vegetables.¹

A study in young adults found higher fruit and vegetable intake led to greater engagement, curiosity, creativity and purpose in life. On days the participants ate more fruit and vegetables they reported greater wellbeing, curiosity and creativity compared to days they ate less.² Onions are such a versatile vegetable to include in so many meals, so get chopping and dicing to reach this higher life purpose.

An Australian study assessing the food diaries of 12,385 Australian adults found if you ate higher intakes of fruit and vegetable you were more likely to be happier and have more life satisfaction and wellbeing. Just looking at those eating the highest amount of fruit and vegetables (8 portions a day) over a two year period - their increase in life satisfaction was equal to the mood boost you would get if moving from unemployment to employment.³

Onions are a source of prebiotic fibre called fructans, a type of fibre that helps to feed the good bugs in our gut. Fibre in food can be fermented in the bowel to produce short chain fatty acids such as butyrate and propionate. These directly reduce brain inflammation and can affect brain structure, function and behaviour and help brain maintenance.⁴

Onions contains a number of natural chemicals which help give onion its distinctive flavour and aroma. Some of these have antioxidant benefits such as quercetin and anthocyanins. Quercetin may help protect against cognition impairment during aging and improve memory by counteracting oxidative damage, stress and inflammation.^{5,6} Anthocyanins may have similar protective effects on cognitive performance and memory.^{7,8}

Does eating onions work in real life to boost mood? A staff canteen promotion says yes. A worksite health promotion initiative that encouraged employees to eat a healthy vegetable-based diet resulted in significant improvements in their sleep quality, quality of life, and depressive symptoms. The initiative used the acronym 'G-BOMBS +T' to remind employees what to eat each day. The letters stood for **G**reens - **B**eans, **O**nions, **M**ushrooms, **B**erries, **S**eeds and nuts + **T**omatoes.⁹
Gotta love a good acronym!

So next time you start cooking a recipe don't overlook the importance of the first step – "sauté your onions" – they have many mood-boosting, brain-activating properties.

References for substantiation

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NIP nutrient composition database references

<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem*. 2006;54(11):4069-4075. doi:10.1021/jf060300l <https://pubmed.ncbi.nlm.nih.gov/16719536/>

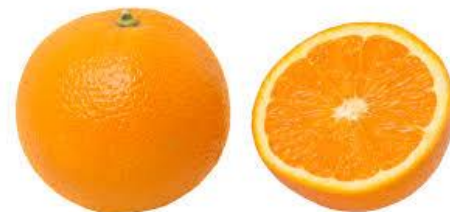
**USDA National Nutrient Database for Flavonoids https://www.ars.usda.gov/ARSUserFiles/80400525/Data/Flav/Flav_R03-1.pdf

**Phenyl Explorer database <http://phenol-explorer.eu/contents/food/466>

^^^Muir JG, Shepherd SJ, Rosella O, et al. Fructan and free fructose content of common Australian vegetables and fruit. *J Agric Food Chem*. 2007;55(16):6619-6627. doi:10.1021/jf070623x https://www.academia.edu/1599675/Fructan_and_free_fructose_content_of_common_Australian_vegetables_and_fruit

SEARCH TERMS USED FOR PUBMED: Onion or *Allium cepa* and review and diet and [mood/cognition/mental health/psychological wellbeing/antioxidants]

43. ORANGE A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Brighten your day with vitamin-C rich oranges - great for psychological wellbeing.
- Get more zest for life with oranges. Orange are folate-rich to help shake off tiredness and fatigue.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie oranges.

Orange:

- ✓ Rich in vitamin C – psychological wellbeing
- ✓ Rich in folate – fights fatigue
- ✓ Source of fibre – happy gut
- ✓ Source of thiamin – brain function
- ✓ Contains potassium – steady nerves
- ✓ Contains polyphenols - antioxidant protection
- ✓ A low glycemic index (GI) of 42 – sustained energy

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Orange fun facts:

- There are over 600 varieties of oranges around the world – how many have you tried?
- Loads of beneficial phytochemicals are found in citrus fruit skin¹ so marmalade with peel may be another superfood!
- Blood oranges are a beautiful crimson colour inside due to the presence of colourful polyphenol pigments called anthocyanins.²
- Oranges have a low glycemic index (GI=42) for longer lasting energy.³
- Oranges are rich in folate which is a vital during pregnancy.

References for website:

- 1 Liew SS, Ho WY, Yeap SK, Sharifudin SAB. Phytochemical composition and in vitro antioxidant activities of *Citrus sinensis* peel extracts. *Peer J*. 2018;6:e5331. doi:10.7717/peerj.5331 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6083463/>
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- 3 http://www.glycemicindex.com/foodSearch.php?ak=list&food_name_search_type=cn&food_name=orange&gi_search_type=lte&gi=&gl_search_type=lte&gl=&lop=AND&find=Find+Records&page=1

NIP nutrient composition references:

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Cebadera-Miranda L, Domínguez L, Dias MI, et al. Sanguinello and Tarocco (Citrus sinensis [L.] Osbeck): Bioactive compounds and colour appearance of blood oranges. *Food Chem*. 2019;270:395-402. doi:10.1016/j.foodchem.2018.07.094. <https://bibliotecadigital.ipb.pt/bitstream/10198/9562/1/31.pdf>

^^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

NUTRITION INFORMATION

Serving size: 150g (1 orange peeled raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	131g		87g
Energy	263kJ	3%	175kJ
Protein	1.5g	3%	1g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	12.3g	4%	8.2g
Sugars	12.3g	14%	8.2g
Dietary fibre	3.6g	12%	2.4g
Sodium	0mg	0%	0mg
Potassium	285mg		190mg
Thiamin	0.15mg	10%	0.07mg
Folate eq	94.5ug	47%	63ug
Vitamin C	78mg	195%	52mg
Total polyphenols^	86mg GAE		57mg GAE
Beta-carotene eq	71ug		47ug
Anthocyanins** (Blood orange)	21mg		14mg
Glycemic Index (GI)^^	42 (av of 6)		

Source: Aust Food Comp Data or ^ USDA data

**Cebadera et al reference 2 (average of 9)

*based on an average adult diet of 8700 kJ

GAE means Gallic Acid Equivalents

SUBSTANTIATION FOR ORANGE

Individual consumer friendly nutrient content and permitted general level health claims:

- Vitamin C is an important nutrient for mind and body, required for psychological wellbeing and the brain and nerves. One orange (150g) provides almost twice (195%) the daily recommended amount of vitamin C.
- One orange provides almost half (47%) of the recommended daily amount of folate, a nutrient that helps shake off tiredness and fatigue.
- Thiamin, or vitamin B1, is important for optimal brain function. One orange provides 10% of the daily requirement of thiamin.
- An orange contains 285mg of potassium for the normal functioning of the nervous system.
- Oranges contain fibre both soluble and insoluble fibre nearly 4g in total. Fibre helps keep the gut happy and going with the flow.
- Oranges contain a range of antioxidants such as polyphenols which save cells from free radical damage.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as oranges, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as oranges is good for mental wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Oranges are beautiful to look at and beautiful to eat, but they're more than just a pretty face.

Interesting compounds in oranges

Oranges are a good source of polyphenols, which in animal studies have shown anti-aging effects including preservation of cognitive function and improvements in intestinal microbiome (the community of bacteria in the gut).¹ The main type of flavanone in oranges is called hesperidin.² Hesperidin from citrus has antioxidant and anti-inflammatory effects and may play a role in the prevention of degenerative brain disorders.³

NUTRITION INFORMATION

Serving size: 150g (1 orange peeled raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	131g		87g
Energy	263kJ	3%	175kJ
Protein	1.5g	3%	1g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	12.3g	4%	8.2g
Sugars	12.3g	14%	8.2g
Dietary fibre	3.6g	12%	2.4g
Sodium	0mg	0%	0mg
Potassium	285mg		190mg
Thiamin	0.15mg	10%	0.07mg
Folate eq	94.5ug	47%	63ug
Vitamin C	78mg	195%	52mg
Total polyphenols^	86mg GAE		57mg GAE
Beta-carotene eq	71ug		47ug
Anthocyanins** (Blood orange)	21mg		14mg
Glycemic Index (GI)**	42 (av of 6)		

Source: Aust Food Comp Data or ^ USDA data

**Cebaderra et al reference 2 (average of 9)

*based on an average adult diet of 8700 kJ

GAE means Gallic Acid Equivalents

Glycemic Indexes (GI) of Oranges

Oranges contain natural sugars for energy but also have a low GI of 42 which means their energy is longer lasting. A lower GI diet is of benefit for overall health, including mental wellbeing. Large population studies have found higher GI diets are associated with symptoms of depression, and the large ups and downs in blood glucose and insulin levels from high glycemic impact foods can cause anxiety and irritability.⁴

Interesting compounds in citrus

Citrus fruit are rich in polyphenols, particularly flavonoids, and these give them their enticing colours, fruity aromas and tart flavours. These flavonoids have antioxidant and anti-inflammatory activity that are thought to protect the nervous system. The flavonoids in citrus fruit are flavanones, flavones, flavonols, flavanols, chalcones and in some cases anthocyanidins in blood oranges.^{5,6} The most common flavones found in citrus fruit and juices are apigenin, diosmetin, luteolin, acacetin, chrysoeriol and these have antioxidant and anti-inflammatory effects.⁵ Diets with low inflammatory potential are associated with better mental health.⁷

Evidence suggests three specific flavonoid sub-groups, the flavanols, anthocyanins and/or flavanones found in citrus have great potential to protect brain and nervous system function and reverse age-related declines in memory and learning.⁸

A review of diets, food and food components found antioxidant polyphenols in citrus may contribute to improvements in inflammation, endothelial (blood vessel) function and oxidative stress after a meal.⁹ Reducing inflammation and oxidative stress can all help reduce age-related and chronic diseases many which can affect brain function.

Fruit and vegetables, mental health, psychological wellbeing and mood

A review of 61 studies analysing the association between fruit and vegetable intake and mental health in adults found a high total intake of fruit and vegetables, and the specific subgroup citrus fruit, may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms. The authors concluded that total fruit and/or vegetable intake, as well as citrus fruit intake in particular, has a positive influence on mental health.¹⁰

A study in young adults found fruit and vegetable intake predicted reduced depressive symptoms and higher positive mood, life satisfaction, and flourishing. The top 10 raw foods related to better mental health included citrus fruit.¹¹

In both adults and children, emerging evidence suggests increased fruit intake improves psychological wellbeing.¹² Fruit including citrus may play a role in maintaining brain health and reducing cognitive decline.¹³

Citrus scents and mood

Asian researchers have found aromatherapy with citrus scents reduces stress. Aromatherapy with citrus scents combined with music therapy was found to reduce stress in Korean nursing students.¹⁴ Similarly a Taiwanese study found citrus scents and music caused relaxation in a group of healthy adults.¹⁵ Whereas the aroma of a Japanese citrus fruit reduced heart rate, and stress and anxiety scores in a group of Japanese women.¹⁶

Japanese researchers¹⁷ also noticed that when a citrus scent was given to 12 depressed people the results indicated that the doses of antidepressants necessary for the treatment of depression could be markedly reduced. The treatment with citrus fragrance normalised neuroendocrine hormone levels and immune function, and appeared more effective than antidepressants.

An Austrian study in dental practice found orange and lavender scents significantly reduced anxiety and improved mood in patients waiting for dental treatment.¹⁸

So many reasons to wake up, smell and eat the oranges!

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FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>
 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Cebadera-Miranda L, Domínguez L, Dias MI, et al. Sanguinello and Tarocco (*Citrus sinensis* [L.] Osbeck): Bioactive compounds and colour appearance of blood oranges. *Food Chem.* 2019;270:395-402. doi:10.1016/j.foodchem.2018.07.094. <https://bibliotecadigital.ipb.pt/bitstream/10198/9562/1/31.pdf>
^^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SEARCH TERMS USED FOR PUBMED: Orange or *citrus sinsensis* and [mood/ diet and mood/ psychological wellbeing/ optimism/ brain function/ cognition/ antioxidants/ hesperidin and inflammation/anthocyanins]

44. ORANGE JUICE A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Feeling the squeeze – drink vitamin C-rich orange juice to refresh and de-stress.
- Refreshingly juicy – folate-rich orange juice refreshes mind and body.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie orange juice.

Orange juice:

- ✓ Rich in vitamin C – psychological wellbeing
- ✓ Rich in folate – mood booster
- ✓ Source of thiamin – energy producer
- ✓ Contains polyphenols – antioxidant defence
- ✓ Contains beta-carotene – antioxidant protection
- ✓ Contain low GI carbs – for sustained energy
- ✓ Contains natural fruit sugars – for energy
- ✓ Contains fluids – for hydration

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Orange juice fun facts:

- 40% of the orange volume in Australia is processed.¹
- Valencia's are deliciously sweet and juicy, and a popular juicing variety.¹
- Australian Dietary Guidelines: a small 125mL glass of orange juice with no added sugar consumed occasionally can count as a serve of fruit.²
- Orange juice contains hesperidin a unique antioxidant polyphenol.³
- There are typically ten segments inside an orange.⁴
- Each individually wrapped segment is called a carpel. Carpels are each made up of smaller, individual juice filled sacs or juice vesicles.⁵
- The word "orange" is unusual – it's doesn't rhyme with anything.⁴ Orange you glad to learn that!

NUTRITION INFORMATION

Serving size: 125ml
(1/2 cup 100% orange juice)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	118g		94g
Energy	146kJ	2%	117kJ
Protein	1.0g	2%	0.8g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	7.1g	2%	5.7g
Sugars	7.1g	8%	5.7g
Sodium	3.8mg	<1%	3.0mg
Thiamin	0.1mg	13%	0.12mg
Folate eq	66.3ug	33%	53ug
Vitamin C	90mg	225%	72mg
Total polyphenols [^]	75mg		60mg
Hesperidin ^{^^}	2.96mg		1.97mg
Beta-carotene eq	19ug		15ug
Glycemic Index (GI) ^{^^}	51		

Source: Aust Food Comp Data or [^] USDA
GI average of 3

*based on an average adult diet of 8700 kJ
"<" means less than

References for website:

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3. Bestwick C, Scobbie L, Milne L, et al. Fruit-Based Beverages Contain a Wide Range of Phytochemicals and Intervention Targets Should Account for the Individual Compounds Present and Their Availability. *Foods*. 2020;9(7):E891. doi:10.3390/foods9070891 <https://www.mdpi.com/2304-8158/9/7/891/pdf>
4. [https://simple.wikipedia.org/wiki/Orange_\(fruit\)#cite_note-2](https://simple.wikipedia.org/wiki/Orange_(fruit)#cite_note-2)
5. https://en.wikipedia.org/wiki/Juice_vesicles

NIP nutrient composition database references

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^ Rangel-Huerta OD, Aguilera CM, Martin MV, et al. Normal or High Polyphenol Concentration in Orange Juice Affects Antioxidant Activity, Blood Pressure, and Body Weight in Obese or Overweight Adults. *J Nutr.* 2015;145(8):1808-1816. doi:10.3945/jn.115.213660 <https://academic.oup.com/jn/article-pdf/145/8/1808/30061054/jn213660.pdf>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

^^^ Bestwick C, Scobbie L, Milne L, et al. Fruit-Based Beverages Contain a Wide Range of Phytochemicals and Intervention Targets Should Account for the Individual Compounds Present and Their Availability. *Foods.* 2020;9(7):E891. doi:10.3390/foods9070891 <https://www.mdpi.com/2304-8158/9/7/891/pdf>

SUBSTANTIATION FOR ORANGE JUICE

Individual consumer friendly nutrient content and permitted general level health claims:

- Feeling the squeeze – drink vitamin C-rich orange juice to refresh and de-stress. Orange you glad that ½ cup contains twice the recommended dietary intake of vitamin C. Vitamin C is needed for a normal psychological function.
- Refreshingly juicy – folate-rich orange juice refreshes mind and body. Half a cup of orange juice contains a third of daily folate needs. Folate is needed for psychological wellbeing.
- Orange juice is a source of thiamin with 125ml containing 13% of the RDI for thiamin. Thiamin is required for energy production.
- Orange juice contains 75mg of total polyphenols for antioxidant defence and specifically hesperidin. Antioxidants protect body cells from free radical damage.
- What puts the orange in orange juice? The orange coloured pigment beta-carotene (19ug/125ml) which is also needed for antioxidant protection.
- Orange juice contain low GI carbs for sustained energy (GI=51).
- Orange juice contains natural fruit sugars a fuel source for the body – 7g sugars in ½ cup juice.
- A ½ cup of orange juice provides nearly 120ml of fluids which contributes to body hydration.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

NUTRITION INFORMATION

Serving size: 125ml

(1/2 cup 100% orange juice)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	118g		94g
Energy	146kJ	2%	117kJ
Protein	1.0g	2%	0.8g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	7.1g	2%	5.7g
Sugars	7.1g	8%	5.7g
Sodium	3.8mg	<1%	3.0mg
Thiamin	0.1mg	13%	0.12mg
Folate eq	66.3ug	33%	53ug
Vitamin C	90mg	225%	72mg
Total polyphenols [^]	75mg		60mg
Hesperidin ^{^^^}	2.96mg		1.97mg
Beta-carotene eq	19ug		15ug
Glycemic Index (GI) ^{^^}	51		

Source: Aust Food Comp Data or [^] USDA

GI average of 3

*based on an average adult diet of 8700 kJ

"<" means less than

Category FRUIT and/or VEGETABLE and/or NUT claim PLUS HYDRATION:

- A healthy, varied diet containing a variety of fruit, vegetables and mushrooms contributes fluids to help hydration, and maintain brain function and mood.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

There's nothing more refreshing than a cool glass of fresh orange juice on a hot summer's day. The sweetness and tartness is due to fruit sugars and 18 different compounds including flavones and limonoids.¹ Flavones are part of the polyphenol antioxidant family and oranges and orange juice are loaded with different antioxidant compounds that boost antioxidant capacity.^{2,3} Oranges/juice has unique polyphenols which are highly bioavailable for absorption by the body - hesperidin and naringenin. Hesperidin and naringenin intakes have been found to reduce the risk of cerebrovascular disease due to antioxidant and anti-inflammatory properties and improve the elastic function of blood vessels.^{4,5} Research has also shown the consumption of juices with these compounds protected against DNA damage and lipid peroxidation while boosting several antioxidant enzymes.⁶

In a first of its kind study - flavonoid rich orange juice has been found to positively affect the gut microbiome of young adults with depressive symptoms. Forty young adults drank 380ml daily of a fresh, pure, flavonoid-rich orange juice or a flavonoid-low orange cordial with the same energy content for 8 weeks. The flavonoid rich juice contain 600mg of flavonoids whereas the low flavonoid drink only had about 108mg flavonoids. In total, 80 faecal samples were tested.

A low level of brain-derived neurotrophic factor (BDNF) is connected to symptoms of depression and this study found flavonoid rich juice improved BDNF levels although not significantly compared to the fruit cordial. Levels of BDNF were also found linked to certain types of gut bacteria. The juice was able to alter the diversity and composition of gut bacteria in those with depression. Depression scores were similar between the two groups although the juice group was more highly significant than the cordial group. Members of the Lachnospiraceae bacterial family, such as the *Roseburia*, *Blautia*, and *Coproccoccus* genus, were boosted and these are known to produce short-chain fatty acids (SCFAs) such as butyrate, and reduce inflammation. SCFAs can influence neurotransmitters and hence brain function, and inflammation is associated with depression. Thus being able to alter the gut microbiome with flavonoids may potentially improve depression in young adults.⁷

A study of 160 women, aged 45-60 years in Poland, found those who drank fruit and vegetable juices more frequently had higher levels of self-efficacy, and those who drank fruit juices more frequently had higher levels of optimism and satisfaction with life compared to those who drank less.⁸

Orange juice can also positively affect brain function and cognition

A review of 22 studies examining fruit, vegetables and 100% fruit/vegetable juice consumption and cognitive function found most studies reported significant benefits. The data suggests that chronic consumption of fruit, vegetables, and juices is beneficial for cognition in healthy older adults. From the limited number of clinical trials for juice it appears consumption of fruit juices can also have immediate benefits for memory function in adults with mild cognitive impairment.⁹

Twenty four men aged 30-65 consumed 240ml of a flavonoid-rich orange juice (272mg of flavonoids) and a calorie-matched placebo in a randomised, double-blind, counterbalanced order on 2 days separated by a 2-week washout. Cognitive function and subjective mood were assessed at baseline (prior to drink consumption) and 2hrs and 6hrs after drinking. Performance on executive function and psychomotor speed tests was significantly better following the juice compared to the placebo. Supported by significant benefits for subjective mood alertness.¹⁰

Another study assessed survey results of 27,842 men (average age of 51 years) captured in 1986, to examine the relationship of vegetable and fruit consumption to future subjective cognitive function (SCF). Average dietary intake was calculated from 5 repeated food frequency questionnaires collected every 4 years until 2002. SCF score was assessed twice (2008 and 2012) using a 6-item questionnaire. For orange juice drinkers, compared to <1 serving/month, daily consumption was associated with a substantially and significantly lower odds of poor subjective cognitive function.¹¹

Juice impacts on cognition and brain blood flow. A total of 24 healthy young adults aged 18-30 years underwent cognitive testing at baseline and 2 hours after drinking 500ml of a high-flavanone (70-5mg) citrus juice and an energy and vitamin C- matched, zero-flavanone control drink. A further sixteen, healthy, young adults were recruited for functional MRI assessment, where cerebral brain flow was measured at baseline as well as at 2 hours and 5 hours after the drinks. The juice was associated with significantly increased blood flow to certain parts of the brain and significantly improved performance on the Digit Symbol Substitution Test cognitive test. These results demonstrate that consumption of flavanone-rich citrus juice in quantities commonly consumed can acutely enhance blood flow to the brain in healthy, young adults.¹² Perhaps orange juice at breakfast on a Uni or work day is not a bad idea after all.

Juice is also good for older adults too. A high-flavanone (305mg) 100% orange juice (and an equicaloric low-flavanone (37mg) orange-flavoured cordial (500mL)) were consumed daily for 8 weeks by 37 healthy older adults (average age 67 years) in a crossover, double-blind, randomised study. Global cognitive function was significantly better after 8 weeks of flavanone-rich juice than after 8 weeks of the low-flavanone cordial. No significant effects on mood or blood pressure were observed.¹³

Orange juice is also a source of fluids and just a small loss of body fluid (less than 1 %) is enough to affect brain function and mood.¹⁴ Dehydration is a reliable predictor of impaired cognition as dehydration is thought to effect energy production in brain cells and reduce transmitters involved in learning and memory.¹⁵ These can also occur with aging.¹⁶

Starting the day with a mood-boosting, brain-activating orange juice sounds like a good way to get the most out of your day. And when you're feeling the squeeze drink orange juice to refresh and de-stress.

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NIP nutrient composition database references

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^ Rangel-Huerta OD, Aguilera CM, Martin MV, et al. Normal or High Polyphenol Concentration in Orange Juice Affects Antioxidant Activity, Blood Pressure, and Body Weight in Obese or Overweight Adults. *J Nutr.* 2015;145(8):1808-1816. doi:10.3945/jn.115.213660 <https://academic.oup.com/jn/article-pdf/145/8/1808/30061054/jn213660.pdf>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

^^^ Bestwick C, Scobbie L, Milne L, et al. Fruit-Based Beverages Contain a Wide Range of Phytochemicals and Intervention Targets Should Account for the Individual Compounds Present and Their Availability. *Foods.* 2020;9(7):E891. doi:10.3390/foods9070891 <https://www.mdpi.com/2304-8158/9/7/891/pdf>

SEARCH TERMS USED FOR PUBMED: Orange juice and/or *Citrus sinensis* and review and diet and [mood/ psychological wellbeing/ optimism/ brain/ cognition/]

45. PAPAYA A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

Papaya happy? Get your paws on some paw paw

Papaya higher... state of being

- Papaya/paw paw is loaded with vitamin C to care for your psychological wellbeing.
- Rich colourful carotenoids in papaya/paw paw help de-clutter your mind.
- Folate in papaya/paw paw helps beat the slump and energise your day

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie papaya/paw paw.

Papaya/ Paw Paw:

- ✓ Loaded with vitamin C – emotional wellbeing
- ✓ Rich in folate – fight fatigue
- ✓ Source of fibre – happy gut
- ✓ Contains potassium – steady nerves
- ✓ Contains beta-carotene – antioxidant protection
- ✓ Contains polyphenols – free radical fighter

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Papaya/ Paw Paw fun facts:

- Papaya is a tropical fruit native to Central America - also known as paw paw.¹
- There are two varieties in Australia: the very sweet red papaya with bright orange/pink flesh and the less sweet yellow paw paw with deep yellow/orange flesh.²
- It is said Christopher Columbus called papaya “the fruit of the angels”.
- Fresh papaya/paw paw is amazing for dessert and transforms on your favourite wholegrain breakfast cereal. Unripe or green papaya is used in Southeast Asian cooking, either cooked or raw.¹
- Papaya contains an enzyme called papain - great for tenderising meat.
- Papaya leaves can be made into a tea that is thought to have medicinal benefits.¹
- Did you know Papaya extracts are used in paw paw cream/ointment for nappy rash, minor burns, cuts and grazes for its antibacterial properties?³

NUTRITION INFORMATION

Serving size: 150g (1 cup diced raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	134g		89g
Energy	213kJ	2%	142kJ
Protein	0.6g	1%	0.4g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	10.4g	3%	6.9g
Sugars	10.4g	12%	6.9g
Dietary fibre	3.5g	12%	2.3g
Sodium	11mg	<1%	7mg
Potassium	210mg		140mg
Folate eq	55.5ug	28%	37ug
Vitamin C	90mg	225%	60mg
Total polyphenols^	81mg GAE		54mg GAE
Beta-carotene eq	1370ug		915ug
Lycopene^	2740ug		1830ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

References for website:

1. <http://justfunfacts.com/interesting-facts-about-papayas/>
2. <https://australianpapaya.com.au/about/varieties/>
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NIP nutrient composition database references

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR PAPAYA

Individual consumer friendly nutrient content and permitted general level health claims:

- Get your paws on paw paw - 1 cup of diced papaya/paw paw is loaded with vitamin C, containing more than double the daily recommended amount. Vitamin C is important for psychological and emotional wellbeing.
- A 150g serve of papaya/paw paw is rich in folate to help fight fatigue and reduce tiredness - contains 28% of the daily recommended amount.
- Enjoy a cup of diced papaya/paw paw at breakfast and get nearly 4g of fibre to help nourish the gut microbiome.
- Papaya/paw paw (150g) contains 210mg potassium to keep your nerves steady by maintaining nervous system function.
- The beautiful orange-pink colour of pawpaw is due to beta-carotene (1370ug) and lycopene (2740ug) in a 150g serve. They help protect body cells from oxidative stress and damage.
- Papaya/paw paw contains 80mg of antioxidant polyphenols to help fight free radical damage.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as papaya/paw paw, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as papaya/paw paw is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Papaya or paw paw is the exotic and interesting member of the tropical fruit family due to its dramatic appearance inside, musky flavour notes and buttery smooth texture. Its use as a delicious food with health benefits stretches back thousands of years to the ancient Mayans who called it the "tree of life" and used it in folk medicines. There is now modern science to back up its reputation as a feel-good food.

NUTRITION INFORMATION

Serving size: 150g (1 cup diced raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	134g		89g
Energy	213kJ	2%	142kJ
Protein	0.6g	1%	0.4g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	10.4g	3%	6.9g
Sugars	10.4g	12%	6.9g
Dietary fibre	3.5g	12%	2.3g
Sodium	11mg	<1%	7mg
Potassium	210mg		140mg
Folate eq	55.5ug	28%	37ug
Vitamin C	90mg	225%	60mg
Total polyphenols^	81mg GAE		54mg GAE
Beta-carotene eq	1370ug		915ug
Lycopene^	2740ug		1830ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

The phytochemical cocktail within papaya/paw paw

Papaya contains a wide variety of bioactive compounds including alkaloids, phenolics, flavonoids, carotenoids, tannins and saponins, as well as the protein digesting enzymes papain and chymopapain. These enzymes make papaya an excellent meat tenderiser because it helps break down the protein fibres in the meat. These enzymes also have anti-inflammatory effects in the body. Papaya is traditionally used in the treatment of various ailments including inflammatory conditions. A review of studies found extracts of papaya and the phytochemicals in papaya do show anti-inflammatory effects as well as positive effects on the immune system. Although clinical studies on real people measuring health outcomes are needed.¹ All this is important because inflammation is implicated in poor mental health ²

Papaya may have beneficial effects on the cardiovascular system through its antioxidant effects by preventing harm caused by free radicals.³ Papaya's antioxidant ability is helpful for mood because the brain is considered highly susceptible to oxidative stress, a state implicated in psychological disorders such as depression, anxiety, emotional stress and brain degenerative diseases.⁴ The cardiovascular benefits of papaya may help with mood because cardiovascular risk factors contribute to the risk of stroke and negatively influence overall brain health.⁵

Papaya the stress buster

Everyday stress such as stress arising from a job – or the lack of a job - is called psycho-social stress. Evidence is growing that this has negative effects in the body because it creates higher levels of oxidative stress (damage caused by free radicals) and inflammation. An Italian study of adults living a stressful lifestyle found giving them a fermented papaya preparation for one month helped to normalise chemical markers of oxidative stress in their bodies. The researchers suggest papaya has potential as a functional food to combat stress.⁶

The benefits behind the attractive colours of papaya/paw paw

The gorgeous colours of papaya/paw paw are due to the presence of carotenoids including beta-carotene, lycopene and beta-cryptoxanthin, which are very well absorbed in the body.⁷ Carotenoids have several health benefits. Firstly, they act as precursors to vitamin A (called provitamin A), and they also have antioxidant activity that protects cells and tissues and enhance immune function.⁸ A study in middle aged women found those who ate higher amounts of both alpha- and beta-carotene were less likely to report symptoms of depression.⁹

Why you need a plant food rich diet including papaya to feel good

Papaya/paw paw are part of a larger plant food family that can help improve your health and mood. There is now good evidence that higher fruit and vegetable intake is related to better mental health. People who eat more fruit and vegetables have lower rates of depression, perceived stress, and negative mood. And they also have a higher likelihood of optimal mental states, such as greater happiness, positive mood and life satisfaction.¹⁰ There is also evidence that eating fruit such as papaya/paw paw may enhance emotional wellbeing in both adults and children.¹¹

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NIP nutrient composition database references

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 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Papaya or paw paw or *Carica papaya* and mood/carotenoids

46. PASSIONFRUIT A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Get passion-ate about life. Passionfruit energises the mind thanks to its vitamin C.
- Passionfruits' clever carotenoids inside help boost antioxidant defence.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie passionfruit.

Passionfruit:

- ✓ Source of vitamin C – energised mind
- ✓ Source of fibre – happy gut
- ✓ Contains polyphenols – antioxidant protection
- ✓ Contains colourful carotenoids – antioxidant defence

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Passionfruit fun facts:

- Passionfruit originated in South America and got its name from Spanish missionaries who saw the flower as a symbol of The Passion of Christ.¹
- A passionfruit is ripe when the skin is wrinkled- store it in the fruit bowl until it gets all wrinkly.¹
- Did you know the passionfruit is actually a berry?²
- Passionfruit is delicious on yoghurt or ice cream; atop pavlova; in mixed juices (including mocktails); or fruit salad.
- In Mexico, passionfruit is eaten with chilli powder and lime!²
- Passionflower is a traditional remedy used to soothe the nervous system and ease anxiety.³

NUTRITION INFORMATION

Serving size: 40g (2 passionfruit raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	30g		74g
Energy	122kJ	1%	304kJ
Protein	1.2g	2%	3g
Total fat	0.1g	<1%	0.3g
Saturated fat	0g	0%	0g
Total Carbohydrates	2.3g	1%	5.7g
Sugars	2.3g	3%	5.7g
Dietary fibre	5.6g	19%	13.9g
Sodium	8mg	<1%	19mg
Niacin eq	1.3mg	13%	3.2mg
Vitamin C	7.2mg	18%	18mg
Total polyphenols^^	23mg		57mg
Beta-carotene eq	300ug		750ug

Source: Aust Food Comp Data or ^^Phenol explorer database

*based on an average adult diet of 8700 kJ
“<” means less than

References for website:

1. <https://produceforkids.com/produce-tips/passion-fruit/>
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NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL

<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^ Phenol explorer database available at <http://phenol-explorer.eu/contents/food/910>

SUBSTANTIATION FOR PASSIONFRUIT

Individual consumer friendly nutrient content and permitted general level health claims:

- Two passionfruits provide almost one fifth of the daily recommended amount vitamin C required for an energised mind; psychological and nervous system function and energy metabolism.
- Passionfruits are fibre-rich - 40g of pulp from two passionfruits contains about 6g of fibre to support gut health and nourish gut bacteria.
- The polyphenols in passionfruit help to quell free radicals and protect cells from oxidative damage.
- The delightful orange colour of passionfruit pulp is due to the presence of beta-carotene carotenoid that protect the brain from oxidative stress so you can think clearly.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as passionfruit, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as passionfruit is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 40g (2 passionfruit raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	30g		74g
Energy	122kJ	1%	304kJ
Protein	1.2g	2%	3g
Total fat	0.1g	<1%	0.3g
Saturated fat	0g	0%	0g
Total Carbohydrates	2.3g	1%	5.7g
Sugars	2.3g	3%	5.7g
Dietary fibre	5.6g	19%	13.9g
Sodium	8mg	<1%	19mg
Niacin eq	1.3mg	13%	3.2mg
Vitamin C	7.2mg	18%	18mg
Total polyphenols^^	23mg		57mg
Beta-carotene eq	300ug		750ug

Source: Aust Food Comp Data or ^^Phenol explorer database

*based on an average adult diet of 8700 kJ
" < " means less than

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

From the evocative name to the tantalising tang on the tongue, passionfruit have much to get excited about. Why not add a splash of passion to your life to boost your mind and mood.

Helpful compounds in passionfruit

Passionfruit contains phenolic acids and flavonoids such as catechins. The most abundant polyphenols are catechin, epicatechin, and rosmarinic acid, but caffeic, *p*-coumaric and ferulic acids have also been identified. While tropical fruit flavonoids have been demonstrated to have antioxidant action that control free radicals, those in passionfruit have also shown an anti-inflammatory ability in the gut. This is useful because intestinal barrier function has been recognised as an important contributor to development of chronic inflammation, and maintaining intestinal barrier function is important for digestive health. Consumption of polyphenols inhibits chronic intestinal inflammation in mice and has been demonstrated in human colon cells, which suggests consumption of passionfruit could benefit intestinal health.¹ Along with helpful fibre in passionfruit, polyphenols may enhance mood through

the microbiota-gut-brain axis and enhance resilience against stresses through effects on the gut bacteria.²

Passionfruit seeds are also small and mighty. Piceatannol and scirpusin B are strong antioxidant phytochemicals present in passionfruit seeds and these may have anti-aging benefits for the skin including improving moisture in dry skin and reducing skin fatigue.³ Looking younger certainly can boost your mood!

Add a splash of passionfruit to your fruit consumption for your mind and mood

The social media tag #finishthedish is very appropriate for passionfruit because a little goes a long way to add delectable deliciousness to any fruit dish. Enjoying fruit regularly not only gives us the pleasure of natural sweetness but also can also sweeten our overall outlook. In both adults and children increased fruit intake has been found to improve psychological wellbeing.⁴ And eating fruit as a snack is associated with less anxiety and emotional distress.⁵

Why you should be passion-ate about enjoying a plant-based diet

Eating more fruit such as passionfruit, vegetables, mushrooms and nuts is a healthy step towards a good mood. This positive effect on psychological wellbeing is due to the many bioactive compounds (such as phytochemicals and antioxidants) and other nutrients in whole foods working together to deliver healthy brain function.⁶

One study provides good support for fruit and vegetables being good for mental health. Researchers reviewed 61 studies and found high total intake of fruit and vegetables was associated with higher levels of optimism and self-efficacy, reduce levels of psychological distress and fewer depressive symptoms.⁷

There's so many good reasons to eat more fruit and veg, and passionfruit makes it easy - drizzle it over other fruit because it's so darned delicious.

References for substantiation

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SEARCH TERMS USED FOR PUBMED: Passionfruit and/or *Passiflora edulis* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

47. PEACH A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Life's peachy with vitamin C-rich peaches.
- Niacin in peaches will get you feeling peachy, as it supports psychological wellbeing.
- Peechey keen for vitamin E - natural antioxidant protection.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie peaches.

Peach:

- ✓ Rich in vitamin C – feeling peachy
- ✓ Source of niacin – positive mood
- ✓ Source of vitamin E – antioxidant protection
- ✓ Contains polyphenols – antioxidant protection
- ✓ Contains potassium – nerve function
- ✓ Contains natural fruit sugars – natural energy
- ✓ Low Glycemic Index carbs – sustained energy
- ✓ Source of fibre – gut health
- ✓ Contains fluids – contributes to hydration

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Peach fun facts:

- The term, “you’re a real peach” originated from the tradition of giving a peach to the friend you liked.
- The peach is a member of the *Rosaceae* family, distinguished by its velvety skin. They’re considered drupes or stone fruit because their flesh surrounds a shell that houses a seed.
- The fresher and riper the peach, the higher the levels of antioxidants.^{1,2}
- Fresh and unpeeled canned peaches seem to have similar amounts of vitamins and minerals^{3,4}, although fresh peaches have higher levels of antioxidants.⁴
- To enjoy peaches beyond summer, use very ripe peaches to make a preserved peach chutney and serve with meats throughout the rest of the year.

NUTRITION INFORMATION

Serving size: 150g (1 peach raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	131g		87g
Energy	252kJ	3%	168kJ
Protein	1.2g	2%	0.8g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	11.7g	4%	7.8g
Sugars	11.1g	12%	7.4g
Dietary fibre	2.9g	10%	1.9g
Sodium	3mg	<1%	2mg
Potassium	305mg		203mg
Niacin eq	1.5mg	15%	1.0mg
Vitamin C	12mg	30%	8mg
Vitamin E	1.1mg	11%	0.7mg
Total polyphenols^	200mg GAE		133mg GAE
Beta-carotene eq	186ug		124ug
Glycemic Index (GI)^	42 (low)		

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

GI =42 average of 2

“<” means less than

GAE means Gallic Acid Equivalents

References for website:

- 1 Rossato SB, Haas C, Raseira Mdo C, Moreira JC, Zuanazzi JA. Antioxidant potential of peels and flesh of peaches from different cultivars. *J Med Food*. 2009;12(5):1119-1126. doi:10.1089/jmf.2008.0267. <https://pubmed.ncbi.nlm.nih.gov/19857078/>
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- 4 Campbell O & Padilla-Zakour O. Phenolic and carotenoid composition of canned peaches (*Prunus persica*) and apricots (*Prunus armeniaca*) as affected by variety and peeling. *Food Research International*.2013; 54:448-455. 10.1016/j.foodres.2013.07.016.
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NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>
 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>
 ^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SUBSTANTIATION FOR PEACH

Individual consumer friendly nutrient content and permitted general level health claims:

- Eat a peach and you're sure to feel peachy thanks to a peach containing a third your daily vitamin C needs. Good for psychological wellbeing.
- Eating a moist and juicy peach is the perfect way to start your day. With 15% of your daily niacin needs in one peach, you're sure to feel good.
- Vitamin E is a powerful antioxidant that protects all body cells from free radical damage. Eating one peach will give you 11% of your daily vitamin E requirements. Peachy keen to eat one aren't you!
- Peaches provide 200mg of polyphenol antioxidants in every serve, to help protect your body cells from free radical damage.
- Peaches contain just over 300mg potassium in a serve. Potassium supports healthy nerve function.
- Peaches contain 11g of fruit sugars in a serve – your body's perfectly natural energy source.
- Nothing says summer quite like a peach. With its low Glycemic Index of 42, it will give sustained energy to play all day.
- Keep your gut bacteria happy and well-fed. Enjoy a peach to get 3g of fibre.
- Summer and peaches go hand in hand. With 87% moisture, they will help keep your body hydrated.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as peaches is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 150g (1 peach raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	131g		87g
Energy	252kJ	3%	168kJ
Protein	1.2g	2%	0.8g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	11.7g	4%	7.8g
Sugars	11.1g	12%	7.4g
Dietary fibre	2.9g	10%	1.9g
Sodium	3mg	<1%	2mg
Potassium	305mg		203mg
Niacin eq	1.5mg	15%	1.0mg
Vitamin C	12mg	30%	8mg
Vitamin E	1.1mg	11%	0.7mg
Total polyphenols^	200mg GAE		133mg GAE
Beta-carotene eq	186ug		124ug
Glycemic Index (GI)^^	42 (low)		

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

GI =42 average of 2

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Peaches are one of the delectable summerfruit with soft velvety skin and juicy smooth flesh. Summerfruit season is what makes summer so special in Australia and they should be enjoyed as often as possible. Not only because of their unique fruity flavour, but because of the nutritious benefits they contain to support a good mood and positive mental health.

We know that eating more fruit such as peaches is beneficial for a positive outlook, as a systematic review of 61 studies that considered a number of mood characteristics ranging from general and mental wellbeing, to creativity, optimism and self-esteem, found that high total intake of fruit and vegetables promoted higher levels of optimism and self-efficacy, as well as reduce levels of psychological distress.¹

Peaches contain a number of antioxidants including vitamin E, the orange pigment beta-carotene and polyphenols, which may play a role in maintaining brain health.²

Polyphenol-containing foods like peaches are a big feature in the Mediterranean Diet which has positive effects on cognition.^{3,4}

Beta-carotene is an antioxidant which has been linked to higher levels of optimism.⁵

Peaches are super juicy, containing 87% moisture that can contribute to your total body fluids, helping you to keep hydrated in the heat of summer. Getting enough fluids is important for brain function, emotional wellbeing and mood. Studies in adults show just a small loss of body fluids (around 1%) is enough to increase negative emotions such as anger, confusion, tension, anxiety and depression, while consuming fluids can improve cognitive function and mood.⁶

Life sure can be peachy when you enjoy a ripe peach. This favourite summerfruit can also improve your mood, as research has shown that people who eat a lot of fruit are more likely to have greater life satisfaction and more positive moods.⁷

References for substantiation

- 1 Głąbska D, Guzek D, Groele B, Gutkowska K. Fruit and Vegetable Intake and Mental Health in Adults: A Systematic Review. *Nutrients*. 2020;12(1):115. doi:10.3390/nu12010115 <https://pubmed.ncbi.nlm.nih.gov/31906271/>
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- 3 Tangney CC, Kwasny MJ, Li H, et al. Adherence to a Mediterranean-type dietary pattern and cognitive decline in a community population. *Am J Clin Nutr*. 2011;93(3):601-607. doi:10.3945/ajcn.110.007369 <https://pubmed.ncbi.nlm.nih.gov/21177796/>
- 4 Tsivgoulis G, Judd S, Letter AJ, et al. Adherence to a Mediterranean diet and risk of incident cognitive impairment. *Neurology*. 2013;80(18):1684-1692. doi:10.1212/WNL.0b013e3182904f69 <https://pubmed.ncbi.nlm.nih.gov/23628929/>
- 5 Boehm JK, Williams DR, Rimm EB, et al. Association between optimism and serum antioxidants in the midlife in the United States study. *Psychosom Med*. 2013;75(1):2-10. doi:10.1097/PSY.0b013e31827c08a9 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3539819/>
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NIP nutrient composition database references

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<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SEARCH TERMS USED FOR PUBMED: Peach or *Prunus persica* and review and diet and [mood/psychological wellbeing/ optimism/ brain function/ cognition/]

48. PEAR A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Need a pick me up? Pick Pears. Rich in folate for a better mood and brighter mind.
- Need a pick me up? Pick Pears. Jammed packed with natural fruit sugars and low GI carbs for energy.
- Avoid a bare pear – eat the skins for gut loving fibre.

Campaign taglines:

- Eat on the Bright side. Naturally boost your mood with Australian/Aussie Pears.

Pear:

- ✓ Rich in folate – psychological wellbeing
- ✓ Good source of gut-loving fibre
- ✓ Contain natural fruit sugars - for an energy boost
- ✓ Low GI carbs - for long lasting energy
- ✓ Contains polyphenols - natural antioxidants

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity page)

Pear fun facts:

- Dare to pear – with three main varieties try ‘em all. The green-skin Packham and Williams pears; and the Beurré Bosc pears with a pretty red blush.
- Don’t eat a bare pear – keep the skins on there’s loads of vital antioxidants, colourful pigments and gut-loving fibre in the skins.¹
- Pears contains pectin a type of soluble fibre¹ which helps keep hearts healthy^{2,3} and is great for thickening jams.
- Pears contain sorbitol a type of sugar that helps keep you regular¹ but if you’re following a low FODMAP diet you may need to avoid sorbitol.
- To check for ripeness press gently near the stem. If it gives a little, it’s ready to eat.
- Ripen pears by placing in a brown paper bag with a banana or apple.
- Pear trees arrived in Australia with the First Fleet in 1787.
- Pears have been used in China as a traditional folk remedy for 2000years.¹
- Pears like apples are pome fruit – they have a compartmented core.¹

NUTRITION INFORMATION

Serving size: 150g (1 pear unpeeled raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	126g		84g
Energy	420kJ	5%	278kJ
Protein	0.6g	1%	0.4g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	22.8g	7%	15.2g
Sugars	18.6g	21%	12.4g
Dietary fibre	4.5g	15%	3g
Sodium	0mg	0%	0mg
Folate eq	66ug	33%	44ug
Total polyphenols^	267mg GAE		178mg GAE
Anthocyanins**	10mg		6.8mg
Beta-carotene eq	33ug		22ug
Glycemic index (GI)^	38 (low)		
Sorbitol	4.2mg		2.8mg

Source: Aust Food Comp Data or ^ USDA

**Dussi et al (red pear only)

GI = 38 (average of 4)

*based on an average adult diet of 8700 kJ

GAE means Gallic Acid Equivalents

References for website:

- 1 Reiland H, Slavin J. Systematic Review of Pears and Health. *Nutr Today*. 2015;50(6):301-305. doi:10.1097/NT.0000000000000112 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4657810/pdf/nt-50-301.pdf>
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NIP nutrient composition references:

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem.* 2006;54(11):4069-4075. doi:10.1021/jf060300I <https://pubmed.ncbi.nlm.nih.gov/16719536/>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

**Dussi M, Sugar D & Wrolstad, R. Characterizing and Quantifying Anthocyanins in Red Pears and the Effect of Light Quality on Fruit Color. *Journal of the American Society for Horticultural Science.* 1995;120. 785-789. 10.21273/JASHS.120.5.785. https://www.researchgate.net/publication/279894106_Characterizing_and_Quantifying_Anthocyanins_in_Red_Pears_and_the_Effect_of_Light_Quality_on_Fruit_Color

SUBSTANTIATION FOR PEAR

Individual consumer friendly nutrient content and permitted general level health claims:

- Pears are nature's energy booster – they're rich in folate with one pear providing a third of your daily folate needs. Folate is essential for normal psychological function and helps reduce tiredness and fatigue.
- Pears contain natural fruit sugars and low GI carbs for longer lasting energy (GI=38).
- Avoid a bare pear – eat the skins they're a good source of fibre – 5g or 15% of an adult's daily fibre requirement.
- Pears also contain sorbitol – a type of sugar which also helps soften stools and maintains a healthy bowel function.
- A pear contains 267ug of total polyphenols - natural antioxidants for cell protection from free radical damage.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity page)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as pears, vegetables, nuts and mushrooms is good for brain function, mental health, psychological wellbeing and mood.

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as pears is good for psychological wellbeing and happiness.

- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 150g (1 pear unpeeled raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	126g		84g
Energy	420kJ	5%	278kJ
Protein	0.6g	1%	0.4g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	22.8g	7%	15.2g
Sugars	18.6g	21%	12.4g
Dietary fibre	4.5g	15%	3g
Sodium	0mg	0%	0mg
Folate eq	66ug	33%	44ug
Total polyphenols^	267mg GAE		178mg GAE
Anthocyanins**	10mg		6.8mg
Beta-carotene eq	33ug		22ug
Glycemic index (GI)^^	38 (low)		
Sorbitol	4.2mg		2.8mg

Source: Aust Food Comp Data or ^ USDA

**Dussi et al (red pear only)

GI = 38 (average of 4)

*based on an average adult diet of 8700 kJ
GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Things going pear-shaped? You'll be OK just get FRU-IT - pears are the perfect pick me up! They contain a variety of nutrients, antioxidants and pigments which keep the brain in tip top shape.

Pears are a source of phytochemicals, especially antioxidants. The dominant antioxidants include: arbutin, oleanolic acid, ursolic acid, chlorogenic acid, epicatechin, and rutin found in both pear peel and flesh. Although these chemicals in pear peel are approximately 6 to 20 times higher than those in the flesh of the pear. So peeling pears leads to a 25% drop in total polyphenols. Researchers have found a good correlation between the total polyphenol content of pears and the radical-trapping antioxidant potential. While there is no direct evidence of the benefit of pears on brain function, increasing apple and pear consumption is linked with a reduced risk of stroke. Flavonoid-rich foods associated with a significant reduction in cardiovascular disease includes apples or pears.¹

Vegetables and fruit such as pears are a must-have brain food and here's why. An analysis of 61 different studies found a high intake of fruit and vegetables promoted higher levels of optimism and self-efficacy – confidence in yourself that you can manage what life throws at you. These fruit and veggie eaters also had less psychological distress and feeling vague. So there's no doubt fruit and vegetables have a positive influence on mental health and the general recommendation to consume at least 5 serves of fruit and vegetables a day is just common sense.²

The same researchers also reviewed 17 studies in adolescents this time and found a higher fruit and vegetable intake means better mental health in young people. Mental health defined as a better quality of health, mental health status, happiness and self-esteem as well as less anxiety, stress and distress, and depressive symptoms. The strongest benefits were found for green vegetables, yellow vegetables and fresh fruit.³

Pears will keep the happiness coming – a study of 12,385 Australian adults surveyed over several years found fruit and vegetable consumption was predictive of increased happiness, life satisfaction and wellbeing.⁴

If you're not feeling your best it may be you need a little more fruit and veg. Feelings of vitality, flourishing and motivation were improved when young adults who ate little fruit and veg started eating two additional servings of fruit and vegetables each day. This significantly improved their psychological wellbeing.⁴ Another study in young adults found higher fruit and vegetable consumption predicted more intense feelings of curiosity, greater creativity, and greater "eudaemonic" wellbeing. Pronounced "you-day-mon-ic" this is a state of "flourishing" meaning feeling more of engaged, having meaning, being curious and creative and having purpose in life. On the days these young people ate more fruit and vegetables they reported greater eudaemonic wellbeing, curiosity and creativity compared to days they ate less.⁶

Anthocyanins are present in pears – especially the varieties with the pretty pink/red blush. Anthocyanins are phytochemicals that may have a protective effect on the brain by improving cognitive performance and memory.^{7,8}

References for substantiation

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NIP nutrient composition references:

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem*. 2006;54(11):4069-4075. doi:10.1021/jf060300l <https://pubmed.ncbi.nlm.nih.gov/16719536/>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

**Dussi M, Sugar D & Wrolstad, R. Characterizing and Quantifying Anthocyanins in Red Pears and the Effect of Light Quality on Fruit Color. *Journal of the American Society for Horticultural Science*. 1995;120. 785-789. 10.21273/JASHS.120.5.785. https://www.researchgate.net/publication/279894106_Characterizing_and_Quantifying_Anthocyanins_in_Red_Pears_and_the_Effect_of_Light_Quality_on_Fruit_Color

SEARCH TERMS USED FOR PUBMED: Pear and/or *Pyrus communis* and review and diet and [mood/psychological/wellbeing/ brain function/ cognition/]

49. PECAN A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Perk up with pecans – rich in manganese to fight fatigue.
- Pecan pick me up – brimming with biotin to feel good.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie pecans.

Pecan:

- ✓ Rich in manganese – fights fatigue
- ✓ Brimming with biotin – psychological wellbeing
- ✓ Source of antioxidant vitamin E
- ✓ Source of thiamin – positive energy
- ✓ Source of niacin – the energiser
- ✓ Source of magnesium – merry mind and body
- ✓ Source of zinc – clever cognition
- ✓ Source of dietary fibre – gut goodness
- ✓ Contains antioxidant polyphenols – fights free radicals
- ✓ Contains anthocyanins – antioxidant protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Pecan fun facts:

- “Pecan” is a Native American word of Algonquin origin used to describe all nuts requiring a stone to crack them.
- A pecan, is not truly a nut, but is technically a drupe, a fruit with a single stone or pit, surrounded by a husk.
- Pecans improve heart health and diabetes risk factors.^{1,2}
- About 80 pecans are used in the average pecan pie.
- How do you say pecan – “pee-can” or “peh-carn” – no one can agree.

References for website:

- 1) McKay DL, Eliasziw M, Chen CYO, Blumberg JB. A Pecan-Rich Diet Improves Cardiometabolic Risk Factors in Overweight and Obese Adults: A Randomized Controlled Trial. *Nutrients*. 2018;10(3):339. doi:10.3390/nu10030339 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5872757/>
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NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^ Chen CY, Blumberg JB. Phytochemical composition of nuts. *Asia Pac J Clin Nutr*. 2008;17 Suppl 1:329-332. <http://apjcn.nhri.org.tw/server/APJCN/17%20Suppl%201//329.pdf>

NUTRITION INFORMATION

Serving size: 30g (15 raw pecans raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	1.1g		3.5g
Energy	892kJ	10%	2970kJ
Protein	2.9g	6%	9.8g
Total fat	21.6g	31%	71.9g
Saturated fat	1.4g	6%	4.5g
Monounsaturated fat	11.8g		39.3g
Polyunsaturated fat	7.5g		25g
Total Carbohydrates	1.5g	<1%	4.9g
Sugars	1.3g	1%	4.3g
Dietary fibre	2.5g	8%	8.4g
Sodium	1mg	<1%	3mg
Thiamin	0.1mg	11%	0.42mg
Niacin eq	1.1mg	11%	3.6mg
Biotin	7.5ug	25%	25ug
Vitamin E	1.7mg	17%	5.6mg
Magnesium	33mg	10%	110mg
Zinc	1.2mg	10%	3.9mg
Manganese	1.5mg	31%	5.1mg
Total polyphenols^	605mg GAE		2020mg GAE
Beta-carotene eq	8ug		25ug
Anthocyanin^^	148mg		494mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

<https://academic.oup.com/jn/article->

SUBSTANTIATION FOR PECAN

Individual consumer friendly nutrient content and permitted general level health claims:

- Perk up with pecans – rich in manganese to fight fatigue
30g pecans provide 30% of the RDI for manganese.
- Pecan pick me up – brimming with biotin to feel good – 15 pecans contain 25% of the RDI for biotin.
- Half a cup of pecans has 1.7mg of antioxidant vitamin E or 17% of the RDI.
- A 30g handful of pecans delivers 11% of the RDI for thiamin for energy production.
- Snack on a handful of pecans – 30g provides 11% of niacin's RDI to help reduce tiredness and fatigue.
- 30g of pecans for a merry mind and healthy body – they hold 33mg of magnesium (10%RDI) needed for psychological function and energy production.
- Crack open 15 pecans for clever cognition – a 30g serve 10% of the RDI for zinc an essential nutrient for cognitive function.
- 15 pecans provide 2.5g of fibre – gut goodness in a handful.
- Pecans contains powerful polyphenol antioxidants to fight free radicals – 600mg in a 30g serve.
- Pecans and their russet red skins contains anthocyanins for antioxidant protection – 148mg in a 50g serve.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory NUT claim:

- Nuts: Happiness in a handful. A healthy, varied diet containing a variety of nuts such as pecans is good for brain function and psychological wellbeing – putting you in happy mood.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Pecans are the soft textured nut that work well in salads and stuffings, pies and pesto. They're nutrient-rich and one of the highest antioxidant-containing foods – number 14 in a top 100 list for antioxidants overall and top 22 for polyphenols specifically.¹ Antioxidants play an important role in protecting the brain from oxidative stress which is linked to brain disease.^{2,3}

Little research has been done investigating the effects of pecans on brain health individually however nuts in general have positive effects on brain function and psychological wellbeing and mood. Nuts are linked with better brain health through better cognitive function, learning, memory, psychological wellbeing and mood.⁴ Nuts will keep your happy, motivated and sharp.

NUTRITION INFORMATION

Serving size: 30g (15 raw pecans raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	1.1g		3.5g
Energy	892kJ	10%	2970kJ
Protein	2.9g	6%	9.8g
Total fat	21.6g	31%	71.9g
Saturated fat	1.4g	6%	4.5g
Monounsaturated fat	11.8g		39.3g
Polyunsaturated fat	7.5g		25g
Total Carbohydrates	1.5g	<1%	4.9g
Sugars	1.3g	1%	4.3g
Dietary fibre	2.5g	8%	8.4g
Sodium	1mg	<1%	3mg
Thiamin	0.1mg	11%	0.42mg
Niacin eq	1.1mg	11%	3.6mg
Biotin	7.5ug	25%	25ug
Vitamin E	1.7mg	17%	5.6mg
Magnesium	33mg	10%	110mg
Zinc	1.2mg	10%	3.9mg
Manganese	1.5mg	31%	5.1mg
Total polyphenols^	605mg GAE		2020mg GAE
Beta-carotene eq	8ug		25ug
Anthocyanin^^	148mg		494mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Eating nuts improves your brain function and cognition – your ability to process information and experiences. A review by University of South Australia researchers, of more than 70 studies, found a 30g handful of nuts enjoyed daily may improve mental processes such as memory, problem solving and decision making. It may be nuts' ability to reduce inflammation and improve blood flow that's key.⁵

An Australian Mediterranean diet study found those eating more nuts had greater reduction in depression and improved mental health scores which were sustained over 6 months.⁶ A Chinese study of some 13,600 people found those eating nuts at least one a week had an 18% reduction in depression risk compared to those eating nuts less than once a week.⁷ The Australian SMILES trial with 67 participants found improvements in ratings of depression after 12 weeks of a special diet which included a daily serving of nuts.⁸ The same research team also identified magnesium and zinc as key nutrients linked to lower depressive scores – nutrients found naturally in nuts such as pecans.⁹ Nuts have also been found to reduce anxiety in men – high nuts eaters were 66% less anxious than low nut eaters.¹⁰

There's never been a better time to get stuck into nuts like pecans – a handful a day is all you need for feeling good and functioning effectively – a good mood food.

References for substantiation

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NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^ Chen CY, Blumberg JB. Phytochemical composition of nuts. *Asia Pac J Clin Nutr*. 2008;17 Suppl 1:329-332. <http://apjcn.nhri.org.tw/server/APJCN/17%20Suppl%201/329.pdf>

SEARCH TERMS USED FOR PUBMED: Pecan and/or *Carya illinoensis* and review and diet and [mood/psychological wellbeing/ optimism/ brain/ cognition/ inflammation/ prebiotic/ microbiome]

50. PERSIMMON A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Good as Gold! Persimmons offer a wealth of health thanks to vitamin C to boost your brain's bank balance.
- Persimmons are dripping with the golden goodness of carotenoids to help you slide through stress.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie persimmons.

Persimmon:

- ✓ Loaded with vitamin C – psychological wellbeing
- ✓ High in fibre – happy gut
- ✓ Source of niacin – maintain energy
- ✓ Source of vitamin E – antioxidant protection
- ✓ Contains colourful carotenoids – antioxidant defence
- ✓ Contains polyphenols – fight free radicals

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Persimmon fun facts:

- Persimmons are native to China and the most common cultivated is the sweet (non-astringent) variety, fuyu.¹
- Persimmons have been grown in Australia since the late 1970s and are available in autumn and winter.
- Persimmons can be eaten raw like an apple, or when very ripe the flesh can be scooped out of the skin with a spoon.
- Did you know persimmons belong to the berry family² and their peel is edible?¹
- Ripe and sweet persimmon is delicious on its own or with yoghurt, ice cream, breakfast cereal, or in baking.

NUTRITION INFORMATION

Serving size: 150g (2 small persimmons raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	120g		80g
Energy	447kJ	5%	298kJ
Protein	0.9g	2%	0.6g
Total fat	0.3g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	24.2g	8%	16.1g
Sugars	24.2g	27%	16.1g
Dietary fibre	3.9g	13%	2.6g
Sodium	9mg	<1%	6mg
Niacin eq	1mg	10%	0.68mg
Vitamin C	21mg	53%	14mg
Vitamin E	1.1mg	11%	0.73mg
Total polyphenols^^	332mg GAE		221 mg GAE
Beta-carotene	1240ug		825ug

Source: Aust Food Comp Data or ^ USDA

^^Butt MS et al 2015

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

1. <https://www.persimmonsaustralia.com.au/about/varieties/>
2. <https://www.thatsitfruit.com/blogs/default-blog/10-interesting-facts-about-persimmons>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^ Butt MS, Sultan MT, Aziz M, et al. Persimmon (Diospyros kaki) fruit: hidden phytochemicals and health claims. *EXCLI J*. 2015;14:542-561. doi:10.17179/excli2015-159 <https://pubmed.ncbi.nlm.nih.gov/27047315/>

SUBSTANTIATION FOR PERSIMMON

Individual consumer friendly nutrient content and permitted general level health claims:

- Persimmons are loaded with vitamin C, with two small persimmons providing half the daily recommended amount. Vitamin C is needed for nervous system function, and psychological and emotional wellbeing.
- Two small persimmons are high in fibre with about 4g. Fibre helps nourish the gut microbiome and maintain gut health.
- Niacin in persimmons is important to fight fatigue and maintain energy levels. A 150g serve contains 10% of the RDI.
- Vitamin E in persimmons provides antioxidant protection to shield the brain body from the stress of free radicals. Two small persimmons provide 11% of the recommended daily amount of vitamin E.
- The deep golden colour of persimmons signals the presence of the antioxidant carotenoid beta-carotene (1240ug in 150g) to protect the body from oxidative stress.
- Persimmons contain 330mg of antioxidant polyphenols that help fight free radicals.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as persimmons, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as persimmons is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

When it comes to the power of food to promote mental wellbeing, persimmons are proof that all that is golden is good. Read on to find out the science behind the magic of this sweet and delicious fruit.

Why persimmons are the golden child of the fruit family

Persimmons are packed with natural phytochemicals and bioactive molecules with many health benefits including proanthocyanidin, carotenoids, tannins, flavonoids, anthocyanin and catechin. These all have potent antioxidant activity. The health benefits of these compounds are many and varied including protection against cardiovascular diseases. ¹

NUTRITION INFORMATION

Serving size: 150g (2 small persimmons raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	120g		80g
Energy	447kJ	5%	298kJ
Protein	0.9g	2%	0.6g
Total fat	0.3g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	24.2g	8%	16.1g
Sugars	24.2g	27%	16.1g
Dietary fibre	3.9g	13%	2.6g
Sodium	9mg	<1%	6mg
Niacin eq	1mg	10%	0.68mg
Vitamin C	21mg	53%	14mg
Vitamin E	1.1mg	11%	0.73mg
Total polyphenols^^	332mg GAE		221 mg GAE
Beta-carotene	1240ug		825ug

Source: Aust Food Comp Data or ^ USDA

^^Butt MS et al 2015

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Persimmons contain a flavonoid (subgroup flavonol) called fisetin that has both high antioxidant capacity and anti-inflammatory effects. Fisetin has demonstrated numerous benefits including the protection of nerve cells, protection against stroke and brain tissue loss due to blocked brain blood vessels.² An animal study has demonstrated the antioxidants from persimmon have a protective effect on the brain and nervous system.³

Flavonoid phytochemicals found in fruit may impact cognition and reverse age-related declines in memory and learning. In particular, evidence suggests that foods rich in flavonols have great potential to act on the cognitive processes.⁴

Persimmons are rich in vitamin C and beta-carotene and also contain vitamin E and these are important for the antioxidant defence of cells in the brain and nervous system. Having higher intakes of these nutrients is associated with better cognitive function in older people, and the association is stronger for food sources than supplements.⁵ Persimmons are a truly delightful way to strengthen your antioxidant defences.

Persimmons are a good source of fibre. Diets high in fibre can improve the population of gut bacteria to improve psychological wellbeing. Short chain fatty acids (SCFAs) such as butyrate and propionate are produced by gut bacteria when they ferment fibre in the large intestine. These SCFAs reduce brain inflammation, keeps brain cells healthy and preserves normal brain function and behaviour.⁶

Why you should be happy eating fruit

The science supports what might seem obvious: eating fruit is good for your mind as well as your body. In both adults and children increased fruit intake has been found to improve psychological wellbeing.⁶ In one study, eating raw fruit and vegetables in particular was associated with better mental health.⁷ Fruit is perfect for snacking and may well help you cope better with the challenges life throws at you. A study found eating fruit as a snack compared to a 'sometimes food' such as chocolate or potato crisps, was found to be associated with lower levels of anxiety and emotional distress.⁸ Persimmons can help you snack smarter.

Embrace the whole plant food family for better mood

Eating more fruit such as persimmons, vegetables, nuts, mushrooms really does help you feel better in yourself and better about life. An Australian study found increased fruit and vegetable consumption was predictive of increased happiness, life satisfaction and wellbeing. The increase in life satisfaction from the highest increase in fruit and vegetable consumption (8 portions a day) over the period of two years was equal to the psychological gain of moving from being unemployed to having a job.⁹ What a difference plant foods can make.

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SEARCH TERMS USED FOR PUBMED: Persimmon and/or *diospyros kaki*



51. PINEAPPLE A GOOD MOOD FOOD

WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Don't be prickly – eat vitamin C-rich pineapple to feel refreshed.
- Reach your peak – eat pineapple it's packed with manganese to help with energy production.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie pineapples.

Pineapple:

- ✓ Rich in vitamin C – mood booster
- ✓ Rich in manganese – energy producer
- ✓ Source of folate – psychological wellbeing
- ✓ Source of vitamin B6 – fatigue fighter
- ✓ Contains potassium - nerve communicator
- ✓ Contains polyphenols – antioxidant defender
- ✓ Source of fibre – gut lover
- ✓ Contains natural fruit sugars – energiser

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Pineapple fun facts:

- Pineapple is the only edible fruit of the Bromeliads.
- The pineapple plant produces a striking red purple flower. The individual fruits of the flower join together to create the pineapple. So the pineapple is actually a bunch of “fruitlets” fused together.
- The most common variety grown in Australia is Smooth Cayenne – also used for canned pineapple too.
- Pineapples have a vibrant tropical flavour sweet and tart and are super juicy.
- Pineapple contains a protein bromelain that tenderises meat. So a grilled slice of pineapple is a perfect BBQ partner to meats or burgers.
- Crushed pineapple is used in yogurt, jam, sweets, and ice cream.
- Pineapple juice is refreshing and key ingredient in some cocktails – pina colada anyone?



NUTRITION INFORMATION

Serving size: 165g

(1cup diced or two slices industry derived)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	144g		87g
Energy	294kJ	3%	178kJ
Protein	1g	2%	0.6g
Total fat	0.3g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	13.5g	4%	8.2g
Sugars	13.5g	15%	8.2g
Dietary fibre	3g	10%	1.8g
Sodium	3.3mg	<1%	2mg
Potassium	249mg		151mg
Vitamin B6	0.2mg	11%	0.11mg
Folate eq	29.7ug	15%	18ug
Vitamin C	28.1mg	70%	17mg
Manganese	2.1mg	43%	1.3mg
Total polyphenols^	134mg GAE		81mg GAE
Beta-carotene eq	35ug		21ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

References for website:

<https://australianpineapples.com.au/>

<https://en.wikipedia.org/wiki/Pineapple>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL

<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR PINEAPPLE

Individual consumer friendly nutrient content and permitted general level health claims:

- Don't be prickly – eat vitamin C-rich pineapple to feel refreshed. Two slices of pineapple have 70% of the RDI for vitamin C which contributes to psychological wellbeing.
- Reach your peak – eat pineapple it's packed with manganese and helps with energy production. A cup of diced pineapple contains 43% of the RDI.
- A 165g serve of pineapple is an important source of folate with 15% of the RDI. Folate is needed for psychological wellbeing.
- Vitamin B6 is a fatigue fighter – it helps with energy production and reduces tiredness and fatigue. Two pineapple slices provides 11% of RDI.
- A cup of diced pineapple contains 249mg potassium - an electrolyte for a healthy nervous system.
- Pineapples contain 134mg of polyphenols antioxidants that helps protect cells from free radical damage.
- A 150g serve of pineapple contains 3g of gut-loving fibre necessary for a healthy gut function.
- A cup of diced pineapple contains natural fruit sugars for energy.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as pineapples, vegetables, nuts and mushrooms is good for brain function, mental health, psychological wellbeing and mood.

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as pineapple is good for mental wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Sweet juicy pineapple is sunshine on a cloudy day. Brimming with mood-boosting, brain-boosting nutrients and phytochemicals such as bromelain – an enzyme that can breakdown proteins. These natural compounds have powerful antioxidants and anti-inflammatory properties. A number of animal studies have uncovered the various ways pineapple can help with brain function.

Bromelain has anti-inflammatory effects as it decreases immune system cells (neutrophils) involved in inflammation processes.¹ Bromelain was also found to degrade proteins involved in the development of Alzheimer's Disease found in the spinal fluid of Alzheimer's Disease patients in vitro.²

NUTRITION INFORMATION

Serving size: 165g

(1cup diced or two slices industry derived)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	144g		87g
Energy	294kJ	3%	178kJ
Protein	1g	2%	0.6g
Total fat	0.3g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	13.5g	4%	8.2g
Sugars	13.5g	15%	8.2g
Dietary fibre	3g	10%	1.8g
Sodium	3.3mg	<1%	2mg
Potassium	249mg		151mg
Vitamin B6	0.2mg	11%	0.11mg
Folate eq	29.7ug	15%	18ug
Vitamin C	28.1mg	70%	17mg
Manganese	2.1mg	43%	1.3mg
Total polyphenols^	134mg GAE		81mg GAE
Beta-carotene eq	35ug		21ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Pineapple juice was found to decrease inflammation in the gut of mice.³ Mice consuming pineapple juice for 15 days showed the anti-depressant potential of pineapple. The mice were tested and found more active on the pineapple diet.⁴ A pineapple extract restored object recognition and enhanced cognition in mice with induced amnesia.⁵ And an extract of pineapple peel had antioxidant properties which inhibited lipid oxidation of a rat brain.⁶

Pineapples also contain the essential amino acid tryptophan⁷, which acts as a natural mood regulator. This is because tryptophan helps the body to produce enough serotonin, one of the body's key 'happy hormones'. Antioxidants like polyphenols and vitamins can interfere with inflammatory signalling cascade effect - this includes breaking down tryptophan. So reducing inflammation will make more tryptophan available for serotonin production.^{8,9}

A review of 61 studies analysing the association between fruit and vegetable intake and mental health in adults found a high total intake of fruit and vegetables may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms. The authors concluded that fruit and/or vegetables have a positive influence on mental health and the general recommendation to consume at least 5 portions of fruit and vegetables a day may be beneficial for mental health.¹⁰

A review of 17 studies found an association between higher fruit and vegetable intake and better mental health in adolescents. The components of mental health assessed included health-related quality of life, mental health status, happiness and self-esteem as well as anxiety, stress and distress and depressive symptoms. The strongest mental health benefits were found for fresh fruit.¹¹

So enjoy the sweetness of pineapple it pairs perfectly with so many other flavours: banana, basil, chili cinnamon, coconut, coriander, ginger, lime, macadamia, mango, mint, orange, raspberry, red onion, rosemary, strawberry and other tropical fruit.

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NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>
 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Pineapple and/or *Ananas comosus* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

52. PISTACHIO A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Feeling jaded? Eat green pistachios – rich in B6 for a happy mood.
- Get psyched eating pistachios – rich in biotin to feel good and function effectively.
- Green with envy? Snack on pistachios instead – contains thiamin for vitality.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie pistachios.

Pistachio:

- ✓ Packed with Vitamin B6 – mood enhancer
- ✓ Bursting with biotin – psychological wellbeing
- ✓ Source of thiamin – for vitality
- ✓ Source of niacin – anti-brain drain
- ✓ Source of vitamin E – antioxidant protection
- ✓ Source of copper – brain health
- ✓ Source of plant iron – cognition/ brain function
- ✓ Contains potassium – nervous system
- ✓ Source of fibre – digestive system
- ✓ Contain polyphenols - antioxidants

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Pistachio fun facts:

- They're known as the "smiling nut" in Iran and the "happy nut" in China – when the shell splits it smiles.
- Pistachios are related to the mango and the spice sumac.
- Cracking open pistachios and seeing the pile of shells may help you eat less.¹
- Pistachios contain resveratrol the antioxidant found in red wine.²
- Pistachios contain healthy fats for healthy hearts.³
- Pistachios have a GI lowering effect when added to meals with carbohydrates.⁴
- Royally delicious - the Queen of Sheba loved pistachios.
- You can eat the pistachio fruit – quite the delicacy.

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NUTRITION INFORMATION

Serving size: 30g (30 pistachio kernels raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	1.2g		4g
Energy	763kJ	9%	2540kJ
Protein	5.9g	12%	19.7g
Total fat	15.2g	22%	50.6g
Saturated fat	1.7g	7%	5.8g
Monounsaturated fat	8g		26.7g
Polyunsaturated fat	4.8g		16.1g
Total Carbohydrates	4.7g	2%	15.8g
Sugars	1.8g	2%	5.9g
Dietary fibre	2.7g	9%	9g
Sodium	2mg	<1%	7mg
Potassium	285mg		950mg
Thiamin	0.2mg	16%	0.6mg
Niacin eq	1.7mg	17%	5.7mg
Vitamin B6	0.5mg	28%	1.5mg
Biotin	9ug	30%	30ug
Vitamin E	1.2mg	12%	4.1mg
Copper	0.4mg	14%	1.4mg
Iron	1.2mg	10%	3.9mg
Total polyphenols^	497mg GAE		1660mg GAE
Resveratrol**	35ug		115ug
Lutein zeaxanthin^	871ug		2903ug
Anthocyanin^^	2.3mg		7.5mg
Beta-carotene eq	39ug		130ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

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NIP nutrient composition database references

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SUBSTANTIATION FOR PISTACHIO

Individual consumer friendly nutrient content and permitted general level health claims:

- Feeling jaded? Eat green pistachios the smiley nut – rich in Vitamin B6 for a happy mood. A 30g serve of pistachio kernels contains 28% of the RDI for B6. Vitamin B6 is needed for normal psychological function.
- 30:30:30 - Split open 30 pistachios for a good dose of biotin because it helps with psychological wellbeing. Pistachios are biotin-rich providing 30% of daily biotin needs in 30 kernels or 30g.
- Happy smiley pistachios are a source of thiamin for vitality. A 30g handful provides 16% of the RDI for thiamin needed for normal neurological and psychological function, and the body's energy factories.
- No more brain drain with pistachios they're necessary for niacin for psychological wellbeing, normal brain function and fighting fatigue. A 30g serve provides 16% of the RDI.
- Crack open a handful of pistachios they contain copper for brain health. There's 14% of copper's RDI in 30 kernels.
- Split open 30 pistachios for a source of plant iron. Perfect for vegetarians. A 30g serve provides 10% of the RDI for iron necessary for a healthy brain function and cognition.
- Half a cup of pistachio kernels contains 285mg potassium for a healthy nervous system.
- Pistachios and their pretty purple skins are a source of fibre for a healthy digestive system. 30 kernels contain nearly 3g of fibre.
- Pistachios are packed with antioxidants such as vitamin E and polyphenols for antioxidant cell protection.
- Pretty pistachios all purple and green contain colourful antioxidant pigments anthocyanins, lutein zeaxanthin, chlorophyll and beta-carotene.

*When eaten as part of a healthy varied diet.
(This statement needs to appear at the bottom of each commodity webpage)

NUTRITION INFORMATION

Serving size: 30g (30 pistachio kernels raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	1.2g		4g
Energy	763kJ	9%	2540kJ
Protein	5.9g	12%	19.7g
Total fat	15.2g	22%	50.6g
Saturated fat	1.7g	7%	5.8g
Monounsaturated fat	8g		26.7g
Polyunsaturated fat	4.8g		16.1g
Total Carbohydrates	4.7g	2%	15.8g
Sugars	1.8g	2%	5.9g
Dietary fibre	2.7g	9%	9g
Sodium	2mg	<1%	7mg
Potassium	285mg		950mg
Thiamin	0.2mg	16%	0.6mg
Niacin eq	1.7mg	17%	5.7mg
Vitamin B6	0.5mg	28%	1.5mg
Biotin	9ug	30%	30ug
Vitamin E	1.2mg	12%	4.1mg
Copper	0.4mg	14%	1.4mg
Iron	1.2mg	10%	3.9mg
Total polyphenols^	497mg GAE		1660mg GAE
Resveratrol**	35ug		115ug
Lutein zeaxanthin^	871ug		2903ug
Anthocyanin^^	2.3mg		7.5mg
Beta-carotene eq	39ug		130ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Subcategory NUT claim:

- Nuts: Happiness in a handful. A healthy, varied diet containing a variety of nuts such as pistachios is good for brain function and psychological wellbeing – putting you in happy mood.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Pretty pistachios add that gorgeous green tinge to so many traditional delicacies – gelato, nougat, baklava, biscotti. The gorgeous green is not just for show both green pistachio kernels and their purple coats are loaded with antioxidants and play an important antioxidant and anti-inflammatory role. Combined with their wide variety of brain-boosting nutrients pistachios are definitely one nut worth cracking open.

Pistachios' green is due to the pigments chlorophyll (green) and lutein zeaxanthin (yellow) and the purple skins are thanks to antioxidant anthocyanins. In fact the purple skins have more antioxidants than the green kernels.¹ Pistachio also contains polyphenolic compounds including flavonoids which give them their antioxidant and anti-inflammatory superpower.^{2,3}

Pistachios for brain function

A 2017 study by researchers at Loma Linda University Health found when people ate nuts on a regular basis it strengthens their brainwave frequencies associated with cognition, healing, learning, memory and other key brain functions. Pistachios, for instance, produced the greatest gamma wave response, which is critical for enhancing cognitive processing, information retention, learning, perception and rapid eye movement during sleep.⁴ Dr Lee Berk, Principal Researcher, is best known for four decades of research into the health benefits of happiness and laughter. Laughter is the best medicine as it positively affects brain chemistry helping to reduce stress.⁵ He also discovered eating dark chocolate (70% cacao) has a positive impact on cognition, memory and mood.⁶ Dark chocolate pistachios bark anyone?

The anti-inflammatory effect of pistachio consumption shows improvements in vascular function by relaxing blood vessels and improving blood flow. This has important implications not only for heart health and brain function but also blood pressure lowering. In general the research suggests that as little as 30-40g of pistachios a day has positive effects on blood vessel dilation.⁷⁻¹⁰ One research group saw no change in blood flow with pistachios¹¹ however in another study they found that pistachio intake helped the heart deal with stress better.¹²

Several animal studies have found improvements in cognition and motor deficits when the rats and mice ate pistachios - due to improving the brain's oxidative status through antioxidant compounds.^{13,14} Regular intake of pistachio has also been found to offset the damaging effects of a high fat-diet in the brain of obese mice as antioxidant- rich pistachios reduced both metabolic and cellular brain dysfunction.¹⁵

Pistachios contain fibre which has an important role not only in gut health for a regular bowel function but also impacting on the gut microbiome. A group of 16 volunteers ate around 40g or 80g of pistachios daily for 18 days, or no nuts at all, and their faeces collected and assessed for changes in gut bacteria. Pistachio consumption significantly increased in the number of beneficial butyrate-

producing bacteria and appeared to decrease the number of lactic acid bacteria compared to those that ate no nuts.¹⁶ Since gut bacteria plays a role in brain health through the production of short chain fatty acids such as butyrate, this may explain one way pistachios are good brain food.

Nuts for a good mood

Nuts in general have a positive effect on brain health and psychological wellbeing. An Australian Mediterranean diet study found those eating more nuts (and greater vegetable diversity) had greater reduction in depression and improved mental health scores which were sustained over 6 months.¹⁷ A Chinese study of some 13,600 people found those eating nuts at least one a week had an 18% reduction in depression risk compared to those eating nuts less than once a week.¹⁸ The Australian SMILES trial with 67 participants found improvements in ratings of depression after 12 weeks of a special diet which included a daily serving of nuts.¹⁹

Nuts and better cognition

Eating nuts also improves brain function and cognition – your ability to process information and experiences. A review by University of South Australia researchers, of more than 70 studies, found that a 30g handful of nuts enjoyed daily may improve mental processes such as memory, problem solving and decision making. It may be nuts' ability to reduce inflammation and improve blood flow that's key.²⁰

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SEARCH TERMS USED FOR PUBMED: Pistachio and/or *Pistacia vera* and review and diet and [mood/ psychological wellbeing/ optimism/ brain/ cognition/ stress/ vascular/anthocyanin]

53. PLUM A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Got the ho-hums? Eat more plums - with vitamin C for psychological wellbeing.
- Plums contain many antioxidants for cell protection: vitamin E and polyphenols.
- Red purple blue plums contain colourful anthocyanins for antioxidant protection.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie Plums.

Plum:

- ✓ Source of vitamin C – psychological wellbeing
- ✓ Source of antioxidant vitamin E – free radical fighter
- ✓ Source of niacin – energiser
- ✓ Contains potassium – nerve function
- ✓ Contains polyphenol antioxidants
- ✓ Contains anthocyanins – red purple coloured antioxidant
- ✓ Contains beta-carotene –orange coloured antioxidant
- ✓ Source of fibre – gut health
- ✓ Contains natural fruit sugars – body fuel
- ✓ Contains low Glycemic Index carbs – sustained energy

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Plum fun facts:

- Plum is a member of the *Prunus* stone fruit family along with peach, nectarine, apricot.
- 12 varieties of plums are grown in Australia.
- Plum season is from December to April.
- A dried plum is a prune.
- Plum skin can be bluish-black, red, purple, green or yellow.
- Plum flesh can be golden to light red to dark red.
- Plum flavour can be sweet to tart.

References for website:

- 1 www.summerfruit.com.au

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

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**Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

NUTRITION INFORMATION

Serving size: 150g (2 small plums raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	132g		88g
Energy	243kJ	3%	162kJ
Protein	0.9g	2%	0.6g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	10.7g	3%	7.1g
Sugars	9.8g	11%	6.5g
Dietary fibre	3g	10%	2g
Sodium	3mg	<1%	2mg
Potassium	230mg		153mg
Niacin eq	1.1mg	11%	0.7mg
Vitamin C	7.5mg	19%	5mg
Vitamin E	1.2mg	12%	0.8mg
Total polyphenols^	498mg GAE		332mg GAE
Beta-carotene eq	224ug		149ug
Anthocyanins^^	108mg		72mg
Glycemic Index (GI) **	39 (low)		

Source: Aust Food Comp Data or ^ USDA

^^ Wu et al

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

SUBSTANTIATION FOR PLUM

Individual consumer friendly nutrient content and permitted general level health claims:

- Got the ho-hums? Eat more plums. Two small plums contains nearly 20% of the RDI for vitamin C - for psychological wellbeing and brain function.
- A 150g serve (2 small plums) contains 12% of RDI for antioxidant vitamin E – protecting cells from free radical damage.
- Two small plums provides 11% of the RDI for niacin the energiser – helps produce energy, combating fatigue.
- Like all fruit plums contain potassium – 230mg in a 150g serve – necessary for normal nerve function.
- Two small plums provide nearly 500mg of polyphenol antioxidants – for body cell protection.
- Red purple blue plums contain colourful anthocyanins - for antioxidant protection – 108mg in a 150g serve.
- They may not be orange in colour but plums do contain the orange pigment beta-carotene (224ug in a serve) - an antioxidant for cell protection.
- Keep your tum in tip top shape with plums. Two small plums contain 3g of fibre for good gut health.
- Recover from the footy scrum with a plum – replace your fuel with natural fruit sugars – 10g in two plums
- Needs long lasting energy eat plums they contain low GI carbs (GI=39).

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

NUTRITION INFORMATION

Serving size: 150g (2 small plums raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	132g		88g
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Beta-carotene eq	224ug		149ug
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Glycemic Index (GI) **	39 (low)		

Source: Aust Food Comp Data or ^ USDA

^^ Wu et al

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as plums is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Plums are another member of the delicious summerfruit family along with peach, nectarine and apricot. With their range of skin colours (yellows to reds to dark blueish blacks) and flesh colours (yellows, oranges and reds) these colours signal antioxidant pigments in plums with a range of brain health benefits.

Plum and plum products have a cognitive improvement effect. Animal studies have shown the high polyphenol antioxidant content of plum is responsible for the benefits of cognition (learning and spatial memory). Chlorogenic acid in plum also appeared to reduce anxiety in an animal study.¹ Plums contain some 49 different antioxidant compounds.² The effects of these antioxidants have been studied in young, middle-aged and elderly adults. After consumption of 195g of plum twice a day for 5 days, there was a significant increase in urinary 6-sulfatoxymelatonin (an antioxidant) and in total antioxidant capacity levels.³

Similarly a study found following consumption of Queen Garnet plum juice, there was:

- A threefold increase in hippuric acid excretion (a potential biomarker for total polyphenols intake),
- An increase in urinary antioxidant capacity and
- A reduction in malondialdehyde excretion - a biomarker for oxidative stress.⁴

Antioxidants in general are able to protect body cells from free radical damage and oxidative stress and this is particularly important for brain cells and a healthy functioning brain.⁵

Plums are so easily recognised because of the rich dark colours of their skins. From bright red, to dark maroon to blueish black – plum colours signal the presence of antioxidant pigments. The most common is anthocyanins.⁶

The Queensland Government bred a new variety of plum over a decade ago - Queen Garnet Plum with unusual purple flesh. They have been found to have five times more anthocyanins than regular plums. They also have an anti-inflammatory action.^{7,8}

Anthocyanins are potent antioxidants and there is considerable evidence of the effect of oxidative stress in neurodegenerative diseases. A defective antioxidant defence system can lead to free radicals causing inflammation, cell death, and tissue damage. Anthocyanins may regulate the free radical interference that generates amyloid peptides (beta-amyloids) that may cause Alzheimer's Disease.^{9,10}

The bright colours inside a plum indicate the presence of the orange coloured pigment beta-carotene another important antioxidant. If the recommendations are to eat fruits and vegetables from all the colours of the rainbow, to get a wide range of phytochemicals, then plums tick a few colour boxes.

Fruit in general promotes a more positive outlook regardless of age.

Young ones need plums

The Australian Victorian Child's Health and Wellbeing study of 3,370 children found kids who ate more serves of fruit each day had significantly better odds of emotional control, problem management and relationship building skills (pro-social behaviour).¹¹

A randomised controlled trial of young adults who don't eat much fruit and vegetable found that providing them with 2 additional daily servings of fruit and vegetables significantly improved psychological wellbeing (e.g., feelings of vitality, flourishing, and motivation).¹²

Wise ones need plums too

A cross-sectional, prospective Australian study of over 60,000 adults (greater than 45 years in age), found increasing fruit and vegetable consumption may help reduce psychological distress in middle-aged and older adults.¹³ A recent study involving a nationally representative sample of 12,385 Australian adults surveyed over several years reported that combined fruit and vegetable consumption was predictive of increased happiness, life satisfaction and wellbeing.¹⁴

A systematic review of 61 studies assessing fruit and vegetables consumption in adults found a high total intake of fruit and vegetables may promote higher levels of optimism and self-efficacy, as well as reduce levels of psychological distress.¹⁵

So when summer comes around get stuck into the delicious fruity flavours of feel good plums.

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<https://pubmed.ncbi.nlm.nih.gov/16719536/>

**Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SEARCH TERMS USED FOR PUBMED: Plum and/or <i>Prunus domestica</i> and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition]

54. POTATO A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Feeling low? Eat a potato. This humble veg will lift you up in both mind and body with its helpful vitamin C.
- Potatoes are nature's comfort food. They're rich in the B-vitamin niacin to keep you in your happy place.
- Don't be a couch potato! Potatoes contain vitamin B6 to beat tiredness and help you power through your day.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie potatoes.

Potato:

- ✓ Rich in vitamin C – psychological wellbeing
- ✓ Rich in niacin – mood booster
- ✓ Source of vitamin B6 – beat tiredness
- ✓ Source of folate – fatigue fighter
- ✓ Source of magnesium – energy metabolism
- ✓ Source of thiamin – energy levels
- ✓ Source of fibre – happy gut
- ✓ Contains potassium – steady nerves
- ✓ Contains polyphenols – antioxidant protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Potato fun facts:

- There are 5000 known potato varieties and they come in different colours: brown, yellow, red, pink and purple.
- Potatoes were first grown in Australia with European colonisation in 1788 and are now the second most commonly consumed vegetable in Australia.¹
- It's a good idea to eat potato with the skin for the fibre and antioxidants it contains.²
- Did you know that cooked and cooled potato (such as in potato salad) contains resistant starch that supports a healthy gut microbiome?³
- Potatoes are more filling and satisfying than other starchy foods such as rice or pasta.⁴
- Potatoes varieties are generally waxy, starchy or all-purpose.
 - Waxy spuds (Kipfler, Nicola, Dutch creams, Bintje) hold their shape and good for boiling, roasting or salads.
 - Starchy spuds (e.g. Coliban, King Edward) are perfect for mash, and
 - All-purpose spuds (e.g. Kennebec, Sebago, Desiree) are all-rounders you can cook in any way you like.⁵

NUTRITION INFORMATION

Serving size: 150g (1 medium potato peeled, baked)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	108g		72g
Energy	552kJ	6%	368kJ
Protein	4.5g	9%	3g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	26.1g	8%	17.4g
Sugars	2.3g	3%	1.5g
Dietary fibre	2.6g	9%	1.7g
Dietary fibre^ (with skin)	3.3g	11%	2.2g
Sodium	10.5mg	<1%	7mg
Potassium	864mg		576mg
Thiamin	0.1mg	12%	0.09mg
Niacin eq	3.4mg	34%	2.3mg
Vitamin B6	0.2mg	15%	0.2mg
Folate eq	28.5ug	14%	19ug
Vitamin C	28.5mg	71%	19mg
Magnesium	43.5mg	14%	29mg
Total polyphenols^	204mg GAE		136mg GAE

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR POTATO

Individual consumer friendly nutrient content and permitted general level health claims:

- Vitamin C is for more than just immune function, it is also needed for psychological wellbeing. One medium baked potato contains 71% of the recommended daily amount of vitamin C. Avoid boiling potatoes otherwise you'll lose water-soluble vitamin C to the cooking water. Unless it's a soup or stew.
- One baked potato provides 34% of the recommended daily amount of niacin. This B-vitamin contributes to psychological wellbeing.
- Vitamin B6 helps you out with energy for living. It helps beat tiredness and fatigue by activating energy metabolism. One baked potato contains 15% of the recommended daily amount of B6.
- Folate is a B-vitamin that helps fight fatigue. One baked potato provides 14% of folate needs.
- One medium baked potato provides 14% of the RDI for magnesium. This mineral is important for normal energy metabolism.
- One potato provides 12% of the daily recommended amount of thiamin, important for optimal energy levels.
- A 150g serve of potato provides nearly 3g of fibre for a healthy gut.
- Potassium helps the nervous system function and one medium baked potato contains 864mg potassium.
- Even though they are white, potatoes also contain 200mg of polyphenol antioxidants. Not all antioxidant compounds in vegetables are brightly coloured.

NUTRITION INFORMATION

Serving size: 150g (1 medium potato peeled, baked)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	108g		72g
Energy	552kJ	6%	368kJ
Protein	4.5g	9%	3g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	26.1g	8%	17.4g
Sugars	2.3g	3%	1.5g
Dietary fibre	2.6g	9%	1.7g
Dietary fibre^ (with skin)	3.3g	11%	2.2g
Sodium	10.5mg	<1%	7mg
Potassium	864mg		576mg
Thiamin	0.1mg	12%	0.09mg
Niacin eq	3.4mg	34%	2.3mg
Vitamin B6	0.2mg	15%	0.2mg
Folate eq	28.5ug	14%	19ug
Vitamin C	28.5mg	71%	19mg
Magnesium	43.5mg	14%	29mg
Total polyphenols^	204mg GAE		136mg GAE

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as potato, as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLES claim:

- A healthy, varied diet with a variety of vegetables such as potato is good for brightening your mood, brain function, psychological wellbeing and happiness.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

There's more goodness inside the humble spud than meets the (potato) eye.

Interesting compounds in potatoes***Antioxidants***

Diet can affect mental health and mood in a number of ways, including by reducing inflammation and counteracting oxidative stress. The brain is considered highly susceptible to oxidative stress, or the imbalance between the production of pro-oxidative reactive molecules and counteracting antioxidants. This 'redox imbalance' is implicated in psychological disorders such as depression, anxiety and emotional stress as well as degenerative brain diseases.¹

Potatoes may not contain the highest concentration of antioxidants in the vegetable world, but we eat a lot of them so they are a valuable source of dietary antioxidants including ascorbic acid (vitamin C), but also loads of polyphenols such as; chlorogenic acid, gallic acid, protocatechuic acid and caffeic acid.²

A study using an anthocyanin-rich purple potato variety found eating 200g a day for two weeks reduced blood vessel stiffness, which improves blood flow and reduces cardiovascular risk (heart and brain). Anthocyanins do this by reducing inflammation and protecting blood vessel walls against oxidative stress.²

Although yellow- and white-fleshed potatoes are the most common, there are approximately 5000 known varieties with different colours and combinations for flesh and skin colour. The darker the colour, the higher the antioxidant activity, and this activity is highest in coloured skin. Red- and blue/purple-fleshed potatoes are particularly rich in phenolic compounds. These colours contain about three times higher amounts of total polyphenols than traditional yellow-fleshed varieties, as well as two to three times higher antioxidant activity.⁴

Potatoes provide 25% of vegetable polyphenols in the American diet, the largest contributors among the 27 vegetables commonly consumed in the United States, including flavonoids (quercetin and kaempferol), phenolic acids (chlorogenic acid and caffeic acid).³ Since we consume a similar Western-type diet, it could be assumed potatoes also contribute significant amounts of polyphenols to the Australian diet as well.

Potatoes are a valuable source of antioxidants. To get the most antioxidants out of your potato, eat the skin.

Fibre for gut health and mood

Potatoes contain dietary fibre needed for a healthy gut, and cooked and cooled potato contains a particular kind of fibre called resistant starch that is beneficial to the gut microbiome.⁵ Dietary fibre enhances and optimises the population of gut bacteria and this can improve psychological wellbeing. Short chain fatty acids (SCFAs) such as butyrate and propionate are produced by gut bacteria when they ferment fibre and resistant starch in the large intestine. These SCFAs reduce brain inflammation, which keeps brain cells healthy and preserves normal brain function and behaviour.⁶

Fruit and vegetables, mental health, psychological wellbeing and mood

There is now good evidence that higher fruit and vegetable intake is related to better mental health. People who eat more fruit and vegetables have a lower incidence of mental disorders, including lower rates of depression, perceived stress, and negative mood. And they also have a higher likelihood of optimal mental states, such as greater happiness, positive mood, life satisfaction and socio-emotional “flourishing” - feelings of meaning, purpose, and fulfilment in life.⁷

High-quality diets regardless of type (healthy, prudent, Mediterranean) are linked with a lower risk of depressive symptoms. In a review of 24 studies, people consuming higher amounts of vegetables had an 18% lower risk of experiencing depressive symptoms, and those with a low dietary inflammatory index had a 19% lower risk.⁸

For older people higher, long-term vegetable intake over five years has been linked with better cognition and better information processing speeds. In particular, root vegetables (such as potatoes) were associated with better cognitive function.⁹

So there’s no reason to skip spuds and good reasons to eat more of them.

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Potato and/or *solanum tuberosum* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/fibre/resistant starch/antioxidants]

55. PRUNE A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Feeling crappy – eat prunes be happy with antioxidants for brain health.
- Feeling slow - eat low GI prunes for an energy boost.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie prunes.

Prune:

- ✓ Contains low GI carbs (GI=29) – sustained energy
- ✓ Contains natural fruit sugars – for energy
- ✓ Source of fibre – gut health
- ✓ Contains potassium – nerve function
- ✓ Contains polyphenols – antioxidant protection
- ✓ Contains colourful carotenoids – antioxidant defence

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Prune fun facts:

- “Prune” is the French word for “plum” and dried plums are “pruneaux” (pronounced “pruno”).
- Prunes are dried French d’Agen plum variety.
- d’Agen prunes have a higher sugar content and waxy thicker skins to allow water to move out and they can dry without fermenting.
- Store prunes in their original zip lock bag (or in an air tight container if the bag has no zip, in the fridge to keep them moist and juicy.
- Prune flavours and aromas are due fruit acids and volatile compounds produced from the caramelisation of sugars during drying, and released during chewing.¹
- Prunes’ purple/black colours are from colourful carotenoids (beta-carotene, lutein and zeaxanthin) as well as degradation of the red/purple pigment anthocyanin during drying.²
- Prunes for bones: research shows prunes can promote bone formation due to a number of bone building nutrients e.g. vitamin K, potassium, boron and sorbitol.^{3,4}
- Prunes for bowels: prunes contain fibre, sorbitol and antioxidant chlorogenic acid which all work together for gut health to keep you regular.³
- Prunes are delicious, versatile, healthy & nutritious!

NUTRITION INFORMATION

Serving size: 50g (6 prunes)
(industry derived)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	19g		37g
Energy	421kJ	5%	841kJ
Protein	1.2g	2%	2.3g
Total fat	0.2g	<1%	0.4g
Saturated fat	0g	0%	0g
Total Carbohydrates	22g	7%	43.9g
Sugars	15.5g	17%	31g
Dietary fibre	3.9g	13%	7.8g
Sodium	3.5mg	<1%	7mg
Potassium	350mg		700mg
Total polyphenols^	470mg GAE		938mg GAE
Beta-carotene eq	218ug		435ug
Lutein Zeaxanthin	74ug		148ug
Glycemic Index (GI) ^^	29		
Sorbitol			11.4g
Vitamin K^	29.8ug	43%	59.5ug
Boron^^^	0.23mg		0.45mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

References for website:

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

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SUBSTANTIATION FOR PRUNE

Individual consumer friendly nutrient content and permitted general level health claims:

- Feeling crappy – eat prunes be happy. Antioxidants in prunes protect brain cells from free radical damage.
- Feeling slow - eat low GI prunes for an energy boost that lasts longer (GI=29).
- Go plum crazy for prunes! Six prunes provide nearly 4g of fibre for a healthy, regular gut function.
- A 50g serve of prunes contains 350mg potassium a necessary electrolyte for normal nervous system function.
- Prunes contain 470mg polyphenols for antioxidant defence.
- Prunes' purple-black colour is due to a mix of antioxidants pigments - carotenoids (orange beta carotene, yellow lutein and zeaxanthin) and flavonoids (red/purple anthocyanins that have darkened on drying).

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory FRUIT claim:

- A healthy varied diet high in fruit such as prunes is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 50g (6 prunes)
(industry derived)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	19g		37g
Energy	421kJ	5%	841kJ
Protein	1.2g	2%	2.3g
Total fat	0.2g	<1%	0.4g
Saturated fat	0g	0%	0g
Total Carbohydrates	22g	7%	43.9g
Sugars	15.5g	17%	31g
Dietary fibre	3.9g	13%	7.8g
Sodium	3.5mg	<1%	7mg
Potassium	350mg		700mg
Total polyphenols^	470mg GAE		938mg GAE
Beta-carotene eq	218ug		435ug
Lutein Zeaxanthin	74ug		148ug
Glycemic Index (GI) ^^	29		
Sorbitol			11.4g
Vitamin K^	29.8ug	43%	59.5ug
Boron^^^	0.23mg		0.45mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Recently new research found prunes can positively affect bone. Prunes contain lesser known bone-building nutrients – vitamin K, potassium, boron, sorbitol and polyphenols. They work together to improve bone mineral density by reducing markers of bone resorption while promoting markers of bone formation.¹

As new research continues to surface, the health benefits of prunes continues to expand. This time an exciting new role in protecting brain function thanks to prunes' fibre and antioxidants.

We all know prunes have a laxative effect – keeping bowel motions regular. Prunes are high in fibre – nearly 4g per 50g serve. Fibre plays an important role as a prebiotic (food) for probiotics (gut bacteria). Diets high in fibre can improve gut bacteria to positively affect psychological wellbeing. It does this because bacteria ferment fibre in the large intestine generating short chain fatty acids (SCFA) such as butyrate and propionate. These SCFAs have anti-inflammatory effects which help protect brain structure, function and behaviour and help overall brain maintenance.²

Plums have antioxidant properties and plum consumption is associated with improved cognitive function.³ For instance the most abundant antioxidant in prunes (dried plums) is chlorogenic acid⁴ with 22mg/50g serve⁵. Preliminary research has found chlorogenic acid induces a decrease in anxiety-related behaviours in an animal model. Chlorogenic acid can reduce oxidative stress and hence may influence brain function.⁶

Although not all studies found the same results. Rats drinking plum juice had improved working memory, whereas rats fed dried plum powder saw no change. The researchers thought this may be due to the smaller quantity of phenolic antioxidants consumed in the powder group compared with the juice group.⁷

Prunes also contain colourful carotenoid pigments beta-carotene and lutein zeaxanthin. Carotenoids protect against age-related diseases (such as cognitive decline) by acting as antioxidants and counteracting oxidative stress through neutralising free radicals. Beta-carotene also helps control chronic inflammation which can lead to chronic disease.^{8,9} Quality of life and mental health have improved in people eating more fruit and vegetables and consuming more beta-carotene.¹⁰

Another interesting compound in prunes is melanoidin which is generated via the plum/prune drying process. Melanoidins contribute to prunes' antioxidant protection against oxidative stress.¹¹

Fruit and vegetables, in general are considered essential for a healthy brain function to protect cognition and bolster mood. A systematic review of 61 studies considered a number of mood characteristics ranging from general and mental wellbeing, quality of life, sleep quality, life satisfaction, flourishing, mood, self-efficacy, curiosity, creativity, optimism, self-esteem, stress, nervousness, or happiness, to anxiety and distress. The results indicated that high total intake of fruit and vegetables, may promote higher levels of optimism and self-efficacy, as well as reduce levels of psychological distress.⁸

A recent study involving a nationally representative sample of 12,385 Australian adults surveyed over several years reported that combined fruit and vegetable consumption was predictive of increased happiness, life satisfaction and wellbeing, with improvements observed within 2years.⁹

And for fruit specifically eating fruit as a snack (let's say 6 prunes) compared to an unhealthy snack such as chocolate or crisps, was found to be associated with lower anxiety and emotional distress.¹⁰

These benefits have been identified in both adults and children with evidence suggesting that increased fruit intake may improve psychological wellbeing.^{2,12} The Australian Victorian Child's Health and Wellbeing study (3370 children) observed that children with a higher number of daily fruit servings had significantly better odds of emotional control, problem management and relationship building skills (pro-social behaviour).¹²

Some think prunes are an old person's fruit but it's high time to reacquaint yourself with the sweet taste and juicy plumpness of prunes - you'll be pleasantly surprised. Enjoy 50grams or about 6 pitted prunes a day either as a snack or as a versatile ingredient in meals. Delicious, healthy, nutritious prunes are perfect for the entire family. They're an affordable dried fruit and available year round.

Here's a few ideas to get you started....

Prunes have rich flavour, lots of sweetness with a little acidity but in a mellow way that works well with both sweet and savoury foods. Prune puree is a great sugar substitute for cakes, muffins, brownies and smoothies. Prunes work well in marinades, chutneys and sauces. Combine them with cheese, meats or nuts. And then there is the classic 1970's hors d'oeuvre Devils on horseback - prunes wrapped in bacon or prosciutto. For a fun twist add a brazil nut in the centre of the prune. Delish!

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

^^^Naghii MR, Lyons Wall PM, Samman S. The boron content of selected foods and the estimation of its daily intake among free living subjects. *J Am Coll Nutr* 1996;15:614-9. https://www.researchgate.net/publication/14255184_The_boron_content_of_selected_foods_and_the_estimation_of_its_daily_intake_among_free-living_subjects

SEARCH TERMS USED FOR PUBMED: Prunes and/or *Prunus domestica* D'Agen and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

56. PUMPKIN A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- You won't feel like slumping when eating pumpkin. With vitamin C for mood-boosting effects.
- Pumpkin will get you out of a bad patch. With vitamin C for mood-boosting effects.
- Pumpkin will keep you jumping. With folate for fatigue reduction.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie pumpkin.

Pumpkin:

- ✓ Rich in vitamin C – mood booster
- ✓ Source of folate – fatigue fighter
- ✓ Contains potassium – steady nerves
- ✓ Contains beta-carotene – antioxidant protection
- ✓ Contains polyphenols – antioxidant protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Pumpkin fun facts:

- Pumpkins are a member of the gourd family, which includes cucumbers, melons and zucchini.
- Whole pumpkins keep very well for weeks or even months in an airy spot. Cut pumpkin should be used within a couple of days as it is susceptible to mould unless kept in the fridge.
- Did you know pumpkin flowers are edible, as is the skin and the seeds too? No wastage - all parts of the pumpkin can be used.
- Pumpkin absorbs a lot of water so best to cook it via steaming or baking rather than boiling, to avoid it turning to mush.
- Beta-carotene is a powerful antioxidant that gives pumpkin its vibrant colour. The body converts beta-carotene into vitamin A, an essential nutrient for good eye health.^{1,2}

NUTRITION INFORMATION

Serving size: 75g (1/2 cup baked)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	65g		86g
Energy	140kJ	2%	186kJ
Protein	1.5g	3%	2.0g
Total fat	0.3g	<1%	0.4g
Saturated fat	0g	0%	0g
Total Carbohydrates	5.4g	2%	7.2g
Sugars	3.8g	4%	5.0g
Sodium	0.8mg	<1%	1.0mg
Potassium	252mg		336mg
Folate eq	20.3ug	10%	27ug
Vitamin C	10.5mg	26%	14.0mg
Total polyphenols^	118mg GAE		157mg GAE
Beta-carotene eq	1950ug		2600ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

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NIP nutrient composition database references

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR PUMPKIN

Individual consumer friendly nutrient content and permitted general level health claims:

- No more slump'in with pumpkin. This favourite orange Aussie vegetable will help to boost your mood. Half a cup of cooked pumpkin contains 26% of your daily vitamin C needs. Vitamin C contributes to psychological function.
- Let pumpkin get you out of the bad patch. Half a cup cooked contains 20ug of folate, which is 10% of your daily needs. Folate reduces tiredness and fatigue.
- Pumpkin is packed with beta-carotene. An antioxidant that is responsible for the deep orange colour and also protects body cells. One cooked serve provides 1974ug.
- One 75g serve of baked pumpkin contains 118mg of polyphenol antioxidants to help fight free radical damage.
- Enjoy a ½ cup serve of cooked pumpkin for steady nerves thanks to 252mg of potassium.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as pumpkin, as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables, such as pumpkin, is good for brightening your mood, brain function, psychological wellbeing and happiness.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

There's nothing better than baked pumpkin with nutmeg as part of a roast dinner. A comforting family favourite in winter. Pumpkin also contains a number of nutrients that support positive mood and psychological wellbeing.

Pumpkin contains antioxidants vitamin C, polyphenols and carotenoids such as beta-carotene. Carotenoids protect against age-related diseases by providing antioxidant defence of cells and controlling systemic inflammation (general inflammation that occurs throughout the body).¹ Higher intakes of these nutrients is associated with better cognitive function in older people and the association is stronger for food sources than supplements.²

Pumpkin's orange colour is thanks to beta-carotene which has been linked to higher levels of optimism.³ A study in middle aged women found those who ate higher amounts of both alpha- and beta-carotene were less likely to report symptoms of depression.⁴

NUTRITION INFORMATION

Serving size: 75g (1/2 cup baked)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	65g		86g
Energy	140kJ	2%	186kJ
Protein	1.5g	3%	2.0g
Total fat	0.3g	<1%	0.4g
Saturated fat	0g	0%	0g
Total Carbohydrates	5.4g	2%	7.2g
Sugars	3.8g	4%	5.0g
Sodium	0.8mg	<1%	1.0mg
Potassium	252mg		336mg
Folate eq	20.3ug	10%	27ug
Vitamin C	10.5mg	26%	14.0mg
Total polyphenols^	118mg GAE		157mg GAE
Beta-carotene eq	1950ug		2600ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE Gallic Acid Equivalents

The brain is considered highly susceptible to oxidative stress, or the imbalance between the production of pro-oxidative reactive molecules and counteracting antioxidants. This 'redox imbalance' is implicated in psychological disorders such as depression, anxiety and emotional stress as well as degenerative brain diseases.⁵

We also know that eating more vegetables such as pumpkin is beneficial for a positive outlook, as a systematic review of 61 studies that considered a number of mood characteristics ranging from general and mental wellbeing, to creativity, optimism and self-esteem, found that high total intake of fruit and vegetables promoted higher levels of optimism and self-efficacy, as well as reduce levels of psychological distress.⁶

Eating vegetables and fruit is important at any age. A large Australian study of over 60,000 adults over 45 years of age that found regularly eating vegetables and fruit may help reduce psychological distress in middle and older age.⁷ Another study found giving young adults who didn't eat fruit and veg an extra two servings of fruit and vegetables a day significantly improved their feelings of vitality, flourishing, and motivation.⁸ An Australian study surveying 12,385 Aussie adults over several years also found that consistent fruit and vegetable consumption was predictive of increased happiness, life satisfaction and wellbeing.⁹

So don't just wait for Halloween to enjoy all parts of the amazing pumpkin. Whether it's the vibrant orange flesh, the edible skin or the crunchy seeds, this vegetable packs a nutrition punch and will help to boost your mood.

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 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Pumpkin and *Cucurbita spp.* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

57. RAISIN A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Raisin' the stakes – raisins an antioxidant polyphenol powerhouse.
- Raisin' spirits – raisins contain energising fruit sugars.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie Raisins.

Raisin:

- ✓ Contains polyphenols – antioxidant defence
- ✓ Contains natural fruit sugars – for energy
- ✓ Contains potassium – steady nerves

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Raisin fun facts:

- “Raisin” is from the Latin word *racemus* which means a cluster of grapes or berries.
- In Australia, UK, NZ “raisin” is a dark dried large grape, “sultana” is a golden-coloured dried grape, and “currant” is a dried small Black Corinth seedless grape.
- Early Greeks and Romans awarded raisins as prizes in sporting events.
- Historically dried raisins were an important food source for army soldiers and adventurers just as they are today for bushwalkers. Naturally stable they resist spoilage due to their low moisture.
- To make 450g (1 lb) of raisins, over 1.8kg (4 lb) of fresh grapes are required.
- They may be sticky but raisins do not stick to teeth for long nor cause dental caries in fact the high antioxidant content is thought to be protective as it inhibits the bacteria that causes dental caries.¹⁻⁶
- Raisins are a prebiotic (food) for probiotics (gut bacteria) and can affected the growth of certain types of good bacteria.^{7,8}
- Raisins are a good cost effective carbohydrate source for fuelling prior to sport.^{9,10}

NUTRITION INFORMATION

Serving size: 30g (1.5tb)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	6.3g		21g
Energy	363kJ	4%	1210kJ
Protein	1g	2%	3.3g
Total fat	0.2g	<1%	0.5g
Saturated fat	0.1g	<1%	0.2g
Total Carbohydrates	20.6g	7%	68.7g
Sugars	20.1g	22%	68.7g
Sodium	3mg	<1%	10mg
Potassium	204mg		680mg
Total polyphenols^	320mg GAE		1070mg GAE
Beta-carotene eq	9ug		30ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

References for website:

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 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR RAISIN

Individual consumer friendly nutrient content and permitted general level health claims:

- Raisin' the stakes – raisins contain antioxidant polyphenols. 1.5 tablespoons of raisins contains 320mg of polyphenols needed for antioxidant defence of body cells.
- Raisin' spirits – a 30g serve of raisins contains 20g of energising fruit sugars – a natural fuel source to keep your spirits and energy levels up.
- A 30g handful of raisins contain 200mg potassium needed for a healthy nervous system.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as raisins, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as raisins is good for mental wellbeing and happiness.

- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 30g (1.5tb)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	6.3g		21g
Energy	363kJ	4%	1210kJ
Protein	1g	2%	3.3g
Total fat	0.2g	<1%	0.5g
Saturated fat	0.1g	<1%	0.2g
Total Carbohydrates	20.6g	7%	68.7g
Sugars	20.1g	22%	68.7g
Sodium	3mg	<1%	10mg
Potassium	204mg		680mg
Total polyphenols^	320mg GAE		1070mg GAE
Beta-carotene eq	9ug		30ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Raisins have been eaten by people for thousands of years as drying grapes was an easy way to preserve the fruit. They may not have known why but traditional Persian medicine included raisins in a diet to help treat Alzheimer's Disease.¹ Raisins contain polyphenol antioxidants and while the research is in its infancy it appears the polyphenol antioxidants in grape products may just help preserve brain function in animal models of depression and Alzheimer's Disease.

Grape derived polyphenols like those in raisins appear to normalise raised levels of pro-inflammatory cytokines and abnormal levels of brain derived neurotrophic factor. This helps restore impaired synaptic nerve cells that lead to depressive behaviour in animal models of stress.² Similarly they may also effectively improve the learning and memory abilities of rats with Alzheimer's Disease.³ Raisins have also been found to significantly raise blood antioxidant levels and promotes cognitive and motor performance in aging rats.⁴

Raisins reduce inflammatory markers in us humans too. Thirty-four men and postmenopausal women were randomly assigned to consume 1 cup raisins a day for 6 weeks and found the raisins decreased TNF- α - an inflammatory cytokines.⁵ Inflammatory plays a role in brain function decline.

Raisins are a convenient lunch box or desk drawer snack. Eating fruit as a snack compared to unhealthy snacks such as chocolate or crisps, was associated with lower anxiety and emotional distress in a study of 100 students.⁶ In both adults and children increased fruit intake may improve psychological wellbeing.^{7,8} The Australian Victorian Child's Health and Wellbeing study (3,370 children) observed that children with a higher number of daily fruit servings had significantly better odds of emotional control, problem management and relationship building skills (pro-social behaviour).⁷

Grapes and raisins are a feature of the Mediterranean diet and a recent systematic literature review of 29 studies found polyphenols found in Mediterranean diet foods: tea, coffee, citrus, nuts, soy, grapes, legumes, and spices; were linked with a reduced risk of depression. Polyphenols appear to effectively alleviate depressive symptoms.⁹

Raisins were once a popular snacking choice, but it seems they have been forgotten and overthrown by other unhealthy choices. It's time we raised our spirits once more by snacking on raisins.

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 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Raisin and/or *Vitis vinifera* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]



58. RASPBERRY A GOOD MOOD FOOD

WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Bubbly bliss – raspberries are bursting with vitamin C for an uplifting good mood.
- Tickled pink – raspberries help you feel flush due to folate.
- Berry good biotin – raspberries contain biotin need for psychological wellbeing.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie raspberries.

Raspberry:

- ✓ Bursting with vitamin C – energising mood enhancer
- ✓ Packed with gut-loving fibre
- ✓ Source of folate – – boosting brain function
- ✓ Source of biotin – psychological wellbeing
- ✓ Source of manganese – energy production
- ✓ Contains potassium – nerve communicator
- ✓ Contains natural fruit sugars – for energy
- ✓ Contains anthocyanins – red purple pigment antioxidant
- ✓ Contains polyphenols – antioxidant protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Raspberry fun facts:

- There are over 200 varieties of raspberries: red, purple, gold or black in colour.
- A *raspberry* is made up of many tiny bead-like fruits called “drupelets” clustered around a centre core. Each drupelet contains one seed. It’s a mega berry.
- Raspberries are crossed with other berries to make new berries:
 - Raspberries + Blackberries = Loganberries
 - Red Raspberries + Blackberries + Loganberries = Boysenberries.
- An average raspberry has 100 to 120 seeds.
- This goes with that – raspberry flavours pair well with chocolate, cheese, nuts, mint, basil and vanilla.
- Once picked there is no further ripening – once in the punnet they’re ready to eat.
- Avoid the mush – don’t wash before you store, wash before you eat.
- Australian raspberries are available at any time of the year, although they are most abundant from late spring until late autumn.
- Adding 125-250g of frozen raspberries to a breakfast meal helps control blood glucose and insulin in those with prediabetes.¹ It seems the antioxidant in raspberries affect the enzymes that breakdown carbohydrates.²

NUTRITION INFORMATION

Serving size: 125g (1 punnet raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	108g		86g
Energy	254kJ	3%	203kJ
Protein	1.4g	3%	1.1g
Total fat	0.3g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	8.5g	3%	6.8g
Sugars	8.1g	9%	6.5g
Dietary fibre	7.0g	23%	5.6g
Sodium	1mg	<1%	1mg
Folate eq	43ug	21%	34ug
Biotin	6.5ug	22%	5.2ug
Vitamin C	36.3mg	91%	29mg
Manganese	0.6mg	13%	0.5mg
Total polyphenols^	518mg GAE		414mg GAE
Beta-carotene eq	35ug		28ug
Anthocyanins^^	488mg		390mg

Source: Aust Food Comp Data or ^ USDA

^^Wu et al

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

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FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem*. 2006;54(11):4069-4075. doi:10.1021/jf060300I <https://pubmed.ncbi.nlm.nih.gov/16719536/>

SUBSTANTIATION FOR RASPBERRY

Individual consumer friendly nutrient content and permitted general level health claims:

- Bubbly bliss – raspberries are bursting with vitamin C for an uplifting good mood. One punnet provides 90% of daily vitamin C needs. Vitamin C contributes to psychological wellbeing.
- Tickled pink – raspberries help you feel flush due to folate – a nutrient needed for psychological wellbeing and healthy brain function. With one punnet providing 43ug or about 20% of daily needs.
- Berry good biotin. A punnet of raspberries contains about 7ug of biotin (22% RDI). Biotin contributes to psychological wellbeing.
- Raspberries are packed with fibre due to all the tiny seeds contained in each bubble. A punnet of raspberries contains 7g of gut-loving fibre.
- Manganese helps the body produce energy. A punnet of rascally raspberries provides 13% of the RDI for manganese.
- A 125g serve of raspberries contain 8g natural fruit sugars - fuel for the body.
- Raspberry red is due to anthocyanins – red purple pigment antioxidant. A punnet provides around 490mg.
- Raspberries contain antioxidants including polyphenols which contribute to the body's antioxidant protection. A punnet provides just over 500mg.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory FRUIT claim:

- A healthy varied diet high in fruit, such as raspberries, is good for mental wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 125g (1 punnet raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	108g		86g
Energy	254kJ	3%	203kJ
Protein	1.4g	3%	1.1g
Total fat	0.3g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	8.5g	3%	6.8g
Sugars	8.1g	9%	6.5g
Dietary fibre	7.0g	23%	5.6g
Sodium	1mg	<1%	1mg
Folate eq	43ug	21%	34ug
Biotin	6.5ug	22%	5.2ug
Vitamin C	36.3mg	91%	29mg
Manganese	0.6mg	13%	0.5mg
Total polyphenols^	518mg GAE		414mg GAE
Beta-carotene eq	35ug		28ug
Anthocyanins^^	488mg		390mg

Source: Aust Food Comp Data or ^ USDA

^^Wu et al

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

A raspberry is a fruit made up of little fruitlets all combined together. Raspberries are bursting with nutrients and phytochemicals that all combined deliver brain health benefits.

Raspberry antioxidants and anti-inflammatories

Raspberries contain a number of antioxidants – vitamin C, vitamin E, manganese, as well as polyphenols including anthocyanins and other such as ellagitannins. Together they all contribute antioxidant protection for body cells, helping to overcome the effects of free radical damage. These compounds also have anti-inflammatory effects. Chronic inflammation is linked with several chronic diseases and aging.¹

An analysis of the Australian Health Survey found the average intake of anthocyanins by Australian adults was 24mg a day - higher than other country estimates. Across all age groups berries including raspberries were the main source. A 125g punnet of raspberries contains 490mg of anthocyanins.²

Published studies support the neuroprotective effects of several antioxidant-rich fruit especially raspberries. Raspberries are able to reduce glycation a process linked with several neurodegenerative disorders, including Alzheimer's Disease. A raspberry extract was able to reduce the clustering effect and toxicity of β -amyloid protein thought to be involved in Alzheimer's Disease development.³

Anthocyanins have well known anti-inflammatory effects in the brain and nervous system, but new research has found they have an effect on gut bacteria too. Anthocyanins from a berry extract altered the gut bacteria population and produced communication compounds linking the gut and the brain. The authors conclude anthocyanins can be added to a new group of "biotics" the psychobiotics – compounds that can affect gut bacteria which in turn affect the brain.⁴ Other researchers have found similar beneficial gut bacteria effects from berries.^{5,6}

Berries can also positively impact learning and memory in aged animal models.⁷

Berry good mood benefits in general

A review of 61 studies found a high total intake of fruit and vegetables (and specific subgroups including berries) may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms in adults.⁸

Another research group found intake of raw fruit and vegetables is linked with better mental health - reduced depressive symptoms and higher positive mood, life satisfaction, and flourishing. The top 10 raw foods related to better mental health included fresh berries.⁹

A 2005 analysis of data collated in Finland in 1966 found an association between optimism and health habits among 8690 31-year-old men and women. More optimistic women and men were more likely to consume berries for instance (23%/9%) compared to those less optimistic (14%/5%).¹⁰ A more recent study found similar results - that optimistic people eat healthier diets including fruit and vegetables.¹¹

Enjoying a superberry smoothie including raspberries may just get the brain's juices flowing – 40 people aged 20–30 years drank a 400mL smoothie containing equal parts blueberry, strawberry, raspberry and blackberry. Following cognitive tests and mood surveys, the berry smoothie drinkers

maintained accuracy on both cognitive tasks up to and including 6 hours after drinking it. They also demonstrated quicker response times. There was a positive effect on mood between 4-6 hours after the drink. So if you have a busy afternoon and need maximum brain power get stuck into the berries from mid-morning.¹²

That punnet of raspberries is looking really good right about now. An optimistic addition to a healthy diet for a healthy brain.

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NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem.* 2006;54(11):4069-4075. doi:10.1021/jf060300I <https://pubmed.ncbi.nlm.nih.gov/16719536/>

SEARCH TERMS USED FOR PUBMED: Raspberry and/or *Rubus idaeus* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

59. ROCKMELON A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Rock on with rockmelon and get psyched with vitamin C.
- Cantaloupe will help you to cope. Rich in vitamin C for psychological wellbeing.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/Aussie rockmelon.

Rockmelon:

- ✓ Rich in vitamin C – feel psyched
- ✓ Source of folate – psychological wellbeing
- ✓ Contains natural fruit sugars – boost vitality
- ✓ Contains beta-carotene – antioxidant protection
- ✓ Contains polyphenols – antioxidant protection
- ✓ Contains fluids – for hydration
- ✓ Contains potassium – nerve function

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Rockmelon fun facts:

- In Australia we call it rockmelon but across the globe it's called 'cantaloupe', 'mushmelon', 'sweet melon', 'Persian melon' and 'spanspek'.
- The cantaloupe (rockmelon) was first cultivated in the 1700s, in the Italian papal village of Cantalup. Now we know where they got the name from!
- Rockmelons are a perfect ingredient in fruit salads and antipasto platters. They can also be made into sorbet and ice cream.
- Rockmelons are considered a luxury and are commonly given as a gift in Japan.
- Rockmelon are members of vine-crop family, including other melons, squash, cucumbers, pumpkins, and gourds.
- Rockmelon gets its vibrant orange colour from beta-carotene, which helps to keep your skin healthy and strong and may even make you appear more attractive!^{1,2,3}
- As rockmelon is so high in vitamin C, it is a great fruit to support immunity thanks to this powerful antioxidant.⁴

NUTRITION INFORMATION

Serving size: 150g (1 cup diced raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	137g		91g
Energy	149kJ	2%	99kJ
Protein	0.8g	2%	0.5g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	7.1g	2%	4.7g
Sugars	7.1g	8%	4.7g
Sodium	21mg	<1%	14mg
Potassium	323mg		215mg
Folate eq	30ug	15%	20ug
Vitamin C	51mg	128%	34mg
Total polyphenols^	138mg GAE		92mg GAE
Beta-carotene eq	1170ug		782ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

1. Ip FW et al. Carotenoid skin colouration enhances face and body attractiveness: A cross-cultural study. *Q J Exp Psychol (Hove)*. 2019 Nov;72(11):2565-2573. <https://pubmed.ncbi.nlm.nih.gov/31035862/>
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NIP nutrient composition database references

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 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR ROCKMELON**Individual consumer friendly nutrient content and permitted general level health claims:**

- If you want a rock'in mood, eat rockmelon. One cup of this lush orange coloured fruit will give you more than 100% of your daily vitamin C needs. Vitamin C contributes to psychological function and a good mood.
- One cup of rockmelon (150g) provides 15% of the RDI for folate, a nutrient required for psychological wellbeing.
- Rock your summer snack times with rockmelon. They can boost your energy with natural fruit sugars.
- A serve of smooth rockmelon contains around 137ml of fluids contributing to your body's hydration.
- Rockmelon contains 320mg potassium which supports normal functioning of the nervous system.
- With over 1170ug of beta-carotene no wonder rockmelon has a vibrant orange colour. It's also beneficial as an antioxidant to protect body cells from oxidative stress.
- Rockmelon contains 138mg of polyphenol antioxidants, which protects your body cells from free radical damage.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim PLUS HYDRATION:

- A healthy, varied diet containing a variety of fruit, vegetables and mushrooms contributes fluids to help hydration, and maintain brain function and mood.

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as rockmelon, is good for mental wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 150g (1 cup diced raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	137g		91g
Energy	149kJ	2%	99kJ
Protein	0.8g	2%	0.5g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	7.1g	2%	4.7g
Sugars	7.1g	8%	4.7g
Sodium	21mg	<1%	14mg
Potassium	323mg		215mg
Folate eq	30ug	15%	20ug
Vitamin C	51mg	128%	34mg
Total polyphenols^	138mg GAE		92mg GAE
Beta-carotene eq	1170ug		782ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Deliciously moist and nutritious, rockmelon will keep you rocking with its mood boosting nutrients. This juicy fruit drips natural goodness including antioxidants: vitamin C, polyphenols and carotenoid beta-carotene.¹

These antioxidants protect body cells from free radical damage, and support brain health.² There is emerging evidence that antioxidant-rich fruit like rockmelon, help to improve cognitive health by preventing or delaying the onset of cognitive decline during ageing.³

When we think of rockmelon we immediately think of the vibrant orange colour, which comes from beta-carotene and beta-cryptoxanthin. Both are provitamin A carotenoids, which convert to vitamin A in the body.⁴ Beta-carotene specifically has been linked to higher levels of optimism.⁵ What a positive reason to eat smooth textured rockmelon.

Fruit such as rockmelon have been shown to have a positive influence on mental health. A review of 61 studies analysing the fruit and vegetable intake and mental health in adults found a high total intake of fruit and vegetables may promote higher levels of optimism and result in less psychological distress.⁶

It seems an eating pattern with plenty of fruit and vegetables really does help you look on the bright side. A large study of nearly 9,000 adults in Finland found eating fresh vegetables and salads, salad dressing, berries and fruit was associated with a more optimistic outlook on life.⁷

A study of women aged 45-60 years in Poland found women who ate raw vegetables, fruit, nuts, plant oils, and fruit and vegetable juices more frequently had higher levels of self-efficacy. Whereas those who ate fruit, nuts and fruit juices more frequently had higher levels of optimism and satisfaction with life.⁸

A population study in France of nearly 33,000 people found optimism was associated with overall diet quality and higher consumption of fruit, vegetables and nuts.⁹

Rockmelon contains about 90% moisture that can contribute to your total body fluids, helping you to keep hydrated. Getting enough fluids is important for brain function, emotional wellbeing and mood. Studies in adults' show just a small loss of body fluids (around 1%) is enough to increase negative emotions such as anger, confusion, tension, anxiety and depression, while consuming fluids can improve cognitive function and mood.¹⁰

There are a number of ways to enjoy this moist fruit and keep up hydration.

Why don't you try:

- Blending fresh rockmelon in a high-speed blender and add some sparkling water for a delightfully refreshing drink in the warm months of the year,
- In a blender, purée rockmelon and peeled soft peaches to make delicious cold soup. Add lemon juice and honey to taste,
- Topping rockmelon slices with yogurt and chopped mint,
- Slicing melons in half horizontally, scoop out seeds and use each half as a basket in which to serve fruit salad, topped with yoghurt and passionfruit.

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 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Rockmelon and *Cucumis melo* L. var. *reticulatus* Naudin and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

60. SILVERBEET A GOOD MOOD FOOD

(Representing “green leafy” vegetables in the current social media tiles)



WEBSITE COPY

Consumer fun inspirational key nutrition messages:

- If you're run off your feet, eat some silverbeet. Cooked silverbeet is rich vitamin B6 to keep up optimal brain function.
- Cooked silverbeet is rich in vitamin C which boosts your mood and keeps you firing on all cylinders.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie silverbeet.

Silverbeet:

- ✓ Rich in vitamin B6 – brain performance
- ✓ Rich in vitamin C – mood booster
- ✓ Source of folate – psychological wellbeing
- ✓ Source of iron – brain function
- ✓ Source of manganese – energy metabolism
- ✓ Contains colourful beta-carotene – brain health
- ✓ Contains polyphenols - antioxidant protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Silverbeet fun facts:

- Plant silverbeet in your back garden. After cutting a few leaves the plant will quickly re-sprout, providing you with an ongoing supply of leafy greens.
- Rainbow chard is a type of silverbeet with red, purple, orange, yellow or cream stalks.
- Silverbeet is very rich in Vitamin K, an essential nutrient to help your blood clot properly and build bones.¹
- Cheese and silverbeet are a match made in heaven.

References for website:

- 1) National Health and Medical Research Council. Nutrient Reference Values for Australia and New Zealand: vitamin K. <https://www.nrv.gov.au/nutrients/vitamin-k>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

NUTRITION INFORMATION

Serving size: 75g (1/2 cup boiled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	69g		92g
Energy	58kJ	1%	77kJ
Protein	1.4g	3%	1.8g
Total fat	0.2g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	0.9g	<1%	1.2g
Sugars	0.9g	1%	1.2g
Sodium	164mg	7%	218mg
Vitamin B6	0.5mg	34%	0.7mg
Folate eq	34.5ug	17%	46ug
Vitamin C	10.5mg	26%	14mg
Vitamin K ug^	371ug	460%	494ug
Iron	1.9mg	16%	2.6mg
Manganese	1.1mg	21%	1.4mg
Total polyphenols^	154mg GAE		205mg GAE
Beta-carotene eq^	1300ug		1730ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

SUBSTANTIATION FOR SILVERBEET

Individual consumer friendly nutrient content and permitted general level health claims:

- If you're run off your feet, eat some silverbeet. Just ½ cup of cooked silverbeet is rich in vitamin B6 (34% RDI) to keep up optimal brain function.
- Cooked silverbeet is rich in vitamin C which boosts your mood and keeps you firing on all cylinders. Just ½ cup contains a quarter of your daily vitamin C needs.
- A serve of gorgeous green silverbeet foliage provides 17% of your daily folate requirements. Green is good. Good for a happy mood and a healthy brain.
- Iron is well known for boosting energy but it's also needed for cognition and brain function. Cooked silverbeet provides nearly 2mg of plant iron in just ½ cup (16% RDI).
- Silverbeet is a source of manganese with 21% RDI in a serve. Manganese is needed for energy production.
- As a plant food silverbeet contains fibre which maintains a normal bowel function. A single serve provides 2g or 6% of daily fibre needs.
- The beautiful orange colour of beta-carotene may be masked by the gorgeous green but it's in there. Beta-carotene is a carotenoid antioxidant which helps protect body cells (1300ug in a serve).
- Silverbeet contains 154mg of polyphenols offering antioxidant protection.

NUTRITION INFORMATION

Serving size: 75g (1/2 cup boiled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	69g		92g
Energy	58kJ	1%	77kJ
Protein	1.4g	3%	1.8g
Total fat	0.2g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	0.9g	<1%	1.2g
Sugars	0.9g	1%	1.2g
Sodium	164mg	7%	218mg
Vitamin B6	0.5mg	34%	0.7mg
Folate eq	34.5ug	17%	46ug
Vitamin C	10.5mg	26%	14mg
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Total polyphenols^	154mg GAE		205mg GAE
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Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

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GAE means Gallic Acid Equivalents

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as silverbeet as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of green leafy vegetables such as silverbeet is good for brightening your mood, brain function, psychological wellbeing and happiness.

Subcategory COOKING claim:

- Why not cook up a silverbeet storm! Cooking together has positive effects on wellbeing and quality of life.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and so not suitable for branded communications. Instead this information is for educational purposes only.

There is good evidence that high vegetable intake is related to better mental health. Eating lots of green leafy vegetables such as silverbeet can lead to less perceived stress and improve a negative mood.¹

A review of 61 studies investigating fruit and vegetable intake and mental health in adults found a high intake may promote higher levels of optimism and self-efficacy (believing in yourself) and reduce levels of psychological distress. Including silverbeet and other green leafy vegetables in your diet can have a positive influence on mental health.²

Cooking can promote positivity, as it requires mastering a number of skills that exercise the brain and require heightened cognition. Mastering these skills can lead to improved mood, self-confidence, as well as self-awareness.³

Compared to raw fruit and vegetables, cooking can increase the bioavailability of some nutrients, allowing better absorption by your body, specifically iron and beta-carotene which is found in silverbeet.⁴

To get more silverbeet in mix it with cheese - silverbeet cheese quiche, silverbeet and cheese pastry triangles and silverbeet and potato cheese-topped soup – so many silvery ideas.

References for substantiation

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Silverbeet or *Beta vulgaris* and review and diet and [mood/cognition/mental health/psychological wellbeing/ cognition/happiness/antioxidants]



61. STRAWBERRY A GOOD MOOD FOOD

WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Feel strawsome! Vitamin C-rich strawberries have some serious mood boosting powers.
- Wake up strawsome – start the day with folate-rich strawberries and have a seriously awesome day.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie strawberries.

Strawberry:

- ✓ Rich in vitamin C – mood booster
- ✓ Rich in folate – mood booster
- ✓ Source of biotin – mood booster
- ✓ Contain potassium – nerve function
- ✓ Source of manganese – energy production
- ✓ Contains natural fruit sugars – fuel source
- ✓ Source of fibre – gut health
- ✓ Contains polyphenols – antioxidant protection
- ✓ Contains anthocyanins – antioxidant protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Strawberry fun facts:

- Strawberries aren't technically a berry they don't have seeds on the inside.
- The average strawberry has 200 seeds – on the outside. These seeds contribute to strawberries fibre content 4g in a 150g serve.
- Strawberries at room temperature taste sweeter than cold strawberries.
- Don't wash strawberries until you're ready to eat them as it speeds up spoiling.
- The ancient Romans believed that strawberries alleviated symptoms of melancholy.¹

NUTRITION INFORMATION

Serving size: 150g (1 cup whole raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	138g		92g
Energy	164kJ	2%	109kJ
Protein	1.1g	2%	0.7g
Total fat	0.3g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	5.9g	2%	3.9g
Sugars	5.7g	6%	3.8g
Dietary fibre	3.8g	13%	2.5g
Sodium	0mg	0%	0mg
Potassium	278mg		185mg
Folate eq	59ug	29%	39ug
Biotin	3ug	10%	2ug
Vitamin C	67.5mg	169%	45mg
Manganese	0.5mg	11%	0.36mg
Total polyphenols^	498mg GAE		332mg GAE
Anthocyanin^^	48mg		32mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

- 1 <https://web.extension.illinois.edu/strawberries/history.cfm>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem.* 2006;54(11):4069-4075. doi:10.1021/jf060300I <https://pubmed.ncbi.nlm.nih.gov/16719536/>

SUBSTANTIATION FOR STRAWBERRY

Individual consumer friendly nutrient content and permitted general level health claims:

- Feel strawsome! Vitamin C-rich strawberries have some serious mood boosting powers. Get over 100% of daily vitamin C needs in just 1 cup (150g) for psychological wellbeing.
- Wake up strawsome – start the day with folate-rich strawberries and have a seriously awesome day. A cup of strawberries provides nearly 30% of the RDI for folate needed for psychological function.
- Strawberries are a source of mood boosting biotin with 10% of the RDI in 150g. Biotin is needed for psychological wellbeing.
- A 150g cup of strawberries contains 278mg of potassium which is an electrolyte needed for a normal nervous system.
- Manganese play a role in the body's energy factories. A serve of strawberries (150g) provides 11% of the RDI.
- Strawberries have a sweet tart flavour with 6g of natural fruit sugars in 150g - a fuel source for the body.
- Strawberries are a source of fibre with nearly 4g in a serve. Fibre is needed for a healthy gut function.
- Strawberries contain just under 500mg of polyphenols antioxidants in a 150g serve – protecting cells from free radical damage.
- The pretty strawberry pink-red colour is thanks to antioxidant anthocyanins (48mg in 150g) – to protect cells from free radical damage.

NUTRITION INFORMATION

Serving size: 150g (1 cup whole raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	138g		92g
Energy	164kJ	2%	109kJ
Protein	1.1g	2%	0.7g
Total fat	0.3g	<1%	0.2g
Saturated fat	0g	0%	0g
Total Carbohydrates	5.9g	2%	3.9g
Sugars	5.7g	6%	3.8g
Dietary fibre	3.8g	13%	2.5g
Sodium	0mg	0%	0mg
Potassium	278mg		185mg
Folate eq	59ug	29%	39ug
Biotin	3ug	10%	2ug
Vitamin C	67.5mg	169%	45mg
Manganese	0.5mg	11%	0.36mg
Total polyphenols^	498mg GAE		332mg GAE
Anthocyanin^^	48mg		32mg

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as strawberries, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as strawberries is good for mental wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Strawberries are fun, fun to grow, fun to eat, fun to cook with. They go well with chocolate, nuts, other fruit and honey but surprisingly they pair well with avocado, black pepper, balsamic vinegar, chilli or spinach¹ – mind blown! Their sweet tart flavour is a complex mixture of 30 different compounds.²

Strawberry enjoyment is not just about the eating and the cooking, they contain nutrients and phytochemicals with mood and brain boosting benefits too.

Strawberry – mood boosting

Research has shown that even just looking at strawberry plants can improve mood. Heart rate and salivary cortisol (a stress hormone) were significantly decreased after viewing strawberry plants for 15 minutes. "Tension" and "confusion" scored using the Profile of Mood States negative mood subscales, and "anxiety" levels measured using the State-Trait Anxiety Inventory scale were all significantly reduced.³

Fruit and vegetable consumption in general also boosts mood, increasing positive emotions and decreasing negative emotions leading to better mental health.

A systematic review of 61 studies found high total intake of fruit and vegetables, and some of their specific subgroups including berries, may promote higher levels of optimism and self-efficacy, as well as reduce levels of psychological distress.⁴

People who eat more fruit and vegetables have a lower incidence of mental disorders, including lower rates of depression, perceived stress, and negative mood. And they also have a higher likelihood of optimal mental states, such as greater happiness, positive mood, life satisfaction and social and emotional "flourishing" - feelings of meaning, purpose, and fulfilment in life. The top 10 raw foods related to better mental health included fresh berries.⁵

Eating fruit as a snack compared to an unhealthy snack such as chocolate or crisps, was found to be associated with lower anxiety and emotional distress.⁶

Strawberry – brain boosting

Strawberries go well with other fruit and other berries. Enjoying a superberry smoothie including strawberries may just get the brain's juices flowing – 40 people aged 20–30 years drank a 400mL smoothie containing equal parts blueberry, strawberry, raspberry and blackberry. Following cognitive tests and mood surveys the smoothie drinkers maintained accuracy on both cognitive tasks up to and including 6 hours after drinking it. They also demonstrated quicker response times. There was a positive effect on mood between 4-6 hours after the drink. So if you have a busy afternoon and need maximum brain power get stuck into the strawberries from mid-morning.⁷

Strawberries are also good for an aging brain. Higher strawberry intake was associated with a 24% reduced risk of developing Alzheimer's dementia (HR = 0.76, 95% CI: 0.60-0.96). Consumption of strawberries and foods rich in vitamin C, pelargonidin, anthocyanins, and total flavonoids like strawberries may reduce the risk of Alzheimer's dementia development.⁸

Greater intakes of blueberries and strawberries were associated with slower rates of cognitive decline. Berry intake appears to delay cognitive aging by up to 2.5 years. Additionally, greater intakes of anthocyanins and total flavonoids, found in strawberry, were also associated with slower rates of cognitive decline.⁹

Strawberry – antioxidants and anti-inflammatories

Strawberries have these mood and brain boosting effects because they contain a number of naturally occurring phytochemicals with antioxidant and anti-inflammatory effects.¹⁰⁻¹² The most abundant of these phytochemicals is ellagic acid, and certain flavonoids: anthocyanin, catechin, quercetin and kaempferol.¹²

Strawberry polyphenols are able to:

- detoxify free radicals blocking their production,
- modulate the expression of genes involved in metabolism, cell survival and proliferation, and antioxidant defences,
- protect and repair DNA damage. Oxidative stress drives a number of neurodegenerative diseases, and inflammation.¹³

A meta-analysis also found strawberry consumption reduces C reactive protein a measure of inflammation.¹⁴

The pretty red-pink colour of strawberry is due to anthocyanins. Anthocyanins in general are phytochemicals that may have a protective effect on the brain by improving cognitive performance and memory.¹⁵ Anthocyanins can also cross the blood-brain barrier and have a positive effect on areas of learning and memory.¹⁶ An interesting analysis of the Australian Health Survey found the average intake of anthocyanins by Australian adults was 24mg a day higher than international estimates.¹⁷ So we think Australians must be enjoying plenty of strawberries.

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SEARCH TERMS USED FOR PUBMED: Strawberry and/or *Fragaria ananassa* Duch. and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

62. SULTANA A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Life's sweet with sultanas – packed with natural energising fruit sugars.
- Life's golden with golden sultanas – packed with polyphenols for antioxidant defences.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie Sultanas.

Sultana:

- ✓ Contains polyphenols – antioxidant defence
- ✓ Contains natural fruit sugars – for energy
- ✓ Contains potassium – steady nerves

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Sultana fun facts:

- Sultanas are dried Thompson seedless grapes with a golden colour – often called golden raisins.
- The golden colour may also come from a treatment with sulfur dioxide, as well as traditional drying methods.
- The variety originated from the Iranian town of Soultanleh, from which it gets its name. It found its way to Australia in 1867.
- Sultana grape harvest begins in mid-February in Australia.
- Sweet sultanas are often used in sweet breads, cakes, buns, scones, muesli bars and slices.
- They may be sticky but raisins do not stick to teeth for long nor cause dental caries in fact the high antioxidant content is thought to be protective as it inhibits the bacteria that causes dental caries.²⁻⁷
- Sultanas and raisins are a prebiotic (food) for probiotics (gut bacteria) and can affect the growth of certain types of good bacteria.^{8,9}
- Sultanas and raisins are a good cost effective carbohydrate source for fuelling prior to sport.^{10,11}

NUTRITION INFORMATION

Serving size: 30g (1.5tb)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	5g		16g
Energy	320kJ	4%	1070kJ
Protein	0.8g	2%	2.6g
Total fat	0.1g	<1%	0.3g
Saturated fat	0g	0%	0g
Total Carbohydrates	18.2g	6%	60.8g
Sugars	17.7g	20%	59g
Sodium	2mg	<1%	7mg
Potassium	287mg		955mg
Total polyphenols^	314mg GAE		1045mg GAE

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

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 ^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR SULTANA

Individual consumer friendly nutrient content and permitted general level health claims:

- 1.5 tablespoons of sultanas contains 310mg of polyphenols needed for antioxidant defence of body cells.
- A 30g serve of sultanas contains about 20g of energising fruit sugars – natural brain fuel.
- A 30g handful of sultanas contains 287mg potassium needed for a healthy nervous system.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as sultanas, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as sultanas is good for mental wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 30g (1.5tb)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	5g		16g
Energy	320kJ	4%	1070kJ
Protein	0.8g	2%	2.6g
Total fat	0.1g	<1%	0.3g
Saturated fat	0g	0%	0g
Total Carbohydrates	18.2g	6%	60.8g
Sugars	17.7g	20%	59g
Sodium	2mg	<1%	7mg
Potassium	287mg		955mg
Total polyphenols^	314mg GAE		1050mg GAE

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Sultanas are known as golden raisins around the world. Raisins and sultanas have been eaten by people for thousands of years as drying grapes was an easy way to preserve the fruit. They may not have known why but traditional Persian medicine included raisins in a diet to help treat Alzheimer's Disease.¹ Raisins and sultanas contain polyphenol antioxidants and, while the research is in its infancy, it appears the polyphenol antioxidants in grape products may just help preserve brain function in animal models of depression and Alzheimer's Disease.²⁻⁵

Grape derived polyphenols like those in raisins and sultanas appear to normalise raised levels of pro-inflammatory cytokines and abnormal levels of brain derived neurotrophic factor. This helps restore impaired synaptic nerve cells that lead to depressive behaviour in animal models of stress.² Similarly they may also effectively improve the learning and memory abilities of rats with Alzheimer's Disease.³ Raisin and sultanas have also been found to significantly raise blood antioxidant levels and promotes cognitive and motor performance in aging rats.^{4,5}

The most abundant antioxidant polyphenols in raisins and sultanas are the flavonols, quercetin and kaempferol; and the phenolic acids, caftaric and coutaric acid. In human studies, raisins/sultanas affect certain oxidative biomarkers.⁶ In a study of 15 men reviewing the antioxidant capacity and phenolic content of green Thompson seedless grapes, sun-dried raisins, and golden raisins they consumed over a 4 week period, golden raisins had the highest antioxidant capacity and phenolic content.⁷

These compounds in raisins and sultanas also reduce inflammatory markers. Thirty-four men and postmenopausal women were randomly assigned to consume 1 cup raisins a day for 6 weeks and found the raisins decreased TNF- α - an inflammatory cytokines.⁸ Inflammatory plays a role in brain function decline.

Who didn't have a box of sultanas in their lunch box as a kid? Eating fruit as a snack compared unhealthy snacks such as chocolate or crisps, was associated with lower anxiety and emotional distress in a study of 100 students.⁹ In both adults and children increased fruit intake may improve psychological wellbeing.^{10,11} The Australian Victorian Child's Health and Wellbeing study (3,370 children) observed that children with a higher number of daily fruit servings had significantly better odds of emotional control, problem management and relationship building skills (pro-social behaviour).¹¹

So many reasons why we all need to get back into sultanas and it's perfectly OK for kids to enjoy sultanas in their lunchbox.

References for substantiation

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SEARCH TERMS USED FOR PUBMED: Sultana and/or *Vitis vinifera* and review and diet and [mood/psychological wellbeing/ optimism/ brain function/ cognition/]

63. SWEETCORN A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Life is sweeter with sweetcorn. Contains niacin for psychological wellbeing.
- Feel forlorn? Eat sweetcorn. Contains niacin for psychological wellbeing.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie sweetcorn.

Sweetcorn:

- ✓ Source of niacin – psychological wellbeing
- ✓ Source of fibre – healthy gut
- ✓ Contains polyphenols – antioxidant protection
- ✓ Low Glycemic Index carbs – sustained energy

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Sweetcorn fun facts:

- Sweet corn is a sweeter type of maize variety.
- The sweetcorn plant is a tall grass that produces kernels that can be eaten raw or cooked, straight from the cob or removed and served in dozens of ways: as a side dish, in salads, fritters.
- There are about 800 kernels on each ear of corn.
- Yellow sweetcorn contains more carotenoids beta-carotene and lutein zeaxanthin than the white variety. Beta-carotene is an antioxidant that our bodies convert to vitamin A, an essential nutrient for good eye health.^{1,2}
- Popcorn is made by heating dried corn kernels. The moisture in the kernels heats up, turns to a gas and explodes out forcing all the carbohydrate to puff up.

NUTRITION INFORMATION

Serving size: 75g (1/2 ear boiled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	58g		77g
Energy	286kJ	3%	381kJ
Protein	2.9g	6%	3.8g
Total fat	1.4g	2%	1.9g
Saturated fat	0.4g	2%	0.5g
Total Carbohydrates	9.8g	3%	13.0g
Sugars	4.2g	5%	5.6g
Dietary fibre	3g	10%	4g
Sodium	14.3mg	<1%	19.0mg
Niacin eq	1.2mg	12%	1.6mg
Total polyphenols^	131mg GAE		174mg GAE
Beta-carotene eq	5ug		6ug
Lutein zeaxanthin^	483ug		644ug
Glycemic Index^^	55		

Source: Aust Food Comp Data or ^ USDA data
GI=55 (average of 8)

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

- 1 Rasmussen HM, Johnson EJ. Nutrients for the aging eye. *Clin Interv Aging*. 2013;8:741-748. doi:10.2147/CIA.S45399. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3693724/>
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^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SUBSTANTIATION FOR SWEETCORN

Individual consumer friendly nutrient content and permitted general level health claims:

- Life is sweeter with sweetcorn. Add half a sweetcorn ear to your daily diet for 12% of your niacin needs. Niacin supports positive psychological wellbeing.
- Improve your gut health with half an ear of sweetcorn. It provides 10% of your daily fibre needs or 3g of fibre.
- One serve (75g) of sweetcorn contains 131mg of polyphenol antioxidants which protect body cells.
- Sweetcorn contains low to moderate Glycemic Index carbs (GI=55) so can provide sustained energy throughout the day.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables such as sweetcorn is good for brightening your mood, brain function, psychological wellbeing and happiness.

Subcategory COOKING claim:

- Get cooking with sweetcorn. Cooking together has positive effects on wellbeing and quality of life.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 75g (1/2 ear boiled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	58g		77g
Energy	286kJ	3%	381kJ
Protein	2.9g	6%	3.8g
Total fat	1.4g	2%	1.9g
Saturated fat	0.4g	2%	0.5g
Total Carbohydrates	9.8g	3%	13.0g
Sugars	4.2g	5%	5.6g
Dietary fibre	3g	10%	4g
Sodium	14.3mg	<1%	19.0mg
Niacin eq	1.2mg	12%	1.6mg
Total polyphenols^	131mg GAE		174mg GAE
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Lutein zeaxanthin^	483ug		644ug
Glycemic Index^^	55		

Source: Aust Food Comp Data or ^ USDA data
GI=55 (average of 8)

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

The small kernels of sweetcorn contain so much goodness that support positive psychological wellbeing and a healthy brain function. Who doesn't love mowing down the rows of kernels on a buttered corn cob. Enjoy this Aussie favourite raw or cooked in so many ways. A little bit of sweetcorn is sure to make your day a little bit sweeter.

A few studies have analysed the vegetable food group and found people enjoying higher amounts of vegetables had an 18% lower risk of experiencing symptoms of depression.¹ Other researchers found the days when more vegetables are eaten means enhanced psychological wellbeing.² On days when individuals consumed 0.15 more portions of vegetables (and 0.11 more portions of fruit), they experienced higher positive affect, which included feeling calmer, happier, and more energetic.^{3,4} An Australian Mediterranean diet study found people in the study with greater vegetable diversity had greater reduction in depression and improved mental health scores - sustained over 6 months.⁵

The yellow colour of sweetcorn is thanks to clever carotenoids lutein and zeaxanthin. Carotenoids appear to have cognitive benefits. In the large US NHANES study, the highest consumers of lutein and zeaxanthin performed better in cognitive tests than the lowest consumers.⁶

Sweetcorn provides 10% of daily fibre needs in every serve. Diets high in fibre can optimise the microbiota to positively impact psychological wellbeing. Short chain fatty acids such as butyrate and propionate directly affect brain physiology and behaviour by reducing brain inflammation and managing overall brain maintenance.⁷

Cooking in general can promote positivity, as it requires mastering a number of skills that exercise the brain and require heightened cognition. Mastering these skills can lead to improved mood, self-confidence, as well as self-awareness.⁸

The classic way to serve sweetcorn is steamed or barbequed with butter. But there are many other ways to serve this delectable yellow vegetable.

Why not try:

- Sweetcorn and zucchini fritters which is a sure family-friendly favourite
- Add in spices and herbs into the butter before spreading on the corn cob. Try cardamom, all spice or even some grated orange or lemon zest
- Dice some tomatoes and chopped parsley together with fresh corn kernels for a refreshing salsa to go with meat, chicken or fish.

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 ^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SEARCH TERMS USED FOR PUBMED: Sweetcorn and *Zea mays* and review and diet and [mood/psychological wellbeing/ optimism/ brain function/ cognition/]

64. SWEET POTATO A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Feast your mind. Sweet potato is niacin-rich needed for psychological wellbeing.
- Supercharge your day with the energy boosting power of pantothenic acid in sweet potato.
- Life is sweeter with sweet potato. Sweet potato contains carbohydrates to fuel your hungry brain.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/Aussie sweet potato.

Sweet potato:

- ✓ Rich in niacin – psychological wellbeing
- ✓ Rich in pantothenic acid - fatigue fighter
- ✓ Rich in vitamin C – good mood
- ✓ Source of vitamin B6 – brain function
- ✓ Source of vitamin E – antioxidant protection
- ✓ Contains potassium – steady nerves
- ✓ Contains carbs – brain fuel
- ✓ Good source of fibre – happy gut
- ✓ Super rich in orange beta-carotene – antioxidant protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity page)

Sweet potato fun facts:

- Did you know sweet potato is called kumara in New Zealand?
- Sweet potatoes come in different colours: gold, red, white and purple. The gold variety is the most popular in Australia- we go for gold!
- The beta-carotene in golden sweet potato is converted to vitamin A in the body which is required for good vision – sweet potato is *clearly* an excellent vegetable!¹
- Sweet potato feeds your brain. Glucose is the brain's primary fuel source and it needs a constant supply, which it gets from carbohydrates in food such as sweet potato.²
- Sweet potatoes can be served in savoury and sweet dishes and go well with warming spices such as cinnamon, nutmeg, ginger and allspice.

NUTRITION INFORMATION

Serving size: 150g (½ sweet potato baked)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	111g		74g
Energy	536kJ	6%	357kJ
Protein	3.5g	7%	2.3g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	25.8g	8%	17.2g
Sugars	10.2g	11%	6.8g
Dietary fibre	4.7g	16%	3.1g
Sodium	18mg	<1%	12mg
Potassium	458mg		305mg
Niacin eq	2.8mg	28%	1.9mg
Pantothenic acid^	1.3mg	27%	0.9mg
Vitamin B6	0.4mg	24%	0.3mg
Vitamin C	45mg	113%	30mg
Vitamin E	1.2mg	12%	0.8mg
Total polyphenols^	350mg GAE		233mg GAE
Beta-carotene eq	11,200 ug		7,440ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR SWEET POTATO

Individual consumer friendly nutrient content and permitted general level health claims:

- Half a cooked sweet potato (150g) provides 28% of the RDI for niacin. Niacin, or vitamin B3, is important for psychological wellbeing.
- Pantothenic acid (vitamin B5) is needed for mental performance and to combat tiredness. Nearly a third (27%) of the RDI for pantothenic acid is found in half a cooked sweet potato (150g).
- Sweet potato is a surprisingly rich source of vitamin C with a 150g serve providing 113% RDI. You might know vitamin C is important for immunity, but it is also required for psychological function, brain and nerves, and to overcome fatigue.
- With a swag of energising and mood-boosting benefits, sweet potato is also a source of vitamin B6, providing 24% of the Recommended Dietary Intake (RDI). This vitamin is essential for positive mood and energy production.
- Sweet potato provides antioxidant protection due to its vitamin E. Vitamin E can shield the mind and body from the stress of free radicals. One serve provides 12% of the RDI for Vitamin E. Vitamin E also needs vitamin C to return to its antioxidant self so it's Mother Nature magic that there's vitamin C in sweet potatoes too.
- Steady as she goes... to balance out all that mental performance and energy, 150g of sweet potato contains 458mg potassium to help the nervous system.
- Sweet potato is called sweet potato due to its natural sugars and carbohydrates. These are the brain's preferred fuel source. Half a sweet potato provides 26g of carbs and 10g of natural sugars.
- Sweet potato is a good source of fibre especially with the skins. Half a potato holds 5g of fibre.
- Beta-carotene is the bright orange colour of gold sweet potatoes. In fact sweet potato is one of the highest plant source of beta-carotene with half a potato containing a whopping 11mg. Beta-carotene is a carotenoids antioxidant offering cell protection from free radicals.

NUTRITION INFORMATION

Serving size: 150g (½ sweet potato baked)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	111g		74g
Energy	536kJ	6%	357kJ
Protein	3.5g	7%	2.3g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	25.8g	8%	17.2g
Sugars	10.2g	11%	6.8g
Dietary fibre	4.7g	16%	3.1g
Sodium	18mg	<1%	12mg
Potassium	458mg		305mg
Niacin eq	2.8mg	28%	1.9mg
Pantothenic acid^	1.3mg	27%	0.9mg
Vitamin B6	0.4mg	24%	0.3mg
Vitamin C	45mg	113%	30mg
Vitamin E	1.2mg	12%	0.8mg
Total polyphenols^	350mg GAE		233mg GAE
Beta-carotene eq	11,200 ug		7,440ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as sweet potato as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables, such as sweet potato, is good for brightening your mood, brain function, psychological wellbeing and happiness.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Sweet potato is a versatile, satisfying and colourful veg with plenty of science to back up its mood boosting benefits.

Bioactive components of sweet potato

Sweet potato contains several components with health-promoting functions such as dietary fibre and resistant starch, colourful carotenoids and anthocyanins, and caffeoylquinic acids.¹

Sweet potato is rich in fibre and diets high in fibre can improve the population of gut bacteria to improve psychological wellbeing. Short chain fatty acids (SCFAs) such as butyrate and propionate are produced by gut bacteria when they ferment fibre and resistant starch in the large intestine. These SCFAs reduce brain inflammation, which helps keep brain cells healthy and preserves normal brain function and behaviour.²

Sweet potato is available in a range of colours including orange/gold, red, purple and white. Golden sweet potatoes are rich in a colourful carotenoid pigment called beta-carotene. Carotenoids protect against age-related diseases (such as cognitive decline) by acting as antioxidants, and counteracting oxidative stress through neutralising free radicals. Beta-carotene also helps control chronic inflammation which can lead to chronic disease.^{3,4} Quality of life and mental health have improved in people eating more fruit and vegetables, and consuming more beta-carotene and vitamin E.⁵ Good thing sweet potatoes also contain vitamin E – more on this below.

The antioxidant activity of sweet potato with purple, orange, and white flesh is likely due to both the presence of caffeoylquinic acid derivatives and anthocyanin content. There are 39 different anthocyanins that have been found in sweet potato! Anthocyanins appear to have a protective effect on the brain through improvement on cognitive performance and memory.⁶ The purple ones include cyanidin, peonidin, and pelargonidin derivatives. An animal study found the purple pigments from sweet potato were effective against cognitive damage and brain and nerve inflammation.⁴

Sweet potato also contains antioxidant vitamin E. Vitamin E has potent antioxidant and anti-inflammatory characteristics which influence immune function and cell signalling important for a healthy brain function. Interestingly people with Alzheimer's Disease have been found to have low levels of vitamin E in their blood. So eating more dietary sources may reduce the progression of the disease, preserving cognition.⁷

Fruit and vegetables, mental health, psychological wellbeing and mood

There is now good evidence that higher fruit and vegetable intake is related to better mental health. People who eat more fruit and vegetables have a lower incidence of mental disorders, including lower rates of depression, perceived stress, and negative mood. And they also have a higher likelihood of optimal mental states, such as greater happiness, positive mood, life satisfaction and "flourishing" - feelings of meaning, purpose, and fulfilment in life.⁸

High-quality diets regardless of type (healthy, prudent, Mediterranean) have been linked with a lower risk of depressive symptoms. People consuming higher amounts of vegetables had an 18% lower risk of experiencing depressive symptoms, and those with a low dietary inflammatory index had a 19% lower risk.⁹

For older people higher, long-term vegetable intake over five years has been linked with better cognition and lower information processing speeds. In particular, root vegetables were associated with better cognitive function.¹⁰

Bring on the sweet potato wedges!

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Sweet potato or *ipomoea batatas* and [mood/ mental/ psychological/ wellbeing/ health/ antioxidants/ carbohydrate mood]

65. TABLE GRAPE A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Be the pick of the bunch – grape vitamin C gets you in a great mood.
- Energising grape goodness with manganese - helps produce energy.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie grapes.

Table grape:

- ✓ Rich in manganese – energy producer
- ✓ Source of vitamin C – mood booster
- ✓ Good source of fibre – gut lover
- ✓ Contains natural fruit sugars – energiser
- ✓ Contains polyphenols – antioxidant defence
- ✓ Contains orange beta-carotene – antioxidant pigment
- ✓ Contains red –purple anthocyanin – antioxidant pigment
- ✓ Contains potassium – nerve function

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Table grape fun facts:

- Grapes are technically berries.
- Grapes come in many colours: white, red, black, blue, green, purple and golden.
- Grown on a vine - one vine usually produces 40 pyramid-shaped clusters of grape.
- One cluster contains 75 berries on average.
- Grape seeds are edible and chock-full of antioxidants.
- People consuming grape polyphenols have significantly reduced blood LDL cholesterol and oxidised LDL.^{1,2}

NUTRITION INFORMATION**

Serving size: 150g (1 cup raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	120g		80g
Energy	416kJ	5%	277kJ
Protein	1.4g	3%	0.9g
Total fat	0.2g	<1%	0.1g
Saturated fat	0g	0%	0g
Total Carbohydrates	21.5g	7%	14.5g
Sugars	21.8g	24%	14.5g
Dietary fibre	4.2g	14%	2.8g
Sodium	5mg	<1%	4mg
Potassium	268mg		179mg
Vitamin C	7.5mg	19%	5mg
Manganese^	1.6mg	32%	1.1mg
Total polyphenols^	1420mg GAE		946mg GAE
Beta-carotene eq	120ug		80ug
Anthocyanin^^	110mg		73mg

Source: Aust Food Comp Data or ^ USDA

**Average of green and black sultana grapes

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid equivalents

References for website:

1. Lupoli R, Ciciola P, Costabile G, et al. Impact of Grape Products on Lipid Profile: A Meta-Analysis of Randomized Controlled Studies. *J Clin Med.* 2020;9(2):313. doi:10.3390/jcm9020313
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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem.* 2006;54(11):4069-4075. doi:10.1021/jf060300I
<https://pubmed.ncbi.nlm.nih.gov/16719536/>

SUBSTANTIATION FOR TABLE GRAPE

Individual consumer friendly nutrient content and permitted general level health claims:

- Be the pick of the bunch – grape vitamin C gets you in a great mood. With 19% of vitamin C's RDI needed for psychological and neurological function.
- Energising grape goodness with manganese - your energy producer. A cup of grapes is manganese-rich with 32% of the RDI.
- 150g of grapes are a good source of gut loving fibre – 4g a serve
- Looking for a sweet snack tuck into a cup of grapes with fruit sugars the natural energiser.
- Grapes are polyphenol powerhouses with 1420mg per serve – for good antioxidant defence.
- A 150g serve of grapes contains 120ug beta-carotene an antioxidant pigment.
- Red purple grapes contain red purple anthocyanin – an antioxidant pigment.
- A cup of grapes contains 268mg of potassium - a mineral electrolyte needed for a healthy nervous system.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory FRUIT claim:

- A healthy, varied diet high in fruit such as grapes is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Grapes are the gorgeous sweet snack you need for an afternoon pick me up. Research proves why grapes, grape juices and grape extracts are beneficial for mind and body.

Grapes and better brain function

Purple grape juice improves cognition in adults young and old. Middle-aged and older adults drinking purple grape juice for 3-4 months found improved memory, verbal learning and driving ability.¹⁻³

Grapes and better mood

In 20 young people drinking 230ml of purple grape juice, the juice significantly improved measures of cognition and mood. Reaction times improved and calm ratings increase compared to those not drinking the grape juice.⁴ Potential mechanisms to explain these effects could be improved brain blood

NUTRITION INFORMATION**

Serving size: 150g (1 cup raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	120g		80g
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Sugars	21.8g	24%	14.5g
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Potassium	268mg		179mg
Vitamin C	7.5mg	19%	5mg
Manganese^	1.6mg	32%	1.1mg
Total polyphenols^	1420mg GAE		946mg GAE
Beta-carotene eq	120ug		80ug
Anthocyanin^^	110mg		73mg

Source: Aust Food Comp Data or ^ USDA

**Average of green and black sultana grapes

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid equivalents

flow. Although not all studies found additional benefits of grape consumption on mood and perceived health however.⁵

How do grapes affect brain function and mood?

Antioxidants and anti-inflammatories

Grapes, grape skins and grape seeds all possess powerful antioxidants that can decrease oxidative stress that occurs in aging. These reductions lead to improvements in behaviour.

Additional mechanisms include enhancement of neuronal communication via:

- increases in neuronal signalling and
- decreases in stress signals induced by oxidative/inflammatory stresses.⁶

Major depressive disorder (MDD) is associated with stress-induced immune dysregulation and reduced brain-derived neurotrophic factor (BDNF) levels in sensitive brain regions. Elevated levels of pro-inflammatory cytokines and reduced BDNF levels lead to impaired nerve cell signalling that contributes to depression development.

Evidence is growing that grape polyphenol consumption from 5 to 180mg/kg of body weight can normalise elevated levels of pro-inflammatory cytokines and abnormal levels of BDNF. This repairs nerve cells signalling that alleviates depressive behaviour in animal models of stress.⁷

Note: a 70kg man would need a 350-12,600mg and a 150g serve of grapes contains on average 1400mg of polyphenols.

Reduced oxidative stress

An animal study has demonstrated the free radical scavenging properties of grape skin and grape flesh extracts in rats given varying levels of alcohol generating oxidative stress.⁸

Grapes increase blood flow

Grape polyphenols were found to significantly increase flow mediated dilation (the elasticity of blood vessels to allow better blood flow) in healthy subjects. The increased FMD appeared to be more obviously in subjects with high cardiovascular risk factors.⁹ Better blood flow is equally important for the brain as well as heart.

Fruit and vegetables and mood

There is much evidence now of the benefits of fruit and vegetables in general on brain function and mood. Eating fruit as a snack such as grapes compared to unhealthy snacks such as chocolate or crisps, was found to be associated with lower anxiety and emotional distress.¹⁰

A systematic review of 61 studies found that a high total intake of fruit and vegetables may promote higher levels of optimism and self-efficacy, as well as reduce levels of psychological distress.¹¹

A recent study involving a nationally representative sample of 12,385 Australian adults surveyed over several years reported that combined fruit and vegetable consumption was predictive of increased happiness, life satisfaction and wellbeing, with improvements observed within 2years.¹²

For further information review sections on dried grapes: currant, raisin and sultana.

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem.* 2006;54(11):4069-4075. doi:10.1021/jf060300I <https://pubmed.ncbi.nlm.nih.gov/16719536/>

SEARCH TERMS USED FOR PUBMED: Table grapes and/or *Vitis vinifera* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

66. TOMATO (FRESH) A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Tomatototally awesome! Fresh tomato is rich in vitamin C needed for psychological wellness.
- The polyphenols and carotenoids in fresh tomato help maintain your brain and nervous system so you can think well and feel better.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/Aussie fresh tomatoes.

(Fresh) Tomato:

- ✓ Rich in vitamin C – psychological wellbeing
- ✓ Contains polyphenols – dampen oxidation
- ✓ Contains carotenoids – antioxidant protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

(Fresh) Tomato fun facts:

- Tomatoes are the classic fruit we eat as vegetables, or a 'fregetable'. They are the second largest 'vegetable' crop grown in Australia by volume and value.¹
- Did you know the first tomatoes in Europe were yellow and tomato in Italian is *pomodoro* which means golden apple.²
- Tomatoes contain a red coloured carotenoid called lycopene which supports prostate health in men.³
- Tomatoes ripen after picking so leave them on the bench until they're ready to eat. They taste better at room temperature too.
- Fresh tomato is delicious in salads, sandwiches, wraps, as a topping on crispbread/ bruschetta, or chopped into a salsa. Try a drizzle of extra virgin olive oil and a dash of balsamic vinegar, or sprinkling of sumac (spice) to bring out the flavour.
- The Spanish city of Buñol hosts the annual *tomatina* festival at which locals pelt each other with ripe tomatoes for fun (but what a waste of good tomatoes!)

NUTRITION INFORMATION

Serving size: 75g (1/2 medium raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	70g		94g
Energy	55kJ	1%	73kJ
Protein	0.5g	<1%	0.6g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	2.3g	<1%	3g
Sugars	1.9g	2%	2.5g
Sodium	3mg	<1%	4mg
Vitamin C	10.5mg	26%	14mg
Total polyphenols^	60mg GAE		80mg GAE
Beta-carotene	153ug		204ug
Lycopene^	460ug		613ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

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NIP nutrient composition database references

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR (FRESH) TOMATO

Individual consumer friendly nutrient content and permitted general level health claims:

- Half a medium tomato (75g) contains a quarter of the daily recommended amount of vitamin C. Vitamin C contributes to psychological and emotional wellbeing.
- A serve of fresh tomatoes contain 60mg of antioxidant polyphenols, which help dampen oxidation and protect body cells.
- The rich colour of fresh tomatoes is from carotenoids including beta-carotene and lycopene. These have powerful antioxidant activity that protects the body from oxidative stress.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as fresh tomato, as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of vegetables, such as fresh tomato, is good for brightening your mood, brain function, psychological wellbeing and happiness.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 75g (1/2 medium tomato raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	70g		94g
Energy	55kJ	1%	73kJ
Protein	0.5g	<1%	0.6g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	2.3g	<1%	3g
Sugars	1.9g	2%	2.5g
Sodium	3mg	<1%	4mg
Vitamin C	10.5mg	26%	14mg
Total polyphenols^	60mg GAE		80mg GAE
Beta-carotene	153ug		204ug
Lycopene^	460ug		613ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

A ripe and ready fresh tomato is a beautiful thing to look at and to eat. It needs nothing at all to embellish it, except maybe a knife and fork. And even then, this is optional especially when it comes to itty-bitty tomato varieties that you can simply pop straight in your mouth. Their beauty is not only skin deep, they are exploding with goodness from within.

Beneficial compounds in tomatoes

As a tomato ripens, the polyphenol and flavonoid content increases. The main phenolic compounds are: isoquercetin, chlorogenic acid, catechin, p-coumaric acid, syringic acid and gallic acid. Lycopene, a carotenoid that gives tomatoes their red colour, also increases during ripening. The cocktail of bioactive compounds in tomatoes gives them powerful antioxidant ability to help combat oxidative stress. Lycopene is a carotenoid with potent antioxidant ability that also has anti-vascular disease activity.¹

Why adding tomatoes to your diet will help you feel good

The beneficial effects of tomatoes can protect the brain and nervous system and this can maintain mental health and mood. The potent antioxidant powers of tomato can help to reduce the risk of psychological disorders such as depression, anxiety and emotional stress, and degenerative brain diseases.² Polyphenols dampen inflammation and this is good for mental wellbeing because chronic

systemic inflammation is implicated in poor mental health,³ and polyphenols can boost emotional resilience.⁴ Tomatoes have been identified as having potential for preventing atherosclerosis or hardening of the arteries that causes cardiovascular disease.^{5,6} Current evidence supports a link between cardiovascular disease and brain conditions such as stroke, dementia and cognitive impairment. Several large population studies have demonstrated that cardiovascular risk factors, aside for contributing substantially to the risk of stroke, negatively influence overall brain health.⁷ There are also links between coronary heart disease and mental illness as they may share common causes.⁸

Add tomatoes to the salad of life

Tomatoes are terrific but they do their best work together with other plant foods such as fruit, vegetables, mushrooms and nuts. The health benefits of fruit, vegetables, and other plant foods on psychological wellbeing are due to the many bioactive compounds (such as phytochemicals and antioxidants) and other nutrients (such as vitamins, minerals and fibre) working together to deliver healthy brain function.⁹ Tomatoes are a traditional food of the Mediterranean diet and this healthy eating pattern is associated with a lower risk of depression¹⁰ and is recommended by mental health experts for the prevention of depression¹¹.

A review of 61 studies analysing the association between fruit and vegetable intake and mental health in adults found a high total intake of fruit and vegetables may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms. The authors concluded the general recommendation to consume at least 5 portions of fruit and vegetables a day may be beneficial for mental health.¹²

A review of 17 studies found an association between higher fruit and vegetable intake and better mental health in adolescents. The components of mental health assessed included health-related quality of life, mental health status, happiness and self-esteem as well as anxiety, stress and distress and depressive symptoms.¹³

For vegetables specifically, people enjoying higher amounts of vegetables had an 18% lower risk of experiencing symptoms of depression.¹⁴ Other researchers found the days when more vegetables are eaten means enhanced psychological wellbeing.¹⁵ On days when individuals consumed 0.15 more portions of vegetables (and 0.11 more portions of fruit), they experienced higher positive affect, which included feeling calmer, happier, and more energetic.^{16,17} Now wouldn't we all like to feel that and all it takes is a few more bites of fruit and vegetables each day.

A worksite health promotion initiative that encouraged employees to eat a healthy vegetable-based diet resulted in significant improvements in their sleep quality, quality of life, and depressive symptoms. They were given the acronym 'G-BOMBS +T' to remind them what to eat, and the letters stood for **G**reens - **B**eans, **O**nions, **M**ushrooms, **B**erries, **S**eeds and nuts + **T**omatoes.¹⁸
Gotta love a good acronym that reminds you to eat tomatoes!

So get slicing and dicing and adding tomatoes to salads, sandwiches, soups, salsa and bruschetta. Their sweet, acidic flavour pairs perfectly with avocado, eggplant, basil, cheese, garlic, red onion and surprisingly strawberry with balsamic vinegar!

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SEARCH TERMS USED FOR PUBMED: Tomato or *Lycopersicon esculentum* and mood / brain / lycopene

67. TOMATO (CANNED) A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Tomatoes can-do! Vitamin C in canned tomatoes give you the can-do 'tude.
- Antioxidants in canned tomatoes helps the brain to think and feel good.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/Aussie canned tomatoes.

Canned Tomato:

- ✓ Source of vitamin C – psychological wellbeing
- ✓ Contains polyphenols – brain maintenance
- ✓ Contains carotenoids – antioxidant protection

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Canned Tomato fun facts:

- Tomatoes originated in South America and were first cultivated by the Aztecs.¹
- Did you know tomatoes are botanically a berry?¹
- Tomatoes are a source of *umami* (savory) flavour making them excellent in cooking.
- Canned tomatoes are rich in a red coloured carotenoid called lycopene which supports prostate health in men.²
- Cooking releases more of the phytochemicals from within tomatoes, so lycopene levels are higher in canned tomatoes.³
- Tomatoes are popular in Mediterranean cuisines, especially Italian in pasta sauces and pizza topping.

NUTRITION INFORMATION

Serving size: 75g (1/4 cup, canned, drained)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	71g		94g
Energy	66kJ	1%	88kJ
Protein	0.6g	1%	0.8g
Total fat	0.2g	<1%	0.3g
Saturated fat	0g	0%	0g
Total Carbohydrates	2.3g	<	3g
Sugars	2.3g	3%	3g
Sodium	65mg	3%	86mg
Vitamin C	7.5mg	19%	10mg
Total polyphenols^	133mg GAE		177mg GAE
Beta-carotene	295ug		393ug
Lycopene^	1900ug		2540ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

References for website:

- 1 <https://en.wikipedia.org/wiki/Tomato>
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NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR CANNED TOMATOES

Individual consumer friendly nutrient content and permitted general level health claims:

- A 1/4 cup of canned tomatoes (75g) contains 19% of the daily recommended amount of Vitamin C. Vitamin C is important for psychological wellbeing.
- Canned tomatoes are packed with colourful carotenoids (lycopene and beta-carotene) antioxidants to help protect the brain from oxidative stress.
- Canned tomatoes (75g) contain 133mg antioxidant polyphenols that dampen oxidative stress in body cells.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as canned tomatoes, as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of vegetables, such as canned tomatoes, is good for brightening your mood, brain function, psychological wellbeing and happiness.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 75g (1/4 cup, canned, drained)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	71g		94g
Energy	66kJ	1%	88kJ
Protein	0.6g	1%	0.8g
Total fat	0.2g	<1%	0.3g
Saturated fat	0g	0%	0g
Total Carbohydrates	2.3g	<	3g
Sugars	2.3g	3%	3g
Sodium	65mg	3%	86mg
Vitamin C	7.5mg	19%	10mg
Total polyphenols^	133mg GAE		177mg GAE
Beta-carotene	295ug		393ug
Lycopene^	1900ug		2540ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

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Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Canned tomatoes are tomatoes picked at their peak, cooked in the can and then sealed to lock in the goodness until you're ready to use them. They provide endless possibilities for the home cook and a bounty of health benefits as well.

Interesting compounds in canned tomatoes

Tomatoes are well known for containing the red pigment carotenoid lycopene. What is perhaps less well known is that canned tomatoes contain higher levels than fresh tomato because cooking (and chopping) releases more lycopene and other phytochemicals from within the fruit.¹ Cooking tomatoes with olive oil adds further benefit as it increases the absorption of lycopene into the body.² The Mediterranean region knew all along why tomato and extra virgin olive oil go so well together!

Brain benefits of canned tomatoes

Lycopene has numerous health benefits in heart health however lycopene has also shown helpful effects on the central nervous system including on depression. In animal studies lycopene has improved memory and cognition. Lycopene is thought to have these positive effects on the nervous system through inhibiting oxidative stress and inflammation and preserving nerve cells.³

Vegetables in general for a good mood

For vegetables specifically, people enjoying higher amounts of vegetables had an 18% lower risk of experiencing symptoms of depression.⁴ Other researchers found the days when more vegetables are eaten means enhanced psychological wellbeing.⁵ On days when individuals consumed 0.15 more portions of vegetables (and 0.11 more portions of fruit), they experienced higher positive affect, which included feeling calmer, happier, and more energetic.^{6,7} Now wouldn't we all like to feel that and all it takes is a few more bites of fruit and vegetables each day.

A worksite health promotion initiative that encouraged employees to eat a healthy vegetable-based diet resulted in significant improvements in their sleep quality, quality of life, and depressive symptoms. They were given the acronym 'G-BOMBS +T' to remind them what to eat, and the letters stood for **G**reens - **B**eans, **O**nions, **M**ushrooms, **B**erries, **S**eeds and nuts + **T**omatoes.⁸ Gotta love a good acronym that reminds you to eat tomatoes!

How cooking with canned tomatoes can help your mood

Italian cuisine is loved throughout the world and tomatoes feature prominently. Bottling tomatoes at home is a traditional way of preserving a bumper crop and this is a social activity in Italy. Home gardeners in Australia have also embraced preserving, including tomato bottling parties in which everyone pitches in and gets to take home the spoils from their bumper crop. If you can't experience the happiness this brings yourself, the next best thing is cooking with canned tomatoes. Italian cuisine is a winner with most – spaghetti bolognese is the family favourite. In a survey of 25,000 people in 24 countries found pizza and pasta are among the most popular foods in the world and Italian cuisine was the most well-liked.⁹ Cooking itself can promote positive mood and self-confidence.¹⁰ A survey of nearly 1500 people found cooking a meal is an enjoyable and satisfying experience that benefits the whole family.¹¹

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SEARCH TERMS USED FOR PUBMED: Tomato or *Lycopersicon esculentum* or processed tomato and review and diet and [mood/ brain / antioxidants / inflammation]

68. WALNUT A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Walnuts – the ultimate brain food – looks like a brain and good for the brain – contains biotin for a psychological wellbeing.
- Brain-boosting walnuts with niacin for mind and mood.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie walnuts.

Walnut:

- ✓ Source of biotin – mood booster
- ✓ Source of niacin – strong mind, healthy brain
- ✓ Source of folate – psychological wellbeing
- ✓ Source of manganese – energy production
- ✓ Source of copper – brain health
- ✓ Source of magnesium - combats fatigue
- ✓ Contains polyphenol – antioxidant protection
- ✓ Contains melatonin - antioxidant action

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Walnut fun facts:

- Walnuts are one of the highest plant sources of plant omega 3s – alpha linolenic acid.
- Walnuts are heart-healthy nuts.¹
- The Romans called walnuts *Juglans regia*, “Jupiter’s royal acorn”.
- Add to banana bread, carrot cakes and zucchini loafs.
- Combined walnuts with basil, garlic, olive oil and parmesan cheese for a twist on pesto.

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1. Guasch-Ferré M, Li J, Hu FB, Salas-Salvadó J, Tobias DK. Effects of walnut consumption on blood lipids and other cardiovascular risk factors: an updated meta-analysis and systematic review of controlled trials. *Am J Clin Nutr*. 2018;108(1):174-187. doi:10.1093/ajcn/nqy091 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6862936/>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Reiter RJ, Manchester LC, Tan DX. Melatonin in walnuts: influence on levels of melatonin and total antioxidant capacity of blood. *Nutrition*. 2005;21(9):920-924. doi:10.1016/j.nut.2005.02.005 <https://pubmed.ncbi.nlm.nih.gov/15979282/>

NUTRITION INFORMATION

Serving size: 30g (10 whole walnuts raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	1g		3g
Energy	871kJ	10%	2900kJ
Protein	4.3g	9%	14.4g
Total fat	20.8g	30%	69.2g
Saturated fat	1.3g	6%	4.4g
Monounsaturated fat	3.6g		12.1g
Polyunsaturated fat	15g		49.6g
Alpha Linolenic Acid (ALA)	1.88g		6.28g
Total Carbohydrates	0.9g	<1%	3g
Sugars	0.8g	1%	2.7g
Sodium	0.9mg	<1%	3mg
Niacin eq	1.5mg	15%	5mg
Folate eq	21ug	11%	70ug
Biotin	5.7ug	19%	19ug
Copper	0.4mg	14%	1.4mg
Magnesium	45mg	14%	150mg
Manganese	1mg	19%	3.2mg
Total polyphenols^	467mg GAE		1560mg GAE
Melatonin mg^^	0.11ug		0.35ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

“<” means less than

GAE means Gallic Acid Equivalents

SUBSTANTIATION FOR WALNUT

Individual consumer friendly nutrient content and permitted general level health claims:

- Walnuts – the ultimate brain food – looks like a brain and good for the brain – contains biotin for a psychological wellbeing. Ten walnuts contain 19% RDI for biotin.
- Brain boosting walnuts with niacin for strong minds, healthy brains. A 30g handful delivers 15% of the RDI for niacin. Niacin is needed for a normal psychological function and helps overcome tiredness and fatigue.
- Half a cup of walnuts provides friendly folate – 21ug or 11% of the RDI required for psychological wellbeing.
- Snack on walnuts for manganese and get an energy boost with 19% RDI. Manganese helps the body's energy factories.
- The brain needs copper for normal neurological function lucky 10 walnuts has 14% RDI for copper.
- Walnuts are a source of mighty magnesium –it helps combat fatigue – a 30g handful has 45mg of magnesium (14% RDI).
- Walnuts contains 467mg of polyphenols in a serve for antioxidant protection.
- Walnuts contains antioxidant melatonin – with 0.11ug in a 30g serve.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Subcategory NUT claim:

- Nuts: Happiness in a handful. A healthy, varied diet containing a variety of nuts such as walnuts is good for brain function and psychological wellbeing – putting you in happy mood.

(Substantiated by the evidence below and the appendices)

NUTRITION INFORMATION

Serving size: 30g (10 whole walnuts raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	1g		3g
Energy	871kJ	10%	2900kJ
Protein	4.3g	9%	14.4g
Total fat	20.8g	30%	69.2g
Saturated fat	1.3g	6%	4.4g
Monounsaturated fat	3.6g		12.1g
Polyunsaturated fat	15g		49.6g
Alpha Linolenic Acid (ALA)	1.88g		6.28g
Total Carbohydrates	0.9g	<1%	3g
Sugars	0.8g	1%	2.7g
Sodium	0.9mg	<1%	3mg
Niacin eq	1.5mg	15%	5mg
Folate eq	21ug	11%	70ug
Biotin	5.7ug	19%	19ug
Copper	0.4mg	14%	1.4mg
Magnesium	45mg	14%	150mg
Manganese	1mg	19%	3.2mg
Total polyphenols^	467mg GAE		1560mg GAE
Melatonin mg^^	0.11ug		0.35ug

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Walnuts are the ultimate brain food – they look like a brain and they're good for the brain. Walnuts contain a number of potentially neuroprotective nutrients like folate, biotin, niacin, melatonin, several antioxidant polyphenols and significant amounts of plant omega 3s - alpha-linolenic acid (ALA).

Walnuts and mood

Walnut consumption is linked with reduced depression and a more positive outlook. The US National Health and Nutrition Examination Survey (NHANES) collected adult dietary and depression score data from 2005-2014. A total of 26,656 adults reported eating walnuts. Walnut consumers showed significantly lower depression scores (26% lower) compared to non-nut consumers. Walnut

consumers also reported greater interest in doing things, less hopelessness, and feeling more energetic than non-nut consumers.¹

Another study sought to determine the effect of walnuts on mood in 64 healthy volunteers. They were randomly assigned to two treatment sequences: walnut-placebo or placebo-walnut. At baseline mood was assessed using Profiles of Mood States (POMS) survey. Data was collected again after eight weeks. No significant changes in mood were observed in the analyses with both genders combined and in females. However, there was a significant improvement in the Total Mood Disturbance score (-27.49%) in males. In non-depressed healthy young males, walnuts seem to have the ability to improve mood.² The same researchers also reported no significant increases were detected for mood, non-verbal reasoning or memory on the walnut-supplemented diet for all adults. However, inferential verbal reasoning skills increased significantly by 11.2%.³

Walnut and cognition

Like that above further research has suggested an association of walnut consumption with better cognitive performance and improvement in memory. For instance 636 older adults (63-79years/ 68% women) consumed a diet with 30-60g of walnuts a day or a control diet with no walnuts - for two years. The walnut diet had no effect on cognition. However, brain MRIs suggested that walnuts might delay cognitive decline in those at higher risk.⁴

This evidence is supported by animal studies identifying how walnuts have this effect on the brain. For instance in mice with Alzheimer's Disease receiving the diets with 6% or 9% walnuts showed a significant improvement in memory, learning ability, anxiety, and motor development compared to those on the control diet without walnuts.⁵ Walnuts are one of the richest plant sources of the omega 3 Alpha Linolenic Acid (ALA) and a rat study saw improved learning and memory with diets rich in ALA.⁶ Walnuts antioxidant compounds also act as anti-inflammatories in the brain, reducing oxidative damage and potentially protecting against Alzheimer's Disease.^{7,8} Nuts may also keep energy levels up in memory brain cells⁹ thus protecting memories^{10,11}.

Walnuts, antioxidants and inflammation

With their antioxidants, walnuts are able to reduce oxidative stress in brain cells.¹²⁻¹⁴ A diet with walnuts can reduce oxidative stress by decreasing the generation of free radicals and by boosting antioxidant defence, thus resulting in decreased oxidative damage to lipids and proteins.¹² These compounds not only reduce the oxidant and inflammatory load on brain cells but also improve signalling between nerve cells, generate new nerve cells, and reduce the accumulation of toxic proteins.¹³

Walnuts contain melatonin (about 0.35ug/100g) and, while melatonin may help you recovery from jetlag, it also boosts the body's antioxidant levels.¹⁵ Walnuts also contain serotonin¹⁶ and these compounds contribute to walnut's benefits on mood.

Walnuts and stress

Walnuts can help the body withstand stress. Cardiovascular responses to sudden stress were assessed in 20 people who ate a typical diet with and without walnuts. Better blood flow and blood pressure was evident at rest and during stress tests with walnuts.¹⁷

Walnuts and gut bacteria

Walnut consumption can affect the population of gut bacteria^{18,19} which in turn can impact brain function. For instance a study where 18 healthy men and women ate diets containing no walnuts or 42g walnuts a day (for two 3-week periods). Faecal samples saw an increase the abundance of a number of bacterial types, specifically butyrate-producing Firmicutes species.¹⁸ Butyrate can affect brain function.

Walnuts and Mediterranean diet

The Mediterranean diet is renowned for its nutrient-rich, antioxidant-rich foods and its positive effect on health. Researchers are uncovering this traditional diets' secrets such as the PREDIMED Mediterranean diet study. Just under 7,500 participants assessed for nearly 5 years found those following a Mediterranean diet plus a daily 30g of nuts (15g walnuts, 7.5g almonds, 7.5g hazelnuts) had a 22% reduced risk of depression compared to those following a reduced fat diet. When only those with type 2 diabetes were assessed (nearly half the group) they had a 30% reduced risk.²⁰

A subgroup of 522 elderly people in the PREDIMED study eating a Mediterranean diet with nuts every day had improved cognitive performance after 6.5 years compared to those following a reduced fat diet.²¹

So next time you're enjoying a handful of walnuts appreciate them not only because they look like brain but because they are the ultimate brain food. Providing you with a range of nutrients and antioxidants the brain needs for a positive mood and a sharp brain function.

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

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SEARCH TERMS USED FOR PUBMED: Walnut and/or *Juglans regia* and review and diet and [mood/ psychological wellbeing/ optimism/ brain/ cognition/ melatonin]



69. WATERMELON A GOOD MOOD FOOD

WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Watermelon energy for your lethargy. Natural fruit sugar energy source.
- You'll feel one in a melon with watermelon thanks to natural fruit sugars for energy.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie watermelon.

Watermelon:

- ✓ Contains natural fruit sugars – energy source
- ✓ Source of vitamin C – source of happiness
- ✓ Contains polyphenols – natural antioxidant
- ✓ Contains colourful beta-carotene – antioxidant protection
- ✓ Contains colourful lycopene – antioxidant defence
- ✓ Contains fluids – helps hydration

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Watermelon fun facts:

- Watermelons are grown throughout Australia and are available all year round. How lucky are we Aussies!
- Did you know the watermelon rinds are also edible? In China, the rinds are often stir-fried or stewed, and in the Middle East, the seeds are dried and roasted to make a light, easy snack.
- Watermelon is such a versatile culinary ingredient and not only for sweet dishes. In Israel and Egypt, it is common to serve watermelon with feta cheese.
- There are 1200 varieties of watermelon! From seedless and mini to tallow and orange too. Seedless watermelons are the result of a natural hybridization process¹, where farmers cross breed two different fruit varieties.
- Watermelons contain high levels of red coloured lycopene antioxidant. The 'redder' the melon the more lycopene the watermelon contains.²

NUTRITION INFORMATION

Serving size: 150g (1 cup diced raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	138g		92g
Energy	200kJ	2%	133kJ
Protein	0.9g	2%	0.6g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	11.0g	4%	7.3g
Sugars	10.5g	12%	7.0g
Dietary fibre	0.6g	2%	0.4g
Sodium	4.5mg	<1%	3.0mg
Vitamin C	6mg	15%	4mg
Total polyphenols^	89mg GAE		59mg GAE
Beta-carotene eq	435ug		290ug
Lycopene^	6800ug		4530ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SUBSTANTIATION FOR WATERMELON

Individual consumer friendly nutrient content and permitted general level health claims:

- Watermelon for energy to get over your lethargy. They're a source of energy from natural fruit sugars (11g per cup diced).
- Enjoy a happiness boost from one cup of diced watermelon which provides 15% of daily vitamin C needs. Vitamin C contributes to psychological wellbeing.
- Watermelons are a natural source of polyphenol antioxidants. One serve contains 89mg to protect body cells.
- Beta-carotene is an orange pigment antioxidant that fights free radicals – get more than 400ug in a cup of watermelon.
- What makes watermelon red? Lycopene – another pigment antioxidant with just under 6800ug per 150g serve.
- They're called "water" melons for a reason. Being 92% fluids they're a perfect refresher on hot summer day – contributing fluids to body hydration.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit such as watermelon, vegetables, nuts and mushrooms is good for mental health, psychological wellbeing and mood

Subcategory FRUIT claim:

- A healthy, varied diet high in colourful fruit such as watermelon is good for psychological wellbeing and happiness.
- Are the struggles real? You'll be OK just get FRU-IT.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Chilled watermelon is the most refreshing fruit on a hot summer's day. Deliciously scented and juicy, there is nothing quite as satisfying as biting into this red (or orange or yellow) fruit. And it can help you feel optimistic too, read on to find out how.

Bright red watermelon is a rich natural source of lycopene - a carotenoid of great interest because of its antioxidant capacity and potential health benefits. It is also highly bioavailable – a 19 week study in which 24 people drank a watermelon juice resulted in high levels of lycopene being detected in the blood.¹ There are a number of studies that have shown the protective effect of lycopene against free radical damage.² A systematic review assessing the benefits of lycopene for cognition found a positive association in some studies.³ In one cross-sectional study, low plasma lycopene was correlated with low cognitive performance in a cohort of 589 community-dwelling men and women aged 68–79

NUTRITION INFORMATION

Serving size: 150g (1 cup diced raw)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	138g		92g
Energy	200kJ	2%	133kJ
Protein	0.9g	2%	0.6g
Total fat	0g	0%	0g
Saturated fat	0g	0%	0g
Total Carbohydrates	11.0g	4%	7.3g
Sugars	10.5g	12%	7.0g
Dietary fibre	0.6g	2%	0.4g
Sodium	4.5mg	<1%	3.0mg
Vitamin C	6mg	15%	4mg
Total polyphenols^	89mg GAE		59mg GAE
Beta-carotene eq	435ug		290ug
Lycopene^	6800ug		4530ug

Source: Aust Food Comp Data or ^ USDA data

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

years.⁴ In another study of 193 men and women, aged 45–102 years, placed into ‘high’ or ‘low’ intakes for fruit and vegetables. Participants in the ‘high intake’ group had significantly higher plasma lycopene compared with those in the ‘low intake’ group. Specifically, higher plasma lycopene levels were associated with higher test scores on the Mini-Mental State Examination and other cognitive tests.⁵

A large analysis of 61 different studies found a high intake of fruit and vegetables in adults promotes higher levels of optimism and self-efficacy – confidence in yourself that you can achieve what you set out to. These fruit and veg eaters also had less psychological distress and vagueness. It’s clear fruit and vegetables have a positive influence on mental health so enjoy watermelon as part of the 5 portions of fruit and vegetables recommended a day.⁶

An Australian study assessing the food diaries of 12,385 Australian adults found if you ate higher intakes of fruit and vegetable you were more likely to be happier and have more life satisfaction and wellbeing. Just looking at those eating the highest amount of fruit and vegetables (8 portions a day) over a two year period their increase in life satisfaction was equal to the mood boost you would get if moving from unemployment to employment.⁷

These fruitful benefits can also have a huge impact in young people. Young adults eating a loads of fruit and vegetables were more likely to have a greater “eudaemonic” wellbeing. You day what? Eudaemonic (pronounced you–day-mon-ic) is a state of “flourishing” – feeling engaged, having meaning, being curious and creative and having purpose in life. They also had more intense feelings of curiosity and greater creativity. On days they ate more fruit and vegetables they reported greater wellbeing, curiosity and creativity compared to days they ate less fruit and veg.⁸

With its sweet flavour, soft-crunchy and juicy texture watermelon is the perfect way to refresh mind and body.

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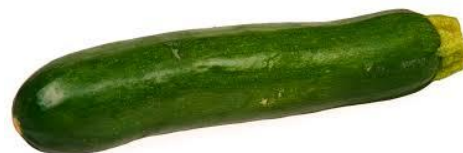
NIP nutrient composition database references

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

SEARCH TERMS USED FOR PUBMED: Watermelon and *Citrullus lanatus* (Thunb.) Mansf and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

70. ZUCCHINI A GOOD MOOD FOOD



WEBSITE COPY

Consumer friendly inspirational key nutrition messages:

- Zucchini for tranquillity: Care for your mind and mood with vitamin C-rich zucchini.
- Colourful carotenoids in zucchini de-stress your brain.
- Antioxidant polyphenols in zucchini provide cell defence against free radicals.

Campaign taglines:

- Eat on the bright side. Naturally boost your mood with Australian/ Aussie zucchinis.

Zucchini:

- ✓ Rich in vitamin C – psychological wellbeing
- ✓ Contains beta-carotene – antioxidant protection
- ✓ Contains polyphenols – antioxidant defence

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Zucchini fun facts:

- Zucchini is another 'fregetable'; botanically a fruit that we eat as a vegetable.
- Zucchini is a variety of summer squash and are called courgettes in the United Kingdom. "Zucchini" means small squash in Italian.¹
- While squash was brought to the Mediterranean region by Christopher Columbus 500 years ago, modern zucchini was developed in Northern Italy in the late 1900s.¹
- Did you know the zucchini flower is also edible? In Italy they are traditionally stuffed with ricotta and parmesan, coated in flour and deep fried in extra virgin olive oil. Yum!
- Zucchini can be eaten raw in salads or steamed, grilled, roasted or stir-fried. "Zoodles" are noodles made from zucchini pushed through a spiraliser. You can even add zucchini to sweet baked treats such as cakes, loaves and brownies.
- A quick and easy idea with zucchini is to slice it lengthwise into quarters, drizzle with extra virgin olive oil, sprinkle with parmesan and bake until golden.

NUTRITION INFORMATION

Serving size: 75g (1/2 small, boiled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	71g		94g
Energy	58kJ	1%	77kJ
Protein	0.8g	2%	1.1g
Total fat	0.3g	<1%	0.4g
Saturated fat	0g	0%	0g
Total Carbohydrates	1.5g	<1%	2g
Sugars	0g	0%	0g
Sodium	0.8mg	<1%	1mg
Vitamin C	15.8mg	39%	21mg
Polyphenols^^	23mg		30mg
Beta-carotene eq	224ug		298ug

Source: Aust Food Comp Data or ^ USDA

^^ Phenol explorer database

*based on an average adult diet of 8700 kJ

"<" = less than

References for website:

1. <http://justfunfacts.com/interesting-facts-about-zucchini/>

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL <https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^ Phenol explorer. Database on polyphenol content in foods. Available at <http://phenol-explorer.eu/contents/food/502>

SUBSTANTIATION FOR ZUCCHINI

Individual consumer friendly nutrient content and permitted general level health claims:

- Half a small cooked zucchini provides 39% of the daily recommended amount of vitamin C. Vitamin C is needed for maintaining both psychological function and nervous system function, for overall psychological wellbeing.
- A serve of cooked zucchini (75g) contain 224ug of the antioxidant pigment beta-carotene – contributing to their bright skin colour. Carotenoids calm oxidative stress in the body and brain.
- The 23mg of antioxidant polyphenols in ½ a cooked zucchini fights free radicals.

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category FRUIT and/or VEGETABLE and/or NUT claim:

- A healthy, varied diet rich in fruit, vegetables such as zucchini, as well as nuts and mushrooms is good for mental health, psychological wellbeing and mood.

Subcategory VEGETABLE claim:

- A healthy, varied diet with a variety of colourful vegetables, such as zucchini, is good for brightening your mood, brain function, psychological wellbeing and happiness.

(Substantiated by the evidence below and the appendices)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Even the name will tickle your funny bone, but there's more to zucchini than just a funny name to lift your spirits.

The good stuff in zucchinis

The health benefits of fruit and vegetables such as zucchini on psychological wellbeing are due to the many phytochemicals, antioxidants and other nutrients present that ensure a healthy brain function.¹ Zucchini is vitamin C-rich and contains beta-carotene which are important in the antioxidant defence of cells. Having higher intakes of these nutrients is associated with better cognitive function in older people and the association is stronger for food sources than supplements.² It's also more enjoyable to gain your antioxidant defence from zucchini than popping a pill! Zucchini also contain anti-inflammatory components including polyphenols, beta-carotene and fibre. A review of studies on the nutritional quality of the diet and depression risk found those with a low dietary inflammatory index had a 19% lower risk of depressive symptoms.³

NUTRITION INFORMATION

Serving size: 75g (1/2 small, boiled)

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	71g		94g
Energy	58kJ	1%	77kJ
Protein	0.8g	2%	1.1g
Total fat	0.3g	<1%	0.4g
Saturated fat	0g	0%	0g
Total Carbohydrates	1.5g	<1%	2g
Sugars	0g	0%	0g
Sodium	0.8mg	<1%	1mg
Vitamin C	15.8mg	39%	21mg
Polyphenols^^	23mg		30mg
Beta-carotene eq	224ug		298ug

Source: Aust Food Comp Data or ^ USDA

^^ Phenol explorer database

*based on an average adult diet of 8700 kJ

"<" = less than

Eating vegetables and mood

There is now good evidence that higher fruit and vegetable intake is related to better mental health. Research has established that people who eat more fruit and vegetables have a lower incidence of mental disorders, including lower rates of depression, perceived stress, and negative mood.⁴ Eating fruit and vegetables is not only good for mental health but also for a more positive outlook on life. A population study in France of nearly 33,000 people found optimism was associated with overall diet quality and higher consumption of fruit and vegetables and nuts.⁵ A study of nearly 9,000 adults in Finland found eating fresh vegetables and salads, salad dressing, berries and fruit was associated with a more optimistic outlook on life.⁶

Cooking vegetables gives confidence too

A systematic review of 11 studies suggests that cooking interventions may positively influence psychosocial outcomes. Cooking interventions resulted in positive influences on socialisation, self-esteem and quality of life. Cooking requires integration of cognitive, physical, and socio-emotional processes. And learning to cook specifically involves the mastery of skills, which might explain why cooking can promote positive mood, self-confidence, and self-esteem.⁷ A population-based survey of 8,500 adolescents in New Zealand, found self-reported cooking ability was positively associated with better family connections and greater mental wellbeing.⁸

Grow them yourself to further boost your mood

Growing zucchinis is great fun and they do well in temperate climate areas. Be prepared for a bumper crop and start researching recipes as they are well known for being very productive kitchen garden plants. As well as gaining the mood boosting benefits of eating zucchinis, growing them in the garden is a great way to manage stress. One study found vegetable gardening increased a brain chemical called BDNF associated with lower risk of depression.⁹

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^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^ Phenol explorer. Database on polyphenol content in foods. Available at <http://phenol-explorer.eu/contents/food/502>

SEARCH TERMS USED FOR PUBMED: Zucchini OR *Cucurbita pepo* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

Appendix 1 Good Mood Food Project Methodology

STEP 1: DETERMINATION OF COMMODITIES, SERVING SIZES AND FORM OF FOOD

Working with Hort Innovation a list of 70 commodities from 37 Australian levy paying industries was developed as below. If an industry had already derived their own preferred serving size this was used to calculate nutrient content claims to ensure consistency. For industries where this was not the case the serving sizes listed in the Australian Dietary Guidelines were used:

- Fruit 150g (1 medium piece, 2 small pieces, 1 cup diced)
- Vegetables 75g (1/2 cup cooked or 1 cup leaves)
- Nuts 30g
- Dried fruit 30g

In some cases common sense was applied where 150g was unrealistic e.g. lemons/limes/passionfruit and 100g was chosen as a realistic serving size.

Hort Innovation provided a list of the 20 most commonly purchased vegetables in Australia.

Commodity	Serving size (Household measure)
Almond	30g (industry) (20almonds)
Apple	150g (1 small apple)
Apricot fresh	150g (2 apricots)
Apricot dried	30g (4 dried apricot halves)
Avocado	50g (industry) (1/4 large or 1/3 of a small)
Banana	150g (1 medium banana)
Beetroot	75g (1/2 cup cooked)
Blackberry	125g (industry) (1 punnet)
Blueberry	125g (industry) (1punnet)
Bok choy	75g (1/2 cup cooked)
Broccoli	75g (1/2 cup cooked)
Cabbage	75g (1/2 cup cooked)
Capsicum (red)	75g (1/3 capsicum raw)
Carrot	75g (1/2 large carrot)
Cauliflower	75g (1/2 cup cooked)
Celery	75g (2 stalks)
Cherry	150g (1cup pitted)
Chestnut	30g (industry) (4 whole)
Cucumber	75g (1/2 small raw)
Currant dried	30g (1.5 tb)
Custard apple	150g (1/3 custard apple)
Eggplant	75g (1/2 cup cooked)
English spinach	75g (1 cup leaves)
Grapefruit	150g (1/2 grapefruit)
Green beans	75g (1/2 cup cooked)
Green peas	75g (1/2 cup cooked)
Hazelnut	30g (industry) (20 hazelnuts)
Honeydew	150g (3/4 cup)
Kale	75g (1 cup leaves)
Leek	75g (1/2 cup cooked)
Lemon	100g (1 lemon)
Lime	100g (2 limes)

Commodity	Serving size (Household measure)
Lychee	100g (industry) (8 lychee)
Macadamia	30g (industry) (15macadamias)
Mandarin	150g (2 small mandarin)
Mango	150g (1/2 mango)
Mushroom	100g (industry) (3 cup-type mushroom)
Nashi	150g (1 small nashi)
Nectarine	150g (1 nectarine)
Olive	40g (1/2 cup olives)
Olive oil	15ml (3 tsp)
Onion	75g (industry) (1/2 onion)
Orange	150g (1 medium orange)
Orange juice	125ml (1/2 cup)
Papaya (paw paw)	150g (1 cup diced)
Passionfruit	40g (2 passionfruit)
Peach	150g (1 peach)
Pear	150g (1 small pear)
Pecan	30g (industry) (15 pecans)
Persimmon	150g (2 persimmon)
Pineapple	165g (industry) (1 cup diced/ 2 sl)
Pistachio	30g (industry) (30 kernels)
Plum	150g (2 small plum)
Potato, fresh	150g (industry) (1 medium cooked)
Pumpkin	75g (1/2 cup cooked)
Prune	50g (industry) (6 prunes)
Raisin	30g (1.5 tb)
Raspberry	125g (industry) (1punnet)
Rockmelon	150g (1 cup diced)
Silverbeet	75g (1/2 cup cooked)
Strawberry	150g (1 cup whole strawberries)
Sultana	30g (1.5 tb)
Sweet corn	75g (1/2 ear cooked)
Sweet potato	150g (industry) (1/2 sweet potato cooked)

Commodity	Serving size (Household measure)
Table Grape	150g (1 cup)
Tomato fresh	75g (1/2 medium tomato)
Tomato canned	75g (1/4 cup)
Walnut	30g (industry) (10 walnuts)
Watermelon	150g (1 cup diced)
Zucchini	75g (1/2 cup cooked)

For the form of the food it was also decided to use raw produce in most cases except if the commodity must be, or is usually eaten, cooked.

If a commodity was deemed to be “cooked” an entry was chosen from the nutritional composition databases for a cooking method that did not include any other ingredients e.g. baking, boiling, microwaving and stir frying.

Hort Innovation also requested we include in the nutrition composition excel sheet (see Step 4), the year the nutritional analysis for each commodity was undertaken to identify how old the data is.

STEP 3 DETERMINATION OF NUTRIENTS TO SUPPORT THE GOOD MOOD FOOD PROPOSITION

By reviewing the pre-approved general level health claims in Schedule 4 of the Food Standard Code (FSC), a list of nutrients with functions that would help substantiate the Good Mood Food proposition were identified. Those nutrients and their appropriate functions are listed below:

Nutrients	Nutrient function supporting Good Mood Food proposition
Energy (kJ) (incl fibre)	energy vitality
Carbohydrates (g) (incl sugar alcohols)	contributes energy for normal metabolism
Sugars (g)	source of energy (note there is no source of sugars claim in Schedule 4)
Dietary Fibre (g)	gut health (consider gut bacteria gut brain axis however not an approved GLHC)
Potassium (mg)	normal function of nervous system
Thiamin (mg)	normal neurological and psychological function, contributes to normal energy production
Riboflavin (mg)	reduction of tiredness and fatigue, contributes to normal energy production
Niacin eq (mg)	normal neurological, psychological function and reduction of tiredness and fatigue, contributes to normal energy production
Pantothenic acid (mg)	normal mental performance and reduction of tiredness and fatigue, contributes to normal energy production
Vitamin B6 (mg)	normal psychological function and reduction of tiredness and fatigue, contributes to normal energy metabolism
Vitamin B12 (ug)	normal neurological, psychological function and reduction of tiredness and fatigue, contributes to normal energy production
Folate eq (ug)	normal psychological function and reduction of tiredness and fatigue
Biotin (ug)	normal psychological function, normal macronutrient metabolism
Vitamin C (mg)	normal neurological and psychological function and reduction of tiredness and fatigue, contributes to normal energy metabolism
Vitamin E mg	antioxidant - protect cells from free radical damage
Calcium (mg)	normal nerve function, contributes to normal energy metabolism
Copper (mg)	normal neurological function, Necessary for normal energy production
Iodine (ug)	normal neurological and cognitive function, Necessary for normal energy metabolism
Iron (mg)	normal cognitive function and reduction of tiredness and fatigue, contributes to normal energy production
Magnesium (mg)	normal psychological and nerve function and reduction of tiredness and fatigue, contributes to normal energy metabolism
Zinc (mg)	normal cognitive function, contributes to normal macronutrient metabolism
Manganese (mg)	contributes to normal energy metabolism, antioxidant mineral
OTHER NUTRIENTS/ BIOACTIVES	The following GLHCs are not in the FSC
Moisture (g)	dehydration and effect on mental performance
Total polyphenols (mgGAE) (USDA)	antioxidant - protect cells from free radical damage
Beta-carotene eq (ug) (AFCD)	evidence of beta carotene and memory brain health, antioxidant
Lycopene ug (USDA)	antioxidant - protect cells from free radical damage
Anthocyanins mg (USDA)	evidence of anthocyanins and brain health cognition, antioxidant
Quercetin mg	antioxidant - protect cells from free radical damage
Fructans g	prebiotic fibre
Glycemic Index	longer lasting energy/ sustained energy
Sorbitol (mg)	laxative effect in excess
Total fat (g)	healthy fats effects for nuts/ olive/ olive oil/ avocado

Saturated fat (g)	Low in saturated fat for heart health
Monounsaturated fats g	heart health
Polyunsaturated fats g	heart health

STEP 4 NUTRITION ANALYSIS EXCEL WORKBOOK

The FSANZ Australian Food Composition Database was used to populate the Nutrition Composition excel workbook with nutrient content per 100g and an amount calculated per serve for all 70 commodities. Where data was missing the USDA database or research papers were utilised.

The amount per serve was then compared to the following criteria to calculate a %RDI or %DI

- FSANZ regulatory RDIs (Schedule 1 of the FSC for vitamins and minerals)
- Standard 1.2.8 for macronutrients to calculate %Daily Intake and
- Any nutrient criteria in Schedule 4 of the FSC.

Short claims were developed where the amounts met the criteria e.g. “source of X” to highlight which nutrients to use.

This information was used to determine which nutrient content and general level health claims could be made, and to populate nutrition information panels (NIPs) for each commodity. All mandatory nutrients were included in the NIPs as well:

- Energy
- Protein
- Total fat
- Saturated fat
- Carbohydrates
- Sugars
- Sodium

Each entry in the Australian Food Composition Database and USDA database has its own code for identification called the Public Food Key or FIC (US). This code was also added into the Excel sheet for each commodity to identify the entry chosen to represent the commodity. This is especially needed when there are several entries e.g. different varieties of a commodity or methods of cooking.

The scientific literature research also identified additional bioactives that may have a brain health function. These were added to the list as noted above. Notes on bioactives in the table are denoted by ^. The reference citation was added to the second worksheet “Key to table”.

Searching the excel spread sheet

Given there are 70 entries in the spread sheet the “Find” function to search for a commodity is useful. On the “Home” tab of excel, go to the very end and click “Find and Select”, then click Find in the drop down box and type in what you are looking for and click “Find Next”.

Columns can also be hidden to bring what you are reviewing closer to column A the names of the nutrients. Simply highlight the column by taking the mouse up to the letter (s) of the column and click this will highlight the column, then right mouse click to open the mouse menu and go down to click “Hide”. “Unhide” is also below it in this menu to unhide any hidden columns.

Useful websites:

AFCD:

<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

Regulatory RDIs <https://www.legislation.gov.au/Series/F2015L00491>

USDA database - <https://fdc.nal.usda.gov/>

STEP 5 ROUNDING OF DATA

Rounding nutrient compositional data

Food Standards Australian New Zealand (FSANZ) does not provide guidance on how many decimal places there should be when adding values to the Nutrition Information Panel.

Standard 1.2.8 Clause 7(3) does indicate that there should be no more than a maximum of three significant figures however does not indicate a minimum.

For example 8750kJ and 8.75mg both have three significant figures.

(Energy in kilojoules is specifically noted to only have three significant figures and hence would need to be rounded up or down).

Schedule 1 lists the Recommended Dietary Intakes (RDIs) for vitamins and minerals and Schedule 4 provides the numerical nutrient criteria that needs to be met in order to make nutrient content claims. These are a good guide for the how FSANZ prefers to list the nutrient values and the number of decimal places.

As directed by Hort Innovation the nutrition information is provided to one decimal place for macronutrients, vitamins and minerals except energy, sodium, potassium, and any bioactive compounds such as antioxidants where whole numbers are used.

The excel sheet use formulas for calculations and one decimal place was chosen for all results for ease so where rounding to a whole number was needed any number 0.5 and above is round up and anything 0.4 and below is round down.

STEP 6 COMMODITY RESEARCH REVIEW

To help support the substantiation of claims a brief desk top literature review was conducted for each commodity using the following basic search terms. If additional search terms were used these are noted at the end of each commodity entry in the final report (above). The scientific name was taken from the Australian Food Composition database entry for each commodity. On the rare occasion this entry may have had an incorrect scientific name – Google was used to confirm scientific names on these occasions.

SEARCH TERMS USED: [Commodity name] AND/OR [*Scientific name*] and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

Databases used included:

- Pubmed
- Google Scholar
- Research Gate
- ProQuest
- Science Direct

STEP 7 CATEGORY AND SUB CATEGORY RESEARCH

An initial cursory glance at the nutrient composition of commodities determined that for some there may not be many nutrients present to support the Good Mood Food proposition. To help support these claims additional research was undertaken for category and subcategories of produce. A brief desk top literature review (Appendix 2-8) was undertaken for the following:

- Category: A healthy diet/ a diet rich in fruit/ vegetables/ nuts/ mushrooms is good for mood/brain health
- Subcategory: A diet rich in **fruit** is good for mood/brain health
- Subcategory: A diet rich in **vegetables/mushrooms** is good for mood/ brain health
- Subcategory: A diet rich in **nuts** is good for mood/ brain health
- Subcategory: A healthy lifestyle including **gardening** (grass/flowers/ trees etc) is good for wellbeing/ brain health/ mental health/ stress management
- Subcategory: **Cooking** at home and eating with family is good for mental health
- Subcategory: Effects on dehydration/ **hydration** on brain function.

These category and subcategory claims were added to each commodity section where appropriate.

Search terms: [insert category/subcategory term] and diet and review and mood and brain function/ stress / relaxation / psychological wellbeing/ happiness/ optimism/ cognition/ mental health/

Where the commodity covers a range of varieties, the search term was confined to the predominant variety available in Australia using the botanical name. For example, the most common mushroom is *agaricus bisporus*. As noted above the scientific/ botanical names were added to the excel spread sheet as found in the Australian Food Composition Database unless incorrect.

Purchasing papers

Where possible papers were located online for free or requests were made of authors. A budget of \$1000 was available to pay for papers but at a cost of UA\$50+ only about 20 papers would be purchased.

If a free full paper was available online a link to the location or pdf has been included in the reference citations for each commodity section.

STEP 8 FUN FACTS

Hort Innovation requested a list of fun facts for each commodity for the website copy. These were a combination of:

- Health related (referenced)
- Historical or did you know
- Occasion of use and/or recipe tip
- Dispelling a myth

Information was source from:

- Individual industry websites
- Wikipedia website
- Just Fun Facts website <http://justfunfacts.com/>
- Google

STEP 9 WRITING UP COMMODITY TEMPLATES AND REPORTS

A template was developed with all the components required to ensure a consistent approach, see page 291. Using the information gathered above the appropriate sections of the template were populated. These were then edited and transferred to the Substantiation Report for the full template and the Consumer Key Message report for just the material to be used for the Good Mood Food website.

A generic photo of the commodity was added to the templates. These were found using Google Images and specifically chosen as they were labelled for reuse with no risk of copyright infringement.

Once the project was completed Hort Innovation were keen to categorise commodities under key nutrient functions for the website so requested a list of two word function themes:

General Level Health Claim (words of similar nature)	Two word summary	One word summary	Nutrients with these benefits
Energy production/ energy metabolism	Energy Producer	Energiser	Fruit sugars, carbs, Low GI carbs, thiamin, niacin, pantothenic acid, vitamin B6, manganese, vitamin B12, biotin, vitamin C, calcium, copper, iron, magnesium, zinc, manganese
General Level Health Claim (words of similar nature)	Two word summary	One word summary	Nutrients with these benefits
Reduction of tiredness and fatigue	Fatigue Fighter		Riboflavin, niacin, pantothenic acid, vitamin B6, vitamin B12, folate, vitamin C, iron, magnesium,
Laxation/ bowel function/ bowel health/ gut function/ gut health	Gut Lover		Fibre
Psychological wellbeing/ psychological function/ mental health/ mental support/ mental performance	Mood Booster		Thiamin, niacin, pantothenic acid, vitamin B6, vitamin B12, folate, biotin, vitamin C, magnesium
Neurological function/ brain function/ brain health/ cognitive function/ cognition	Brain Optimiser		Thiamin, niacin, vitamin B12, vitamin C, copper, iron, zinc,
Cell protection from free radical damage/ Antioxidant protection (e.g. preventing oxidative stress)	Antioxidant Cell Defender Antioxidant Cell Protector Stress Beater	De-stresser	Antioxidants e.g. polyphenols, beta-carotene, lutein zeaxanthin, anthocyanin, lycopene, quercetin, vitamin C, vitamin E, manganese
Nerve function/ nervous system function	Nerve Communicator/Messenger/ Signaller	Signaller	Potassium, calcium, magnesium,
Hydration (although no GLHC for this)	Fluid Balancer	Hydrater	Fluids/ moisture

[INSERT COMMODITY NAME] A GOOD MOOD FOOD

WEBSITE COPY

Consumer friendly inspirational fun key nutrition messages:

[Claim(s) here]

- (one nutrient to a claim, chose nutrient with highest %RDI or bioactive)
- Eat on the bright side. Naturally boost your mood with Australian/ Aussie [commodity name]. (campaign taglines)

[Insert commodity name]:

- ✓ Rich in (OR Bursting with etc) / good source/ source of/ contains [insert nutrient name] – [add in two words what this nutrient does for mood]
- ✓ Rich in/ good source/ source of/ contains [insert nutrient name] – [add in two words what this nutrient does for mood]
- ✓ Rich in/ good source/ source of/ contains [insert nutrient name] – [add in two words what this nutrient does for mood]

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

[Commodity] fun facts:

- XXXX
- 1-2 health related (referenced)
- Historical or did you know
- Occasion of use and/or recipe tip
- Dispel a myth
- (use the industry website for info)

References for website:

- 1 X
- 2 X
- 3 X

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL

NUTRITION INFORMATION

Serving size: Xg [Industry derived/ 150g fruit, 75g veg, 30g nuts/dried fruit] (incl household measure RAW OR HOW COOKED)
REMOVE NUTRIENTS BELOW THAT DON'T MEET CRITERIA

	Av QTY Per serve	%DI*	Av QTY per 100g
Moisture	g		g
Energy	kJ	%	kJ
Protein	g	%	g
Total fat	g	%	g
Saturated fat	g	%	g
Total Carbohydrates	g	%	g
Sugars	g	%	g
Dietary fibre	g	%	g
Sodium	mg	%	mg
Potassium	mg		mg
Thiamin	mg	%	mg
Riboflavin	mg	%	mg
Niacin eq	mg	%	mg
Pantothenic acid	mg	%	mg
Vitamin B6	mg	%	mg
Vitamin B12	ug	%	ug
Folate eq	ug	%	ug
Biotin	ug	%	ug
Vitamin C	mg	%	mg
Vitamin E	mg	%	mg
Calcium	mg	%	mg
Copper	mg	%	mg
Iodine	ug	%	ug
Iron	mg	%	mg
Magnesium	mg	%	mg
Zinc	mg	%	mg
Manganese	mg	%	mg
Total polyphenols^	mg GAE		mg GAE
Beta-carotene eq	ug		ug
Glycemic Index (GI) ^^			
Any other bioactives			

Source: Aust Food Comp Data or ^ USDA

*based on an average adult diet of 8700 kJ

"<" means less than

GAE means Gallic Acid Equivalents

<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem.* 2006;54(11):4069-4075. doi:10.1021/jf060300l
<https://pubmed.ncbi.nlm.nih.gov/16719536/>
 ^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SUBSTANTIATION FOR [COMMODITY NAME]

Individual consumer friendly nutrient content and permitted general level health claims:

- [Include a traditional NCC/GLHC claim on each individual nutrient, consider serve sizes, %RDIs etc].

*When eaten as part of a healthy varied diet.

(This statement needs to appear at the bottom of each commodity webpage)

Category/ Subcategory FRUIT and/or VEGETABLE and/or NUT claim:

- [Include key message from the category/subcategory claims especially if not much below].
- E.g. *Nuts: Happiness in a handful. A healthy, varied diet containing a variety of nuts such as almonds is good for brain function and psychological wellbeing – putting you in happy mood.*

(Substantiated by the evidence below)

Supporting evidence from scientific literature

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Fun introduction sentence

[Summarise research into minimum 2-3 pars with typical reference superscripted numbering]

- Start with any commodity specific mood/ psychological wellbeing research first
- Then cognition/ brain function research
- Then use FVNM/ FRUIT psychological wellbeing research

Fun concluding sentence/ usage idea.

References for substantiation

1 X

NIP nutrient composition database references

FSANZ Australian Food Composition database Release 1.0 (2019) Available at URL
<https://www.foodstandards.gov.au/science/monitoringnutrients/afcd/Pages/foodsearch.aspx>

^USDA FoodData Central Database available at URL <https://fdc.nal.usda.gov/fdc-app.html#/>

^^Wu X, Beecher GR, Holden JM, et al. Concentrations of anthocyanins in common foods in the United States and estimation of normal consumption. *J Agric Food Chem.* 2006;54(11):4069-4075. doi:10.1021/jf060300l
<https://pubmed.ncbi.nlm.nih.gov/16719536/>

^^Glycemic Index database <http://www.glycemicindex.com/foodSearch.php>

SEARCH TERMS USED FOR PUBMED: Commodity name and/or *scientific name* and review and diet and [mood/ psychological wellbeing/ optimism/ brain function/ cognition/]

Appendix 2 - Category claim: Fruit, Vegetables, Nuts, Mushrooms

PLANT FOODS CATEGORY CLAIM (FVNM) GOOD MOOD FOOD

Consumer fun inspirational message

Want your soul to dance? Eat more plants (foods)

- Eat on the Bright side
- Naturally boost your mood with fresh Aussie fruit, veg and nuts.
#GoodMoodFood #vegetables #fruit #nuts #mushrooms

Substantiation

Consumer message (suitable for website)

- Want your soul to dance? Eat more plants (foods)

Formal claim (suitable for website):

A healthy, varied diet rich in fruit, vegetables, nuts and mushrooms is good for brain function, mental health, psychological wellbeing and mood.

Supporting evidence from scientific literature (suitable for website)

Note the following information may mention disease states and hence would not be Food Standard Code compliant and therefore not suitable for branded communications. This information is for educational purposes only.

Fruit, vegetables, nuts and mushrooms add pleasure to a healthy balanced diet. With so many bright colours, delectable tastes, interesting textures and tantalising aromas and scents – the presence of these foods can make a hard day better and a healthy diet more enjoyable.

Experts in the emerging field of nutritional psychiatry have developed dietary recommendations for the prevention of depression. They give, based on the best available current evidence, five key recommendations:

- (1) follow 'traditional' dietary patterns, such as the Mediterranean, Norwegian, or Japanese diet;
- (2) increase consumption of fruit, vegetables, legumes, wholegrain cereals, nuts, and seeds;
- (3) include a high consumption of foods rich in omega-3 polyunsaturated fatty acids;
- (4) replace unhealthy foods with wholesome nutritious foods;
- (5) limit your intake of processed foods, 'fast' foods, commercial bakery goods, and sweets.¹

Fruit and vegetables, mental health, psychological wellbeing and mood

Evidence suggests that the health benefits of fruit, vegetables, nuts and mushrooms on psychological wellbeing are due to the many bioactive compounds working together to deliver a healthy brain function.² Compounds such as phytochemicals and antioxidants, and other nutrients such as vitamins, minerals and fibre.

There is now good evidence that higher fruit and vegetable intake is related to better mental health. Research has established that people who eat more fruit and vegetables have a lower incidence of mental disorders, including lower rates of depression, perceived stress, and negative mood. And they also have a higher likelihood of optimal mental states, such as greater happiness, positive mood, life

satisfaction and social and emotional “flourishing” - feelings of meaning, purpose, and fulfilment in life. The top 10 raw foods related to better mental health included: carrot, banana, apple, dark leafy greens like spinach, grapefruit, lettuce, citrus fruit, fresh berries, cucumber, and kiwifruit.³

It seems an eating pattern with plenty of fruit and vegetables really does help you look on the bright side. A large study of nearly 9,000 **adults** in Finland found eating fresh vegetables and salads, salad dressing, berries and fruit was associated with a more optimistic outlook on life.⁴ A study of 160 **older women** aged 45-60 years in Poland found women who ate raw vegetables, fruit, nuts, plant oils and fruit and vegetable juices more frequently had higher levels of self-efficacy, and those who ate fruit, nuts and fruit juices more frequently had higher levels of optimism and satisfaction with life.⁵ A population study in France of nearly 33,000 people found optimism was associated with overall diet quality and higher consumption of fruit and vegetables and nuts.⁶

A review of 61 studies analysing the association between fruit and vegetable intake and mental health in **adults** found a high total intake of fruit and vegetables (and some of their specific subgroups including berries, citrus, and green leafy vegetables) may promote higher levels of optimism and self-efficacy, reduce levels of psychological distress, and protect against depressive symptoms. The authors concluded that fruit and/or vegetables have a positive influence on mental health and the general recommendation to consume at least 5 portions of fruit and vegetables a day may be beneficial for mental health.⁷

The same can be said for adolescents. A review of 17 studies found an association between higher fruit and vegetable intake and better mental health in **adolescents**. The components of mental health assessed included health-related quality of life, mental health status, happiness and self-esteem as well as anxiety, stress and distress and depressive symptoms. The strongest benefits were found for green vegetables, yellow vegetables and fresh fruit.⁸

A study in **young adults** found higher fruit and vegetable consumption predicted greater eudaemonic wellbeing (a state of “flourishing” characterised by feelings of engagement, meaning, curiosity, creativity and purpose in life), more intense feelings of curiosity and greater creativity. On days they ate more fruit and vegetables they reported greater eudaemonic wellbeing, curiosity and creativity compared to days they ate less.⁹

A study of **young adults** found consuming 7-8 servings of fruit and vegetables predicted greater positive moods such as joy, interest, and alertness on the day they ate them, and the day afterward. The authors concluded eating fruit and vegetables may promote emotional wellbeing in healthy young adults.¹⁰

A study of 80,000 **people** in Britain found happiness and mental health rise with the number of daily portions of fruit and vegetables eaten. The peak in wellbeing came at around 7 portions a day.¹¹

A cross-sectional study observed that **adults** consuming high (nutritional) quality diets had 67% better psychological wellbeing relative to those with low (nutritional) quality diets, and the improvement in wellbeing was only significant for higher serves of fruit and vegetables.¹²

An Australian study assessing food diaries and surveys of 12,385 Australian **adults** found increased fruit and vegetable consumption was predictive of increased happiness, life satisfaction and wellbeing. The increase in life satisfaction from the highest increase in fruit and vegetable consumption (8 portions a day) over the period of two years was equal to the psychological gain of moving from unemployment to employment.¹³

An Australian study of over 60,000 **older adults** (greater than 45 years of age), found Increasing fruit and vegetable consumption may help reduce psychological distress in middle-aged and older adults.¹⁴

The Australian Dietary Guidelines (ADGs) recommend a plant-based diet including vegetables, fruit, and nuts. Australian longitudinal research in **women** has found adherence to the ADGs reduced the risk of developing depressive symptoms over 5 years.¹⁵

A worksite health promotion initiative that encouraged **employees** to eat a healthy vegetable-based diet resulted in significant improvements in their sleep quality, quality of life, and depressive symptoms. They were given the acronym 'G-BOMBS +T' to remind them what to eat, and the letters stood for **G**reens - **B**eans, **O**nions, **M**ushrooms, **B**erries, **S**eeds and nuts + **T**omatoes.¹⁶
Gotta love a good acronym!

Healthy diet recommendations around the world emphasise a diet rich in plant foods including vegetables (mushrooms), fruit and nuts. A Mediterranean diet is characterised by high vegetable, fruit and nut intake. A review of studies examining healthy diets and the risk of depressive outcomes concluded following a healthy diet, in particular a traditional Mediterranean diet, or avoiding a pro-inflammatory diet, appears to protect against depression. The most compelling evidence was found for the Mediterranean diet and depression, with the highest adherence conveying a 33% lower risk.¹⁷

Fruit, vegetables, nuts and brain function, cognition and memory

A review of 22 studies examining fruit, vegetables and 100% fruit/vegetable juice consumption and cognitive function found most studies reported significant benefits. The researchers concluded that fruit, vegetables and 100% juices are beneficial for memory and cognition in **older adults**.¹⁸

A large study of 4,447 **older people** aged over 45 years in the Netherlands found a better-quality diet characterised by high intake of vegetables, fruit, and nuts (as well as wholegrain, dairy and fish) was associated with larger brain volume - a known risk-reduction factor for dementia.¹⁹

Particular fruit such as citrus, grapes and berries may play a role in maintaining brain health and reducing cognitive decline.²⁰

Nuts

Nuts have long been known for their heart health properties but their impacts on the brain have only recently been uncovered. Nuts are associated with improvements in brain health, including better cognitive function, learning, memory and mood.

It's thought that the combination of healthy fats, antioxidant vitamins and minerals, and phytochemicals with antioxidant and anti-inflammatory properties in nuts may help protect vital functions of the brain and its blood vessels.

Studies have found associations between the consumption of nuts with a lower risk of depression²¹, including the SMILES intervention trial with 67 participants. The trial found improvements in ratings of depression after 12 weeks of dietary modification (which included a daily serving of nuts)²².

Nuts contain the amino acid tryptophan a precursor for serotonin – a chemical messenger in the brain - which modulates mood and may help explain these anti-depressive effects.²³ A daily 30g serve of nuts as part of a Mediterranean diet over 3 years also improve levels of brain-derived neurotrophic factor which also influences mood.²⁴

Nuts have also been found to reduce anxiety in men – those eating the most nuts were 66% less anxious than low nut eaters.²⁵

Some nuts such as walnuts, with their striking resemblance to the brain, have been found to reduce depression scores²⁶ and may have a role to play in reducing cognitive decline in susceptible individuals.²⁷ There is much to learn about the role of nuts in maintaining healthy brain function.

For more see the subcategory claim section on nuts following, and the individual nut templates: almond, chestnut, hazelnut, macadamia, pecan, pistachio and walnut.

Mushrooms

Mushrooms are rich in niacin, and a source pantothenic acid and biotin that maintain brain function and reduce fatigue. Mushrooms also have antioxidant properties due to antioxidant vitamins, minerals, carotenoids and polyphenols²⁸, as well as anti-inflammatory effects²⁹. Studies have demonstrated anti-fatigue³⁰ and possible anti-depressant effects³¹ of mushrooms along with possible improvements in memory^{32,33}.

For more see the mushroom template.

How does diet influence depression?

In brief, depression has multiple origins, from social and psychological stress, or from immunological or neurotransmitter (brain messenger chemical) abnormality.

The beneficial effects of diets on depression may be explained by the following three hypotheses:

- (1) Diets with anti-inflammatory properties may reduce inflammation in the brain, thus contributing to relief from depression;
- (2) Diets with antioxidant properties may decrease the oxidative stress in specific brain zones, thus alleviating depressive symptoms; and
- (3) Diets that enhance the ability of brain-derived neurotrophic factor (BDNF) may directly improve mood.³⁴

Fruit and vegetable intake may improve psychological wellbeing through anti-inflammatory and antioxidant mechanisms.

Anti-inflammatory effects

Chronic systemic inflammation is implicated in the development of numerous chronic diseases and adverse mental health outcomes including depression.³⁵ Mood disorders and cardiometabolic disease frequently co-exist and inflammation has been proposed as a mechanism.³⁶

There is evidence that immune processes influence resilience, or the ability for people to adapt to adverse events and recover from them. It is thought that chronic stress prevents the body from switching off the production of inflammatory chemicals, however things that mediate the immune system, such as polyphenols, can influence brain function and behaviour. In this way polyphenols may promote stress resilience.³⁷

The role of inflammation and diet in the development of depression is supported by a large study of almost 50,000 people that found an increased risk of depression in people consuming a pro-inflammatory diet as measured by the Dietary Inflammatory Index (DII).³⁸

Foods and food components with anti-inflammatory scores have been identified: fibre, isoflavones, beta-carotene, flavones, flavonols, flavonones, flavan-3-ol, vitamin B6, magnesium, onion, garlic, ginger, vitamins A, C, E, D, niacin, riboflavin, thiamine, anthocyanidins, zinc, selenium, folic acid and eugenol.³⁹

A review of studies on the nutritional quality of the diet and risk of depression found following a high-quality diet regardless of type (healthy, prudent, Mediterranean) was associated with a lower risk of depressive symptoms. People consuming higher amounts of vegetables had an 18% lower risk of experiencing depressive symptoms, and those with a low dietary inflammatory index had a 19% lower risk.⁴⁰

Antioxidant effects

The brain is considered highly susceptible to oxidative stress, or the imbalance between the production of pro-oxidative reactive molecules and counteracting antioxidants. This 'redox imbalance' is implicated in psychological disorders such as depression, anxiety and emotional stress as well as degenerative brain diseases.⁴¹

A review on diets, food and food components that affect post-prandial (after-meal) inflammation, endothelial (blood vessel) function and oxidative stress found eating nuts; L-arginine; polyphenols from berries and citrus have multiple protective effects, and may reduce the adverse post prandial effects of meals high in saturated fats and sugars.⁴²

Biological and cognitive degeneration in aging is thought to be due to an imbalance between oxidative stress and the body's antioxidant systems. Carotenoids (red, orange and yellow pigments in brightly coloured fruit and vegetables) have been investigated for the prevention of age-related disease because of their role in counteracting oxidative stress. Orange-yellow fruit and vegetables are rich in beta-carotene and alpha-carotene, while alpha-cryptoxanthin is found in orange fruit, red lycopene is found in watermelon, tomatoes and tomato products and yellow lutein/zeaxanthin are found in green leafy vegetables and sweetcorn among others. Many studies show carotenoids protect against age-related diseases (ARD) by reducing oxidative stress through interrupting the production of free radicals (harmful unstable chemicals). Controlling systemic inflammation (general inflammation that occurs throughout the body) may also help prevent ARD.⁴³

Fruit and vegetables are dietary sources of vitamin E, vitamin C and beta-carotene which are important in the antioxidant defence of cells. Vegetable oils such as extra virgin olive oil, nuts and seeds are the main sources of vitamin E (sweet potato and avocado are also sources). Fruit and vegetables are the main source of vitamin C and beta-carotene. Having higher intakes of these nutrients is associated with better cognitive function in older people and the association is stronger for food sources than supplements.⁴⁴

Vascular effects

Many studies have found vegetable consumption is protective against cardiovascular diseases. Specific vegetables such as potatoes, tomatoes, onions, celery, broccoli, lettuce and asparagus have shown potential in preventing and treating cardiovascular diseases. The bioactive components involved are vitamins, minerals, dietary fibres, plant proteins and phytochemicals. The mechanisms by which these components might protect against cardiovascular disease include: antioxidant; anti-inflammatory; anti-platelet; regulating blood pressure, blood glucose, and lipid profile; attenuating myocardial damage; and modulating relevant enzyme activities, gene expression, and signalling pathways.⁴⁵

So why is this relevant to cognition and mental health?

Current evidence supports a link between cardiovascular disease and brain conditions such as stroke, dementia and cognitive impairment. Several large population studies have demonstrated that cardiovascular risk factors, aside for contributing substantially to the risk of stroke, negatively influence overall brain health.⁴⁶ There are also links between coronary heart disease and mental illness and they may share common causes.⁴⁷

Links between heart and brain health suggest that dietary patterns and components that are good for the heart are also good for the brain.

Dietary fibre

Diets low in fibre can increase the risk of disturbance in gut bacteria (microbiota dysbiosis) and associated reductions in psychological wellbeing, which in turn can induce poor stress response behaviour and mood. Diets high in fibre can improve microbiota health to positively impact psychological wellbeing. Short chain fatty acids such as butyrate and propionate directly affect brain physiology and behaviour by reducing brain inflammation and managing overall brain maintenance by scavenging for damaged or unnecessary cells.⁴⁷

The brain-gut axis has been well studied and the gut considered a 'second brain' because of the large number of neurons in the gut wall. More recently the role of gut microbiota has been discovered to play an important role too. Gut microbes can synthesise neurotransmitters (brain messenger chemicals), affect the production of neurotransmitters and communicate with the brain. The microbiota-gut-brain axis has been shown to influence resilience and response to stress, and gut dysbiosis (imbalance) is associated with depression. The concept of psychobiotics has now been developed. Psychobiotics are bacteria that have positive mental health benefits and promote psychological resilience. Diet is considered a major facilitator between the microbiota and resilience, and healthy plant-based diets such as the Mediterranean diet are associated with better resilience and reduced risk of depression.⁴⁸

Fruit, vegetable and nut intake may improve psychological wellbeing through positive effects of dietary fibre on the gut microbiota.

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SEARCH TERMS USED FOR PUBMED: Plant food diet and mood state/ diet and mood/ diet and mental health/ antioxidants and mood/cardiovascular disease and brain

Appendix 3 - Sub-category claim – Fruit

SUB-CATEGORY CLAIM for FRUIT and GOOD MOOD

Consumer fun inspirational messages

Eat fruit; a good mood will follow suit
Feeling crappy? Eat fruit to be happy
Are the struggles real? You'll be OK just get FRU-IT.

Eat on the Bright side
(Naturally) boost your mood with Australian fruit

Substantiation

Consumer message (suitable for website)

- Eat fruit; a good mood will follow suit
- Feeling crappy? Eat fruit to be happy
- Are the struggles real? You'll be OK just get FRU-IT.

Formal claim (suitable for website):

A healthy varied diet high in fruit such as [commodity name] is good for psychological wellbeing and happiness.

Supporting evidence from scientific literature

There are many studies that support the benefits of eating fruit for enhanced psychological wellbeing.

A systematic review of 61 studies considered a number of mood characteristics ranging from general and mental wellbeing, quality of life, sleep quality, life satisfaction, flourishing, mood, self-efficacy, curiosity, creativity, optimism, self-esteem, stress, nervousness, or happiness, to anxiety and distress. The results indicated that high total intake of fruit and vegetables, and some of their specific subgroups including berries and citrus, may promote higher levels of optimism and self-efficacy, as well as reduce levels of psychological distress.¹

A recent study involving a nationally representative sample of 12,385 Australian adults surveyed over several years reported that combined fruit and vegetable consumption was predictive of increased happiness, life satisfaction and wellbeing, with improvements observed within 2years.²

Eating fruit as a snack compared to unhealthy snacks such as chocolate or crisps, was found to be associated with lower anxiety and emotional distress.³

A cross-sectional, prospective Australian study of over 60,000 adults (greater than 45 years in age), found increasing fruit and vegetable consumption may help reduce psychological distress in middle-aged and older adults.⁴

In both adults and children, emerging evidence suggests that increased fruit intake may improve psychological wellbeing.⁵ The Australian Victorian Child's Health and Wellbeing study (3370 children) observed that children with a higher number of daily fruit servings had significantly better odds of emotional control, problem management and relationship building skills (pro-social behaviour).⁶ A randomised controlled trial of low fruit and vegetable consuming young adults found that providing 2 added daily servings of fruit and vegetables to eat significantly improved psychological wellbeing (e.g., feelings of vitality, flourishing, and motivation) compared to just reminding them to eat their fruit and vegetables.⁷

Of the top 10 raw foods related to better mental health six were fruit: banana, apple, grapefruit, citrus fruit, fresh berries and kiwifruit.⁸

Flavonoid phytochemicals found in fruit may impact cognition and reverse age-related declines in memory and learning. In particular, evidence suggests that foods rich in three specific flavonoid subgroups, the flavanols, anthocyanins and/or flavanones, possess the greatest potential to act on the cognitive processes.⁹

A systematic review of 17 studies found an association between higher fruit and vegetable intake and better mental health in adolescents. The components of mental health assessed included health-related quality of life, mental health status, happiness and self-esteem as well as anxiety, stress and distress and depressive symptoms. The strongest benefits were found for fresh fruit along with both green and yellow vegetables.¹⁰

Nutrient-rich fruits clearly have benefits for brain function and psychological wellbeing.

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SEARCH TERMS USED FOR PUBMED: Fruit and mood and (mental health, wellbeing, psychological wellbeing) (review)

Appendix 4 - Sub-category claim – Vegetables and Mushrooms

SUB-CATEGORY CLAIM for VEGETABLES and MUSHROOMS and GOOD MOOD

Consumer fun inspirational messages

Brighten your day with vegetables (OR)
Colour your day with vegetables (OR)
Mood boosting vegetable rainbows (AND)
Mood boosting Mushies

Eat on the Bright side
(Naturally) boost your mood with Australian vegetables

Substantiation

Consumer message (suitable for website)

- Brighten your day with vegetables (OR)
- Colour your day with vegetables (OR)
- Mood boosting vegetable rainbows (AND)
- Mood Boosting mushies

Consumer friendly nutrient content claim and general level health claim (suitable for website)

- A healthy, varied diet with a variety of colourful vegetables such as [commodity name] is good for brightening your mood, brain function, psychological wellbeing and happiness.
- All vegetable varieties contain fibre, vitamin C, folate and potassium plus colourful antioxidant such as pigments beta carotene and anthocyanins.

Supporting evidence from scientific literature

We all know eating fruit and vegetables is key to a healthy body but it's fascinating to learn these plant foods are key to a healthy brain too. Happiness is just one bite, crunch, snap, chew away!

Plant foods in general

People who eat diets rich in plants foods such as fruit, vegetables, nuts and mushrooms have better psychological wellbeing and increased happiness. A large analysis of 61 research studies found a high total intake of fruit and vegetables, and some specific subgroups such as green leafy vegetables, may promote higher levels of optimism and self-efficacy, as well as reduce levels of psychological distress.¹ Self efficacy means having confidence in yourself and believing you can achieve. The same researchers found similar results for adolescents after assessing 17 studies. Those eating fruit and vegetables had greater psychological wellbeing, better self-esteem, happiness, were less stressed, had less depressive symptoms.²

An Australian study surveying 12,385 Aussie adults over several years also found that consistent fruit and vegetable consumption was predictive of increased happiness, life satisfaction and wellbeing.³ Eating vegetables and fruit is important at any age. A large Australian study of over 60,000 adults over 45 years of age that found regularly eating vegetables and fruit may help reduce psychological distress in middle and older age.⁴ Whereas another research team found giving young adults that general don't

eat fruit and veg two extra servings of fruit and vegetables a day significantly improved their feelings of vitality, flourishing, and motivation.⁵

Vegetables as a group

A few studies have analysed the vegetable group separately and found people enjoying higher amounts of vegetables had an 18% lower risk of experiencing symptoms of depression.⁶ Other researchers found the days when more vegetables are eaten means enhanced psychological wellbeing.⁷ On days when individuals consumed 0.15 more portions of vegetables (and 0.11 more portions of fruit), they experienced higher positive affect, which included feeling calmer, happier, and more energetic.^{8,9} Now wouldn't we all like to feel that and all it takes is a few more bites of fruit and vegetables each day.

Others have found eating just one more portion of vegetables and fruit each day is enough to improve psychological wellbeing with the results predicted to be accumulative i.e. the more fruit and veg you eat the better you feel.^{5,10}

Importantly young people who "ate vegetables 3+ times per day in the past 30 days" were 25% less likely to experience suicidal ideation.¹¹

For older people higher long term vegetable intake has been linked with better cognition and lower information processing speed after five years. In particular cabbage and root vegetables were associated with better cognitive function.¹²

An Australian Mediterranean diet study found people in the study with greater vegetable diversity had greater reduction in depression and improved mental health scores - sustained over 6 months.¹³ A review of the Australian National Nutrition Survey 1995 found adults eating higher amounts of vegetables had a reduced risk of depression. Specifically women with depression ate 12% less vegetables than women without depression.¹⁴

Specific types of vegetables

Several studies have identified certain types of vegetables as important for mental wellbeing. Carrots, dark green leafies, lettuce and cucumber were in the top 10 raw foods linked to better mental health.¹⁵ In fact green leafies have been identified a few times.^{1,15} A worksite nutrition program coined the acronym G-BOMBS +T as way to remind study participants of what to eat:

Greens, **B**eans, **O**nions, **M**ushrooms, **B**erries, **S**eeds and nuts plus **T**omatoes

Together these foods significantly improved sleep quality, quality of life, and depressive symptoms.¹⁶

Green vegetables and yellow vegetables in general have also been found as important for adolescent mental health. Consumption of green and yellow vegetables were associated with a reduced risk of depression^{17,18} and green vegetables were link with better behaviour scores in young people¹⁹.

Cruciferous vegetables from the *Brassica* family such as broccoli, Brussel's sprouts, cabbage, cauliflower and kale contain beneficial phytonutrients called glucosinolates that are converted into isothiocyanates in the body.²⁰ Isothiocyanates show protective effects against cardiovascular disease, inflammatory disorders and brain degenerative diseases.²¹ Isothiocyanates are showing promising effects to improve brain function.²² Oxidative stress is commonly associated with the development of many diseases, including brain degenerative disorders, and inflammation is also associated with cardiovascular disease and degenerative brain disorders. Isothiocyanates have double benefits as they have both antioxidant and anti-inflammatory activity.²³

Colourful vegetables – is the colour important?

Clearly the answer is yes based on the above findings. The gorgeous colourful pigments of vegetables (and fruit) are due to natural plant chemicals such as

- carotenoids such as lutein and zeaxanthin (yellows), beta-carotene (oranges), lycopene (reds)
- other polyphenol compounds such as anthocyanins (red/purples/blueish blacks) and even
- chlorophyll (greens)

Quality of life and mental health status improved in those eating more fruit and vegetables and consuming more beta-carotene and vitamin E.²⁴ Interestingly those who have attempted suicide were found to have low levels of vitamin C and carotenoids such as lutein/zeaxanthin and lycopene.²⁵ One team found no link with vitamin C and carotenoids and suggested this may have been because not enough was consumed. Thus indicating more may be better.⁵ Pre-menopausal women consuming green salads also had higher levels of vitamin C, lutein, beta-carotene, and beta cryptoxanthin. As a result they had lower oxidative stress and improved antioxidant status²⁶ which may also be important for the brain and its blood vessels.

A diet rich in carotenoids, due to consumption of orange- and green-coloured fruit and vegetables, was also found to be associated with a higher cognitive score and memory test scores.²⁷

Adding healthy fats such as avocado or extra virgin olive oil dressings to vegetables and salads actually helps absorb these carotenoid pigments.²⁸⁻³⁴ More reasons to combine a variety of vegetables to maximise mood boosting nutrients.

Dark red and purple vegetables such as beetroot, eggplant, red cabbage, radicchio, red onion and radish contain the pigments anthocyanins. Anthocyanins appear to have a protective effect on the brain through improvement on cognitive performance and memory.³⁵

Cooking can significantly reduce levels of anthocyanins in vegetables such as red cabbage although shorter cooking times in small amounts of water helps retain nutrients.³⁶

Vegetables gardens – a little tranquillity in troubling times

Finally vegetable gardening is an excellent way to manage stress during these crazy COVID-19 times. An Italian Professor of Plant Biology and Soil Chemistry recently wrote of his experience being in COVID-19 lockdown in Italy and how creating a vegetable garden in his apartment helped him to reduce the accumulated mental stress, psychological burden and helped himself be partly food self-sufficient.³⁷ This is support by a clinical trial in South Korea that found improvements in cognitive function in a group of elderly residents developing a vegetable garden. Specifically there was an increase in the brain nerve growth factor brain-derived neurotrophic factor (BDNF).³⁸ Low levels of BDNF are involved in depression.

Mushrooms

Mushrooms are rich in niacin, and a source pantothenic acid and biotin, these nutrients maintain brain function and reduce fatigue. Mushrooms also have antioxidant properties due to antioxidant vitamins, minerals, carotenoids and polyphenols³⁹ as well as anti-inflammatory effects⁴⁰. Mushroom studies have demonstrated anti-fatigue⁴¹, anti-depressant effects⁴² along with improvements in memory^{43,44}.

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SEARCH TERMS USED FOR PUBMED: Vegetables/mushrooms and [mood/psychological wellbeing/ beta-carotene/ anthocyanins] (review)

Appendix 5 - Sub-category claim – Nuts

SUB-CATEGORY CLAIM for NUTS GOOD MOOD FOODS

Consumer fun inspirational messages

Nuts: Happiness in a handful

Eat on the Bright side
(Naturally) boost your mood with Australian/Aussie Tree Nuts

Substantiation

Consumer message (suitable for website)

- Nuts: Happiness in a Handful

Formal claim (suitable for website):

A healthy, varied diet containing a variety of nuts such as [commodity name] is good for brain function and psychological wellbeing – putting you in happy mood.

Supporting evidence from scientific literature

Nuts are well known for maintaining healthy hearts but their bold impact on the brain is something new. Nuts are linked with better brain health through better cognitive function, learning, memory, psychological wellbeing and mood.¹ Nuts will keep your happy, motivated and sharp.

Mediterranean diets with nuts for positive moods

No need to feel blue in the Mediterranean Blue Zone. Those living in Blue Zones are some of the longest living so what's their secret? The Mediterranean diet rich in fruit, vegetables and nuts has a positive effect on psychological wellbeing and mood. One study surveying 9,255 people measuring positive affect (five items on positive emotion: inspired, alert, excited, enthusiastic, and determined) and negative affect (five items on negative emotion: afraid, upset, nervous, scared and distressed) found eating fresh vegetables, fruit, nuts and olive oil was linked with positivity; and fresh vegetables, fresh fruit, and nuts was inversely associated with negative affect. This means the more these foods were eaten the more positive and less negative emotions were experienced.²

Nuts reduce depression risk and better quality of life

Your favourite nuts may also reduce your risk of developing depression symptoms. Another Mediterranean Diet study (The SUN Study) followed just over 10,000 people for around 4 years and found those eating more fruit and nuts together had a 33% reduce risk of developing depression compared to those eating less fruit and nuts.³

The PREDIMED Mediterranean diet with just under 7,500 participants assessed for nearly 5 years found those following a Mediterranean diet plus a daily 30g of nuts (walnuts, almonds, hazelnuts) had a 22% reduce risk of depression compared to those following a reduced fat diet. When only those with type 2 diabetes were assessed (nearly half the group) they had a 30% reduced risk.⁴

An Australian Mediterranean diet study found those eating more nuts (and greater vegetable diversity) had greater reduction in depression and improved mental health scores, which were sustained over 6 months.⁵

A Chinese study of some 13,600 people found those eating nuts at least one a week had an 18% reduction in depression risk compared to those eating nuts less than once a week.⁶

The Australian SMILES trial with 67 participants found improvements in ratings of depression after 12 weeks of a special diet which included a daily serving of nuts.⁷ The same research team also identified folate, magnesium and zinc as key nutrients linked to lower depressive scores – nutrients found naturally in nuts.⁸

A small study of 25 young women showed significant improvements in self-rated vigour, alertness and contentment from eating a nutrient rich Mediterranean diet for just 10 days.⁹

If you need a reminder to eat healthy foods think G-BOMBS+T. A worksite nutrition program coined the acronym G-BOMBS+T as way to remind study participants of what to eat:

Greens, **B**eans, **O**nions, **M**ushrooms, **B**erries, **S**eeds **and** **n**uts plus **T**omatoes

Together these foods significantly improved sleep quality, quality of life, and depressive symptoms.¹⁰

Nuts have been found to reduce anxiety in men – high nuts eaters were 66% less anxious than low nut eaters.¹¹

Nuts also influence brain communication compounds involved in signalling systems that regulate mood. Nuts contain the amino acid tryptophan which is needed by the brain to make the happy hormone serotonin.¹² Brain-derived neurotrophic factor (BDNF) is another brain mood regulator. A daily 30g serve of nuts as part of a Mediterranean diet consumed for over 3 years lead to improved levels of BDNF.¹³

Nuts and better cognition

Next time someone says “you’re nuts!” just say thanks – eating nuts improves your brain function and cognition – your ability to process information and experiences. A review by University of South Australia researchers, of more than 70 studies, found that a 30g handful of nuts enjoyed daily may improve mental processes such as memory, problem solving and decision making. It may be nuts’ ability to reduce inflammation and improve blood flow that’s key.¹⁴

A 2019 systematic literature review of 19 articles found in most experimental studies there was a protective effect of nut consumption on some measure of cognitive function. These effects appear to be independent of nut type, amount of intake, age and participants health at baseline. The researchers concluded the inclusion of daily nut consumption in the healthy diet pattern of adults could have positive effects on their cognitive function.¹⁵

Long-term higher nut intake has been linked many times with better overall cognition in older ages.¹⁶⁻¹⁹

A subgroup of 522 elderly people in the PREDIMED study, eating a Mediterranean diet with a handful of nuts every day, had improved cognitive performance after 6.5 years compared to those following a reduced fat diet.¹⁶ Women regularly consuming a high intake of nuts had better cognition scores than those consuming fewer or no nuts. This high nut intake appeared protective by reducing cognitive aging by two years.¹⁷ The more nuts you eat and the longer you eat them is, the better the results. Another group found in just over 2,600 adults aged 43-70years who consumed nuts for five years was significantly linked to improved cognitive function (memory, speed, flexibility) with no cognitive decline over this time either.¹⁸

A large group of older men (1,866) undertaking cognitive tests found those eating nuts twice a week had significantly better cognitive performance than those eating nuts <1 serving a month.¹⁹

A 2017 study by researchers at Loma Linda University Health found eating nuts on a regular basis strengthens brainwave frequencies associated with cognition, healing, learning, memory and other key brain functions. Pistachios, for instance, produced the greatest gamma wave response, which is critical for enhancing cognitive processing, information retention, learning, perception and rapid eye movement during sleep. Peanuts produced the highest delta response, which is associated with healthy immunity, natural healing, and deep sleep.²⁰

Healthy hearts = healthy brains

How nuts has this effect may have to do with the unique combination of nutrients in nuts such as healthy fats, antioxidant vitamins and minerals (vitamin E, copper, manganese, selenium, zinc), and phytochemicals with antioxidant and anti-inflammatory properties. These compounds help keep hearts healthy by protecting blood vessels so may help protect brain function and its blood vessels too.^{15,21}

Get cracking and crunching every day – nuts are definitely happiness in a handful!

(For the mood and brain boosting benefits of individual nuts refer to the sections on: Almond, Chestnut, Hazelnut, Macadamia, Pecan, Pistachio and Walnut).

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SEARCH TERMS USED FOR PUBMED: Nuts and diet and [mood/mental health/psychological wellbeing/ brain function/ cognition/cognitive]

Appendix 6 - Sub-category claim – Gardening (Nursery and Turf)

SUB-CATEGORY CLAIM - NURSERY AND TURF GOOD MOOD FOOD

Consumer fun inspirational messages

Feeling shirty? Get your hands dirty.

A little tranquillity in troubling times.

Boost your mood getting out in the garden with Aussie nursery plants and turf/grass.

Substantiation

Consumer message (suitable for website)

- Feeling shirty? Get your hands dirty.
- A little tranquillity in troubling times.
- Boost your mood getting out in the garden with Aussie nursery plants and turf/grass.
- Campaign tagline: Boost your mood get gardening

Formal claim (suitable for website):

- A healthy lifestyle including gardening is good for psychological health and wellbeing

Supporting evidence from scientific literature

Every gardener knows how good it feels to get your hands dirty out in the garden on a sunny day and there is research to support this idea too.

An analysis of twenty-two studies on the effects of gardening on human health found gardening reduced depression and anxiety as well as increased in life satisfaction, quality of life and sense of community and cognitive function.¹ Further research found community gardening activities had a positive effect on psychological and social wellbeing including social interaction, sense of community and less perceived stress.²

Gardening for 30 minutes has been shown to promote relief from stress by reducing the stress hormone cortisol and generating a more positive mood.³ Just looking at gorgeous green plants is enough to induce relaxation. In a study of 24 young men, looking at foliage plants for just 3 minutes significantly helped induce physical relaxation in the brain as well as psychological relaxation leading to more positive emotions of feeling comfortable and relaxed.⁴ New Zealand adolescents actively participating in gardening also had improved mental health and wellbeing. These young gardeners also reported slightly lower levels of depressive symptoms, enhanced emotional wellbeing and experience higher family connection than students who do not participate in gardening.⁵

A survey of gardeners versus non-gardeners' perceptions of life satisfaction found gardeners reported significantly better energy levels, optimism, zest for life and better perception of their physical abilities and appearance. Gardeners also rated their overall health as better and were more physically active.⁶

In older people, gardening has been found to enhance physiological and psychological relaxation, including reduced blood pressure and changes in brainwaves⁷ as well as improved cognitive function¹. A professor of plant biology and soil chemistry in an Italian university suggested starting a home vegetable garden during the COVID-19 pandemic because of the recreational, health, economic and environmental benefits. In his personal experience during the quarantine period in one of the hardest hit countries in the world, he found creating his own vegetable garden had psychological benefits as well as creating partial self-sufficiency in fruit and vegetables.⁸

Other benefits of gardening

Mowing, hoeing, hedging, weeding, trimming and digging are excellent forms of exercise and regular gardening can also help control bodyweight.¹

School gardening programs

Children and adolescents involved in gardening and growing fruit and vegetables are more likely to eat them^{5,9,10} and therefore experience the health benefits they bring - creating healthy lifelong habits.

Fun facts about gardening

- The ABC TV program *Gardening Australia* celebrated its 30th birthday in 2019 and it is Australia's premiere gardening program
- Vanilla pods used in cooking come from an orchid called *Vanilla planifolia*
- The fastest growing plant in the world is bamboo which can grow 35 inches in a day

Benefits of green space

The effects of nature in general on mental and physical health are well known. Experiencing nature makes us generally happier and healthier.¹¹ A review of 12 studies found children's access to green space was associated with improved mental wellbeing and better overall health and cognitive development. It promotes attention restoration, memory, competence, supportive social groups, self-discipline, moderates stress, improves behaviours and was even associated with higher standardised test scores.¹²

So whether you don the gardening gloves, strap on the gardening tool belt and slap on a straw hat, or just take the kids for a run on a grassy field, all will help to reduce stress, induce relaxation and improve brain performance. And getting the kids growing fruit and vegetables will also get them eating more fruit and vegetables and that's a great thing for their overall wellbeing.

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SEARCH TERMS USED:

- Google Scholar: gardening or green plants and mood/ mood states/wellbeing/psychological
- PUBMED: 'Similar articles' to Soga 2017/ [school and gardening and children and wellbeing]

Appendix 7 - Sub-category claim – Cooking

SUB-CATEGORY CLAIM for COOKING and A GOOD MOOD

Consumer fun inspirational message

In a bad patch? Cook fruit and veg from scratch
Feeling blue? Cook up a vege stew
Cooking time is family time

Cook on the Bright side
(Naturally) boost your mood with fresh Aussie fruit, veg and nuts

Substantiation

Consumer message (suitable for website)

- In a bad patch? Cook fruit and veg from scratch
- Feeling blue? Cook up a vege stew
- Cooking time is family time

Formal claim (suitable for website):

Cooking has positive outcomes of wellbeing and quality of life for the whole family.

Supporting evidence from scientific literature

Cooking is a vital life skill that everyone needs. Food education programs have been found to significantly improve food security status, cooking confidence, food preparation behaviours, nutrition knowledge, vegetable consumption, and health outcomes such as weight.¹⁻⁶

A systematic review of 377 journal papers suggests that cooking interventions may positively influence psychosocial outcomes. Both inpatient and community-based cooking interventions yielded positive influences on socialisation, self-esteem and quality of life. Cooking requires integration of cognitive, physical, and socio-emotional processes, and learning to cook involves the mastery of skills, which might explain why cooking can promote positive mood, self-confidence, and self-esteem.⁷

A population-based survey of 8,500 adolescents in New Zealand found self-reported cooking ability was positively associated with better family connections and greater mental wellbeing.⁸

A non-randomised intervention study examined the influence of 10 weeks of a weekly 90-minute cooking program (*Jaime Oliver's Ministry of Food*) on cooking skills and nutritional outcomes in Australian adults from communities experiencing lower socioeconomic status and high rates of obesity. The results found a statistically significant difference from baseline to completion in self-esteem scores in members watching Jamie compared with those in the control group. In qualitative interviews 6 months later, participants reported that the cooking program contributed to feelings of accomplishment and confidence.⁹

Compared to raw fruit and vegetables, cooking can increase the bioavailability of phytonutrients.¹⁰ Cooking food can significantly increase micronutrient availability, specifically iron and beta-carotene from plant foods.¹¹

Research conducted in 2009 (1,421 people representing 1,007 meals prepared in the home), found the vast majority felt that cooking a meal is an enjoyable and satisfying experience that benefits the whole family.¹²

Learning to cook and having the opportunity to cook may provide a unique means for adolescents to develop life skills and contribute positively to their families.⁷ There is a positive association between family meal frequency and fruit and vegetables.¹³

A mix of raw and cooked vegetables is needed in a health balanced diet. So get out the cookbooks and explore and experiment with the kids to give them a key life skill, as well as bolster their self-esteem and confidence in the kitchen.

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SEARCH TERMS USED FOR PUBMED: Cooking and culinary therapy and review and diet (mood/mental health/wellbeing/ home cooking, family cooking/nutrient bioavailability)

Appendix 8 - Sub-category claim – Hydration

SUB-CATEGORY CLAIM for VEGETABLES, FRUIT AND FLUIDS for BRAIN FUNCTION

Consumer fun inspirational messages

Refresh with veg and fruit for extra fluids
High-dration for mood boosting brain benefits

Substantiation

Consumer messaging (suitable for website):

- Refresh with veg and fruit for extra fluids
- High-dration for mood boosting brain benefits

Formal claim (suitable for website):

A healthy, varied diet containing a variety of fruit, vegetables and mushrooms contributes fluids to help hydration, and maintain brain function and mood.

Supporting evidence from scientific literature

The human body is 50-80% fluids depending on muscle mass.¹ It is vital for all body functions. It plumps up our body cells giving us physical form; it gives blood its ability to transport nutrients, hormones, and other messengers; it keeps us cool, and helps us excrete waste.

We lose water when we sweat, pee, poop, vomit even breathe so body fluids must be replaced regularly throughout the day. The local environment and weather also determines how much water is lost and needs to be replaced. The NHMRC recommends about 8 cups of water a day for women and 10 cups for men.

How do you know if you're well hydrated? Check the colour of your pee². In short if your urine is a pale yellow almost clear liquid during the day then you're well hydrated.
(Assuming you're not taking B group vitamins which turn your pee yellow.)

Fresh fruit and vegetables contain about 60-90% fluids so eating the recommended two serves of fruit and five serves of veg a day will contribute about 500-700ml of fluids to the body. Nuts and dried fruit have less fluids 3-30%. They are dried to help preserve these foods for longer. Bacteria, mould and fungi need water too so removing the water, and increasing the natural fruit sugars, vitamins, minerals and antioxidants, keeps these foods shelf stable for longer without the need for refrigeration.

The brain contains 75% water and water loss can affect brain function.³ Dehydration is a reliable predictor of impaired cognition as dehydration is thought to effect energy production in brain cells, and reduce transmitters involved in learning and memory. These can also occur with aging.⁴

Let's take a look at some of the research...

After a 12hour overnight fast a group of 12 Chinese young men were given a range of cognition tests and surveys to assess brain function and mood. They were then asked not to drink water for 36hrs but were given meals, when they rehydrated with 1,500ml water the tests were performed again. Results showed dehydration had negative effects on vigour, esteem-related affect, short-term memory, and

attention. Rehydration with water alleviated fatigue and improved total mood disturbance, short-term memory, attention, and reaction.^{3,5}

Research particularly in athletes and soldiers has found even just a small loss of body water or dehydration can cause the brain to lose focus, affecting performance. Thirty one elite US soldiers went through 53 hours of a gruelling military exercise in heat to tests cognitive and physical markers of stress. Volunteers lost 4.1kg of weight, mostly water (3.1L). There was a substantial decline in cognitive function, assessed with computerised tests. Vigilance, reaction time, attention, memory, and reasoning were significantly impaired. Similarly mood, including vigour, fatigue, confusion, depression, and tension all assessed by questionnaire, significantly deteriorated.⁶

A small group of 11 heat acclimatised athletes were dehydrated by a combination of water restriction and exercising in heat. Then psychological functions tests were undertaken including arithmetic ability, short-term memory, and visuomotor tracking. The results indicated significant deterioration in mental functions at 2% or more body dehydration levels.⁷ If 1litre of fluid equals 1kilogram, this would mean if you weigh 70kg just 1.4kg or 1,400ml of fluid lost would affect cognitive function.

A more recent study in soccer players saw no difference in the mental performance tests after two 45min sessions of exercise in those taking no fluids.⁸

Older people are more susceptible to dehydration. Whether it's that their thirst mechanism becomes unreliable with age, they are more effected by weather and environmental conditions, or they simply forget to drink, ensuring older people are well hydrated can preserve their cognitive function.

Assessing the link between dehydration and poor cognition researchers assessed data from the Berlin Aging Study II with responses from over 1,000 older adults aged 60-89 years. They found higher dehydration was associated with steeper decline in cognitive functioning and wellbeing over time, and lower wellbeing among those with higher body mass index.⁹ Similarly a US study assessing data from the 2011-14 NHANES studies, from around 1,200 males and 1,200 females aged over 60 years, found hydration status and water intake were moderately associated with attention/processing speed among females only.¹⁰ A study from Hong Kong found eating more than two serves of fruit and/or vegetables per day and more than 5 cups of fluids was associated with a reduced risk of dementia in a group of subjects over 60 years.¹¹

For some only a small water loss is enough is affect cognition and mood: 174 people were placed in 6 groups in 30°C degree heat for three hours and given a range of different liquids including one group with no liquids - cognition and mood was also tested. A loss of just 0.66% in body mass (660ml) was associated with a disruption of functioning including mood.¹²

Similarly a small loss of 1.1% of body weight negatively affected the driving capability of 11 male drivers. There was a progressive increase in the total number of driver errors in those with mild dehydration during a simulated 120 minute monotonous driving exercise.¹³

It's clear to be in a good mood and have a fighting fit brain capable of handle all of life's stresses adequate hydration is a must. And while we may immediately think of beverages as the solution to dehydration, a diet rich in fruit, vegetables and mushrooms will also provide fluids along with a wide range of nutrients and antioxidants that brains need to function well.

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SEARCH TERMS USED FOR PUBMED: Fruit and vegetables/fluids and dehydration and [mood/mental performance/psychological wellbeing/ brain function/ cognition/cognitive]