

Department of
Nutrition & Dietetics

Nutritional Management of Sarcopenic Obesity



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What is Sarcopenic Obesity?

Sarcopenia is a condition that affects older adults, where muscles gradually weaken and shrink, making it harder to move or perform physical tasks. This muscle loss is linked to frailty, which can lead to other problems like depression, fear of falling, and increased risk of falls and fractures.

As more people becoming obese as they age, having both obesity and sarcopenia (known as **sarcopenic obesity**) worsens the loss of muscles and physical abilities, and increases the risk of serious health issues and death. Sarcopenic obesity leads to worse health outcomes compared to sarcopenia or obesity alone. These include falls, reduced mobility, inability to manage daily activities, higher risk for heart disease and stroke, reduced psychological well-being and lower quality of life.

Nutritional Goals

1. Lose body fat with healthy, balanced diet
2. Preserve muscle mass with appropriate protein intake

Overweight and Obesity

Overweight and obesity are defined as excessive body fat accumulation that may affect one's health. Being overweight or obese puts you at risk of heart diseases, stroke, diabetes, high blood pressure, some types of cancer, bone and joint problems.

Body fat can be estimated using Bioelectrical Impedance Analysis (BIA), Body Mass Index (BMI) and waist circumference.

It is recommended to aim below 30% body fat for men and below 40% body fat for women amongst seniors.

Body Mass Index (BMI)

Body mass index (BMI) estimates the amount of body fat, by using your weight and height to determine your weight category.

$$\text{Body Mass Index (BMI)} = \frac{\text{Weight (kg)}}{\text{Height (m)} \times \text{Height (m)}}$$

	BMI (kg/m ²)
Underweight	Below 18.5
Ideal	18.6-24.9
Overweight	25-29.9
Obese	Above 30

Waist Circumference

Men	Women
Aim below 90cm	Aim below 80cm

Measure your waist circumference 2.5cm above belly button.

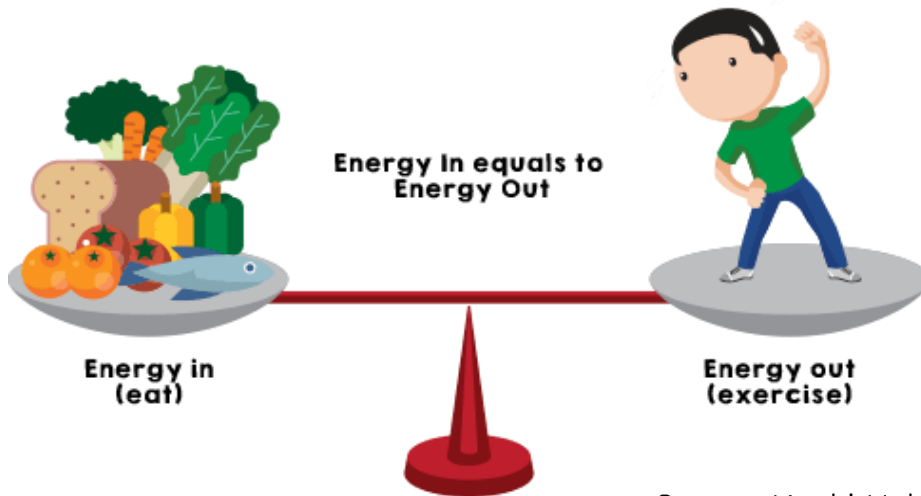
How to Lose Excess Body Fat?

Weight gain occurs when you eat (energy in) more than you burn off (energy out). To lose the excess body fat, your body needs to burn more energy than you eat. You can achieve this through a **healthy, balanced diet** and **regular physical activity**.

Weight maintenance: energy in equals to energy out

Weight loss: energy in less than energy out

Weight gain: energy in more than energy out



Source: HealthHub, 2021

Current weight: _____ kg (BMI: _____)

Goal weight: _____ kg in _____ months (BMI: _____)

Current waist circumference: _____ cm

Goal waist circumference: _____ cm in _____ months

Current % fat mass: _____%

Reduce Portion Sizes

Healthy and Balanced Diet

Good nutrition is an important part of leading a healthy lifestyle. Along with physical activity, a **healthy and balanced diet** can help you achieve healthy weight and lose excess body fat.

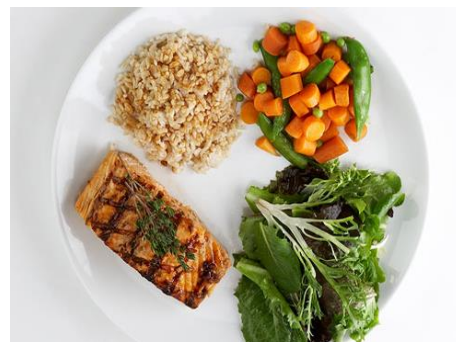
To reduce energy intake, it is recommended to:

1. Reduce portion sizes
2. Reduce fat intake
3. Reduce sugar intake
4. Increase fibre intake
5. Limit snacking or choose healthier snacks if needed

Reduce Portion Sizes



My Healthy Plate is a visual guide for creating balanced and healthy meals. It shows you what to eat in the right amounts for each meal, so that you can plan your portions accordingly.

- ✓ Fill half of your plate with fruits and vegetables. Fruits and vegetables are rich in vitamins, minerals and fibre
- ✓ Fill a quarter of your plate with wholegrains. Wholegrains provide energy for the body and contain more fibre than refined grains
- ✓ Fill a quarter of your plate with meat and others. These are sources of protein



Reduce Fat Intake

Fat is **high in energy** (1g fat = 9kcal). Cutting back on fat is an effective way of reducing energy intake.

High fat foods 	Tips to reduce fat intake 
<ul style="list-style-type: none"> Animal fat (e.g. skin of poultry, fat on meat, processed meat) 	<ul style="list-style-type: none"> Choose fresh or frozen lean meat, fish or plant-based protein. Remove visible fat and skin
<ul style="list-style-type: none"> Deep-fried food 	<ul style="list-style-type: none"> Use healthier cooking methods such as steaming, stir-frying, baking, grilling, boiling or microwaving
<ul style="list-style-type: none"> Full-fat dairy products (e.g. milk, yogurt, cheese) 	<ul style="list-style-type: none"> Choose reduced-fat or low-fat dairy products (e.g. plain reduced-fat/low-fat milk, plain low-fat yogurt)
<ul style="list-style-type: none"> Pies, pastries, cakes, chocolates, cream-filled biscuits 	<ul style="list-style-type: none"> Limit snacking or choose healthier snacks if needed (page 11-12)
<ul style="list-style-type: none"> Oil, butter, lard, ghee, salad dressing 	<ul style="list-style-type: none"> Use small amount of fat in cooking. Use cooking spray or a non-stick pan. Remove the layer of fat or oil that rises to the top of soup and gravy. Use healthy oil sparingly
<ul style="list-style-type: none"> High-fat fruits (e.g. avocado, durian) 	<ul style="list-style-type: none"> Choose other fruits

Reduce Fat Intake

- ✓ Choose food cooked using healthier cooking methods (e.g. steamed, stir-fried, baked, grilled, boiled or microwaved)
- ✓ Choose unflavoured white/brown rice over flavoured rice (e.g. chicken rice, coconut rice and bryani rice)
- ✓ Choose noodles in clear soup over noodles in gravy or fried/dry noodles
- ✓ Avoid adding fried shallots, sauces and gravies
- ✓ Trim off visible fat and skin from meat



Trim off fat and skin of meat

Reduce Refined Sugar Intake

Refined sugars (i.e. added sugars to foods and beverages) are **high in energy** but provide us with **little to no nutrition**. Limiting these foods can help with reducing energy intake.



Cordial, soft drinks, fruit juices, isotonic drinks



3-in-1 drinks / cereals*



Malted drinks, condensed milk*



Hot desserts with coconut cream*, ice-cream*, kuehs*, cakes*



Sweets, chocolates*, donuts*



White sugar, brown sugar, rock sugar, gula melaka, glucose, syrup, honey

*These foods are also high in fat

Tips to reduce refined sugar intake



- ✓ Plain water is best. You may consider water infused with fruits (e.g. strawberry, orange, pineapple, mango, watermelon, lemon, lime), ginger, rose, mint leaves
- ✓ Choose sugar-free beverages such as sparkling water, unsweetened tea (tea bags, chrysanthemum tea/barley water without sugar) and diet soft drinks
- ✓ When ordering beverages, ask for "kosong/siu dai", "0%/25% sugar" or "no/less syrup"
- ✓ Use artificial sweeteners for sweetness if necessary or use natural flavours (e.g. pandan) instead
- ✓ Limit snacking or choose healthier snacks if needed (page 11-12)

Increase Fibre Intake

High fibre foods take a longer time to digest. This will make you feel full for a longer duration, hence consuming lesser energy.

Tips to increase fibre intake

- ✓ Aim for **two servings of fruits and two servings of vegetables** a day. Eat fresh fruit (with skin whenever possible) instead of fruit juices or dried fruits

One serving of fruit	One serving of vegetables
	
<ul style="list-style-type: none"> • 1 small apple, orange, pear or mango (130g) • 1 wedge of papaya, pineapple or watermelon (130g) • 10 grapes or longans (50g) • 1 medium banana (120g) 	<ul style="list-style-type: none"> • 100g raw non-leafy vegetables • 150g leafy vegetables • ¾ mug cooked vegetables (100g) • ¼ plate cooked vegetables (100g)

- ✓ Choose **wholegrains** instead of refined grains (e.g. white rice, white bread)



Brown rice



Oats



Wholemeal bread



Wholemeal biscuits



Chapati









- ✓ Consider adding oats, barley or plant-based proteins (e.g. beans and lentils) during cooking
- ✓ Choose beans and lentils instead of meat/poultry/fish at main meals
- ✓ Keep frozen vegetables and fruits at home for a ready supply
- ✓ Add seeds (e.g. chia seeds) to your drinks or oats

Increase fibre intake gradually and drink extra fluid when increasing fibre intake to avoid constipation











Healthier Snack Ideas

Some snacks can be high in fat, sugar, or both, making them high in calories. It is recommended to **limit snacking** or **choose healthier snacks** if needed.

High Calorie Snacks ❌	Lower Calorie Alternatives ✅
 <p>1 handful potato chips = 230kcal (4600 steps)</p>	 <p>1 cup homemade popcorn (1.5 tsp unpopped corn kernels) = 130kcal (2600 steps)</p>
 <p>1 chocolate bar = 270kcal (5400 steps)</p>	 <p>1 cup of strawberries = 30kcal (600 steps)</p>
 <p>1 slice of chocolate cake = 200kcal (4000 steps)</p>	 <p>1 slice of wholemeal bread + 1 teaspoon soft margarine = 120kcal (2400 steps)</p>
 <p>1 piece of cookie = 230kcal (4600 steps)</p>	 <p>3 pieces of wheat cracker = 130kcal (2600 steps)</p>



Healthier Snack Ideas

High Calorie Snacks ❌	Lower Calorie Alternatives ✅
 <p>1 chicken curry puff = 340kcal (6800 steps)</p>	 <p>1 piece of small plain thosai = 100kcal (2000 steps)</p>
 <p>1 bowl of soya bean curd, with syrup = 180kcal (3600 steps)</p>	 <p>1 bowl of soya bean curd, no syrup = 70kcal (1400 steps)</p>
 <p>1 cup soft serve ice cream with chocolate sauce = 330kcal (6600 steps)</p>	 <p>1 small tub of plain, low-fat yogurt = 90kcal (1800 steps)</p>
 <p>1 banana fritter = 2000kcal (4000 steps)</p>	 <p>1 banana = 90kcal (1800 steps)</p>



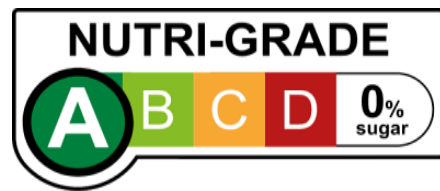
Other Healthy Eating Tips

Have regular meals at fixed timings

- ✓ Missing a meal makes you hungry, which makes you more likely to binge on unhealthy snacks or eat more during the next meal

Label reading

- ✓ Compare similar foods, and choose a brand with lower calories per 100g
- ✓ Choose food products and eateries with the Healthier Choice Symbol or Nutri-Grade A or B (lower in sugar and saturated fat)



Mindful eating






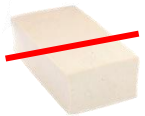










- ✓ Only eat when you feel hungry. Stop eating when you are full
- ✓ Chew your food 30 times per mouthful until the food is smooth and softened and avoid eating too fast. Only take the next spoonful of food after you have finished chewing and swallowing. It takes your brain up to 20 minutes to realise you are full
- ✓ Focus on eating and avoid any distractions (e.g. using phone or watching TV)
- ✓ Avoid eating out of large plate or container. Portion out the amount you are recommended to have, to avoid overeating
- ✓ Avoid eating due to food craving, boredom, stress, anger, depression or anxiety
- ✓ Avoid having snacks readily available at home or at work
- ✓ Drink a cup of water before your meal or when you have food cravings. Food cravings tend to subside after 15-30 minutes

Adequate Protein Intake

Adequate protein intake is essential for **tissue repair, better immunity and recovery**, and **maintaining muscles to reduce falls and fractures**.

Each star represents one serving of protein. **You are recommended to consume ____ protein stars ★ a day.** *If you have kidney disease, please speak to your dietitian as you need to limit protein intake*

Choose **high quality protein** (indicated by *) as they contain a higher amount of essential amino acids required to build muscles.

1/3 palm size of meat* (30g cooked = 40g raw)		2 tablespoon minced meat or canned fish*	
1 whole egg*		2 egg whites*	
4 medium prawns*		½ block of silken tofu*	
1 block of tau kwa*		½ cup of beans	
3 tablespoon of lentils		200ml milk or 4 tablespoon milk powder*	
1 small tub of yogurt*		200ml soymilk or 4 tablespoon soymilk powder*	
2 slices of cheese*		3 tablespoon of seeds	
1 handful of nuts		2 tablespoon of peanut butter	

Frequently Asked Questions

Q: What should I do if I am lactose-intolerant?

- ✓ Avoid dairy products (milk, yoghurt, cheese) as these foods may cause abdominal discomfort, bloating and diarrhoea
- ✓ Optimise protein intake through other foods (e.g. soy milk, tofu, egg, meat)

Q: I do not like the taste of milk and dairy products.

- ✓ Try adding milk or milk powder to coffee, tea, malted drinks (Milo/Horlicks) or cereal to mask the taste
- ✓ You can also blend milk or yoghurt with fruits of your choice (e.g. banana, mango, berries) and honey to make fruit smoothie
- ✓ Alternatively, you may consider soy milk

Q: What should I do if meat is too tough for me?

- ✓ Consider softer protein sources such as steamed fish, minced meat, egg (steamed egg, egg cooked in porridge/oats, egg drop soup), tofu, braised peanuts, baked beans
- ✓ You can also mix smooth creamy peanut butter into oats
- ✓ Yoghurt and bean curd are soft snacks options

Frequently Asked Questions

Q: I am vegetarian and there are limited protein foods for me.

- ✓ Choose vegetarian friendly protein foods and drinks such as egg, tofu, tau kwa, milk, yogurt, cheese, soy milk, kidney beans, chickpeas, lentils, peanut butter, nuts, pumpkin seeds

Q: It is difficult to prepare meals with enough protein.


- ✓ Eggs and tofu can be easily added to meals
- ✓ Use convenient canned foods like sardines, tuna, braised peanuts, and baked beans, or ready-cooked items such as roast chicken from the supermarket. You can add these to bread for sandwiches or mix them with rice or porridge for a quick and simple meal
- ✓ You can also add cheese and milk to make scrambled eggs
- ✓ Cook meat, vegetables and rice together in your rice cooker for an easy one-pot meal
- ✓ Buy pre-packaged meals/snacks high in protein (e.g. siew mai, meat pau)

Frequently Asked Questions

Q: Protein foods are too expensive for me.

- ✓ Consider buying from wet markets or house brands (e.g. FairPrice, Giant)
- ✓ Choose frozen meat or canned food (e.g. canned tuna, canned sardines, baked beans) over fresh meat for a more economical choice. Frozen meat is just as nutritious. For canned food, choose less-sodium option and drain away the sauce
- ✓ Replace meat with eggs, tofu, baked beans, canned sardines for some meals
- ✓ Make use of Seniors privileges at supermarkets (e.g. Pioneer Generation card at supermarkets)

When eating out:

- ✓ Bring your own container to save on takeaway costs
- ✓ Choose budget meals 
- ✓ Make use of food court discount (e.g. Kopitiam app, NTUC Union card at Foodfare food court)








Adequate Calcium Intake

Calcium and vitamin D keep our **bones strong** to reduce the risks of **osteoporosis and fractures**





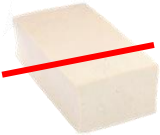


It is recommended to consume **1000mg of calcium** a day.

Each star ★ represents 100mg of calcium.

Aim to achieve **10 calcium stars (1000mg calcium)** a day by consuming a variety of high calcium foods:

Foods		Calcium stars	Calcium content
1 cup of high calcium milk (250ml or 4 tablespoon powder)		★ ★ ★ ★ ★	500mg
1 cup of high calcium soymilk (250ml or 4 tablespoon powder)		★ ★ ★ ★ ★	500mg
2 tablespoon of non-fried dried ikan bilis (40g)		★ ★ ★	270mg
5 dried figs (100g)		★ ★ ★	240mg
1 piece of canned low sodium sardines (70g)		★ ★	190-250mg
1 small tub of yogurt (100-150g)		★ ★	150-250mg
1 slice of cheese (20g)		★ ★	100-290mg

Adequate Calcium Intake

Foods		Calcium stars	Calcium content
1 serving of yogurt drink (200-250ml)		★ ★	180-340mg
1 slice of high calcium white bread (60g)		★ ★	150-210mg
½ piece of tau kwa (100g)		★ ★	150-230mg
1 cup of calcium fortified cereal (40g)		★ ★	160-200mg
½ packet of tofu (150g)		★	90-140mg
1 serve of dark green vegetables (¾ cup)		★	50-200mg
¼ cup of almond (100g)		★	100mg

- ✓ If you are **lactose intolerant**, avoid dairy products (e.g. milk, yogurt, cheese) and optimise calcium through other foods
- ✓ **Avoid excessive sodium** (less than 5g of salt a day) and **reduce caffeine** intake as it may increase calcium loss from body

Adequate Vitamin D Intake

Vitamin D helps to promote **calcium absorption**. It is recommended to consume **800IU of vitamin D** a day.

Health Promotion Board recommends **sunlight** exposure for 5-30 minutes, twice a week, ideally between 10am to 3pm. When exposed to sunlight, our skin produce vitamin D which promotes calcium absorption.



Dietary sources of vitamin D include:

- Oily fishes (e.g. salmon, mackerel, tuna)
- Egg yolk
- Liver
- Vitamin D fortified margarine
- Vitamin D fortified cereal
- Vitamin D fortified dairy products
- Vitamin D fortified soymilk



Summary

- ✓ To lose body fat, we can reduce energy intake by:
 - ✓ Reducing portion sizes
 - ✓ Reducing fat intake
 - ✓ Reducing sugar intake
 - ✓ Increasing fibre intake
 - ✓ Limiting snacking or choose healthier snacks if needed
- ✓ Adequate protein intake to preserve muscles, while losing body fat
- ✓ Choose high quality protein (animal-based protein or soy products)
- ✓ Engage in regular physical activities and taking protein-rich food within 1 hour of exercising
- ✓ Ensure adequate calcium and vitamin D intake to keep our bones strong

Notes

Meal Plan

Breakfast ___ protein ★	
Morning tea ___ protein ★	
Lunch ___ protein ★	
Afternoon tea ___ protein ★	
Dinner ___ protein ★	
Supper ___ protein ★	
Others	

Aim _____ protein stars a day ★

Clinics B2

TTSH Medical Centre, Level B2

Contact:

6357 7000 (Central Hotline)



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