Tan Tock Seng HOSPITAL

Department of
Nutrition & Dietetics

Nutritional Management of Sarcopenia

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What is Sarcopenia?

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.

Adequate nutrition is important in the prevention and management of sarcopenia. Having adequate amount of nutrition helps to maintain weight. Aim to gain weight if underweight or to regain weight lost unintentionally.

Adequate protein is required for tissue repair, better immunity and recovery, and preserving muscles mass to reduce the risks of falls and fractures.

Body Mass Index (BMI)

Body mass index (BMI) uses your weight and height to determine your weight category.

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

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

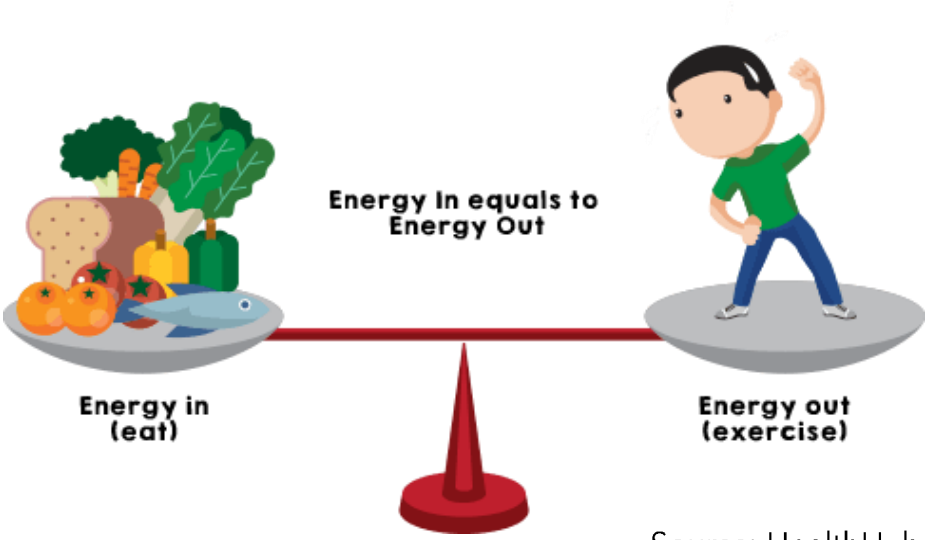
How to Achieve Ideal Body Weight?

Weight loss occurs when you eat (energy in) less than you burn off (energy out). To achieve weight gain, you need to eat more than the energy your body uses. This can be achieved through **a healthy, balanced diet** with adequate **energy and protein intake.**

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: _____)

Healthy, Balanced Diet

My Healthy Plate

Aim for **balanced diet** with adequate **energy, protein, fibre, calcium, vitamins and minerals**.

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.

Choose a **variety** of foods within and across food groups to get a variety of nutrients in your diet.

- ✓ **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
- ✓ **Fill half of your plate with fruits and vegetables.** Fruits and vegetables are rich in vitamins, minerals and fibre

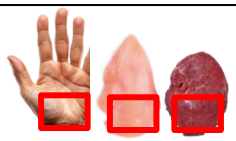
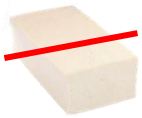
Source: HealthHub, 2021

Adequate Protein Intake

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

Each star represents <u>one</u> 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	

Adequate Protein Intake

Tips to include more protein in your diet

- ✓ Add extra egg, tofu, tau kwa, braised peanuts or beans in meals
- ✓ Replace water with milk or soymilk
- ✓ Add milk or soymilk to coffee, tea or malted beverages
- ✓ Enjoy yogurt or soy beancurd as snack
- ✓ Add cheese, peanut butter, egg, canned tuna in water, low sodium canned sardines to bread
- ✓ Take protein foods **within 1 hour after exercising** to stimulate muscles building

If you have kidney disease, please speak to your dietitian as you need to limit protein intake.

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. soymilk, 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 soymilk

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, soymilk, 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 takeaway costs

- ✓ Choose budget meals
- ✓ Make use of food court discount (e.g. Kopitiam app, NTUC Union card at Foodfare food court)

Adequate Fibre Intake

Fruits and vegetables are good sources of **vitamins, minerals and fibre**. Inadequate micronutrients intake has been linked to higher risk of **frailty.**

Tips to increase fibre intake

✓ Aim for **two servings of fruits and two servings of vegetables** a day

One serving of fruit	One serving of vegetables
• 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)	• 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 to have 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

Adequate Calcium Intake

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

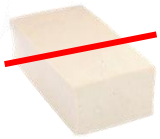
It is recommended to consume **1000mg of calcium** a day.

Each star ★ represents 100mg of calcium

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

Food		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)		★★½	270mg
5 dried figs (100g)		★★½	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

Food		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

Screening Tool to Identify Risk of Malnutrition

Are you experiencing:

- **Unintentional weight loss** (3kg or more in past 3 to 6 months)
- **Eating lesser than ½ of your usual intake** (in the past 5 days or more)

If you have answered **'YES'** to either or both of the above, you may **be at risk of malnutrition**.

Consequences of malnutrition

- Sarcopenia
- Weight loss
- Loss of muscles and strength, leading to an increased risk of falls
- Reduced immunity, leading to an increased risk of infections
- Slower recovery, leading to a longer hospital stay
- Higher healthcare costs

It is recommended that you **consult with a dietitian** for a more detailed assessment.

How can I improve my food intake if...

I experience taste changes

- ✓ Add herbs, spices and condiments to enhance flavours of foods
- ✓ Add citrus foods like lemon or lime to foods and beverages to stimulate your appetite
- ✓ Serve food warm to bring out the aroma
- ✓ Review medications that may affect taste

I have chewing or swallowing difficulties

- ✓ Choose softer foods and moisten foods with gravy
- ✓ See a dentist for denture fitting or if there are issues with your dentures
- ✓ Speak to a speech therapist on advice for suitable food texture and drinks consistency to ease chewing and swallowing
- ✓ Refer to advice from 'Oral Frailty Exercises for Healthy Living' handout
- ✓ Speak to an occupational therapist for advice on specialised utensils that can help with feeding

How can I improve my food intake if...

I have less interest in food

- ✓ Have your meals and snacks at regular timings
- ✓ Try a variety of foods with different flavours, smells, colours and textures, as this may increase your interest in foods
- ✓ Make mealtimes more enjoyable (e.g. eat your meals using brightly coloured kitchenware or utensils) to improve the appeal of foods
- ✓ Have your favourite foods at any time of the day

I have no appetite

- ✓ Have **small, frequent meals**
- ✓ Eat more when your appetite is the best (e.g. some people have better appetite in the morning)
- ✓ **Increase your physical activity** as advised by your physiotherapist, as this may stimulate your appetite (e.g. taking a walk an hour before meal can make you hungry)
- ✓ **Prioritise protein sources first, followed by carbohydrates** (e.g. rice, noodle, porridge, bread, chapati), and lastly vegetables and fruits. Vegetables and fruits are high in fibre (can make you feel full sooner) and low in calories and protein
- ✓ Avoid drinking fluids for an hour before meal, during meal and at least 20 minutes after eating, as fluids can make you feel full

What is food fortification?

Food fortification **increases the nutrient content** in foods **without increasing the portion sizes.**

Some examples are listed below:

<u>Porridge, rice or noodles</u>

- ✓ Add sesame oil, shallot oil or olive oil
- ✓ Add fish, meat, tofu, egg, braised peanuts, meat floss
- ✓ Add sweet potato or potato

<u>Bread</u>

- ✓ Spread thick layer of soft margarine, peanut butter, jam* or kaya*
- ✓ Add cheese, egg or canned tuna/sardines

<u>Oats</u>

- ✓ Add milk, soymilk, honey*, egg, peanut butter, dried fruits*

<u>Coffee, tea or malted drinks</u>

- ✓ Add milk or soymilk
- ✓ Add ice cream*, honey* or sugar* to make milk shake

* These foods may not be suitable for patients with diabetes

High Calorie Snacks

- ✓ ***Local desserts:** bean curd, sesame paste, yam paste, tau suan, bubur cha cha, pulut hitam, green bean soup

- ✓ **Savoury snacks:** curry puff, steamed bao, dim sum, you tiao, Chinese kueh, vadai, nuts, keropok

- ✓ ***Sweet snacks** : yogurt, ice cream, biscuits with cream fillings, cake, jelly, chocolate, laddu, Nonya kueh, goreng pisang, putu piring

* These foods may not be suitable for patients with diabetes

Nourishing Drinks

Choose nourishing drinks instead of water, plain coffee or plain tea that have little nutrition.

Examples of nourishing drinks are:

- ✓ Full cream milk
- ✓ Soymilk, oat milk, almond milk, rice mi…
- ✓ Yogurt drink*
- ✓ Malted drinks (e.g. Milo, Horlicks)*
- ✓ 3 in 1 cereal or drinks*
- ✓ Honey water*
- ✓ Fruit juice*
- ✓ Sweetened beverages* such as packet drinks, chrysanthemum tea or barley drink
- ✓ Cream soup

* These drinks may not be suitable for patients with diabetes

Oral Nutritional Supplements

If your poor oral intake or weight loss persists despite following the recommendations, you may require oral nutritional supplements.

Oral nutritional supplements come in different forms - such as milk-based or juice-based, standard or high calories, or specific to certain medical conditions. *Do consult your dietitian for individualised recommendations on suitability and amount to consume.*

Ways to encourage taking oral nutritional supplements regularly:

- ✓ Serve it at preferred **temperature** (e.g. gently warmed using hot water bath, kept cold in fridge or frozen to make popsicle)
- ✓ **Add it to foods** such as oats, paste desserts (e.g. yam paste, black sesame paste)
- ✓ **Add it to beverages** such as coffee, tea, malted drinks
- ✓ Blend it with fruits, honey or ice cream to make into smoothie

Summary

- ✓ Adequate nutrition is important to maintain weight. Aim to gain weight if underweight, or to regain weight lost unintentionally.
- ✓ Adequate protein intake is required for tissue repair, better immunity and recovery, and preserve muscles mass to reduce the risks of falls and fractures.
- ✓ Choose high quality protein (animal-based protein or soy products)
- ✓ Take protein foods within 1 hour after exercising to stimulate muscles building
- ✓ Aim for balanced diet with adequate energy, protein, fibre, calcium, vitamins and minerals
- ✓ If you are at risk of malnutrition: unintentional weight loss (3kg or more in past 3 to 6 months) and/or eating lesser than ½ of your usual intake (in the past 5 days or more):
  - ✓ Use food fortification
  - ✓ Choose high calorie snacks
  - ✓ Choose nourishing drinks
  - ✓ You may require oral nutritional supplements

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)

Scan the QR Code with your smart phone to access the information online or visit http://bit.ly/TTSHHealth-Library

Was this information helpful? Please feel free to email us if you have any feedback regarding what you have just read at patienteducation@ttsh.com.sg

Tan Tock Seng HOSPITAL
National Healthcare Group

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PECC-DIS-ED-2025-2017-v1