Nutrition Guidelines for the

Provision of Healthy and Quality Meals

for Meal Delivery, Home-Based, and Centre-Based Care Providers



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FOREWORD

With the implementation of Healthier SG and Age Well SG to improve the health of ageing residents in Singapore, maintaining good nutrition and ensuring access to healthy and quality meals is critical. This is particularly so for residents who receive care and support at various community and long-term care settings, such as home-based and centre-based care facilities. These elderly residents are reliant on the meals provided to meet their nutritional requirements for their health and well-being.

This publication of nutrition guidelines developed by the Ministry of Health (MOH) Community Dietetics and Nutrition (COMDAN) workgroup marks a significant milestone, as the first national guideline to support the creation and provision of nutritious, high-quality, and enjoyable meals. Drawing from evidence-based nutrition practices, it aims to empower providers with a comprehensive framework and recommendations to enable consistent meal quality to meet the needs of residents and clients. This valuable resource includes menu planning principles, menu construction, to specific guidance for common nutrition-related conditions, and strategies to improve oral intake.

By advocating the adoption of these guidelines and recommendations, we hope to foster a culture of good nutrition care across care facilities. With enhanced awareness and attention from meal and service providers, I am confident that we can inspire and advance nutrition care in the community together to make a positive impact on the health of the population.

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15th November 2024

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INTRODUCTION

This is a nutrition guide for the provision of healthy and quality meals for meal delivery, home-based, and centre-based care providers. Service providers for institutions, including those for meals-on-wheels (MOW), senior day care centres, dementia day care, sheltered homes, destitute homes, assisted living facilities, and nursing homes, can benefit from these guidelines. Given Singapore's ageing population and the declining old-age support ratio, it is anticipated that the number of service recipients in home care, day care, and long-term care facilities will continue to rise.

Both international and local data have shown a higher prevalence of malnutrition in older adults[1-5]. In Singapore, close to 30% of community-dwelling older adults aged ≥55 were at risk of malnutrition or malnourished[6]. The prevalence of malnutrition was highest in long-term care facilities, where 22-39% of nursing home residents are undernourished[7-8].

Malnutrition has been associated with adverse outcomes, including prolonged hospitalisations, hospital readmissions, frailty, institutionalisation, increased healthcare costs, reduced quality of life, impaired functional recovery, and higher mortality rates[1,9-18]. Therefore, it is crucial to prevent malnutrition by providing healthy and quality meals for recipients who receive meals from meal providers.

A local study has shown that the prevalence of chronic diseases increases with age. By age 50, over half of the population had at least one chronic disease, and by age 60, more than half had multiple chronic diseases[19]. The top 10 most prevalent diseases included chronic kidney disease, hypertension, lipid disorders, diabetes, osteoarthritis, asthma, coronary heart disease, renal disease, cancer (without metastasis) and angina[19]. Given that most of these chronic diseases require dietary management, offering healthy and balanced meal guidance becomes essential to meet the nutritional needs of recipients.

Approximately 10% of households in Singapore face food insecurity[20]. Food security encompasses not just economic and physical access to food but also ensuring safe and nutritious food consumption. Individuals experiencing food insecurity are at higher risk of being in the high-risk Body Mass Index (BMI) category (BMI ≥ 27.5 kg/m^2), which puts them at higher risk for weight-related health problems such as type 2 diabetes, hypertension, heart disease, stroke, and bone and joint disorders. This group of people often has limited health awareness, with many not actively seeking healthier food options[20]. It is essential to prioritise efforts to promote access to nutritious foods and healthy eating habits among all residents of Singapore, regardless of their food security status.

In addition to providing energy and nutrients, food also contributes to people's enjoyment of life. Efforts have been made to improve the nutritional value and taste of meals for MOW recipients, day care clients, and nursing home residents. However, there are currently no widely shared guidelines for meal providers. Establishing such guidelines is crucial to ensure that recipients receive healthy, balanced, and high-quality meals that support their nutritional well-being, manage chronic diseases effectively, and enhance overall quality of life.

Objectives for this set of guidelines

- Support service and care providers in the provision of balanced and nutritious meals for clients in home-based and centre-based care settings.
- Guide meal providers on menu planning.
- Provide information on dietary needs for chronic diseases.
- Provide practical dietary strategies to prevent and manage malnutrition.

PRINCIPLES OF HEALTHY EATING

The aim of healthy eating is to encourage the enjoyment of a variety of foods and achieve a balanced diet to meet our daily nutrients and energy requirements. It also helps to:

Maintain independence
Reduce risk of chronic diseases
Reduce risk of malnutrition and frailty
Achieve or maintain a healthy body composition and weight
Achieve good mental health

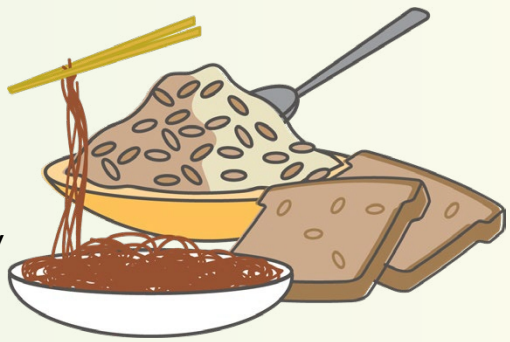
My Healthy Plate

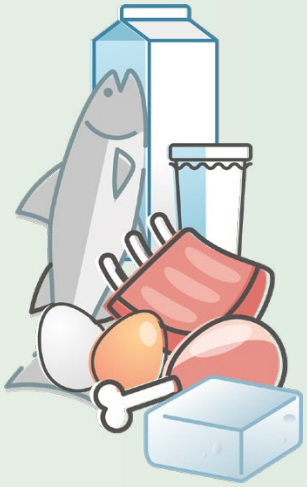
My Healthy Plate is an easy-to-understand visual guide for creating balanced and healthy meals recommended by the Health Promotion Board (HPB). It encourages healthy eating for everyone to promote good health, including people with chronic diseases such as diabetes, hyperlipidaemia, and hypertension. Individuals can use My Healthy Plate to plan healthy meals for breakfast, lunch and dinner.



Fill a quarter of the plate with wholegrains (carbohydrate-rich food)

- Examples: brown rice, wholemeal bread, brown rice bee hoon, rolled oats.
- Benefits: Rich in vitamins, minerals, phytochemicals and dietary fibre. Wholegrains aid in weight management by improving satiety and reducing the need for snacking. They also help individuals with diabetes to control their blood sugar levels.





Fill a quarter of the plate with meat and others (protein-rich food)

- Examples: poultry, seafood, eggs, beans, tofu and soy products, low-fat milk and dairy products.
- Benefits: Provide essential protein and calcium for muscle and bone health.
- Cook meat and plant-based proteins in various ways, such as stir-frying, roasting, steaming, grilling or adding to soups.
- Include oily fish like tuna, mackerel, tenggiri batang, and ikan tenggiri at least 2 times a week.
- Opt for skinless chicken, duck, and lean meat.



Fill half the plate with fruit and vegetables

- Benefits: Low in fat and high in dietary fibre, vitamins, and minerals.
- Cook vegetables in a diverse way, like stir-frying, roasting, steaming, sautéing, or adding to soups.
- Eat fruits whole rather than as juices.

Choose healthier oils

- Use healthier cooking oils for all cooking and food preparation.
- Limit deep-fried foods to less than twice a week.

Limit intake of salt

- Restrict daily salt intake to 1 teaspoon (approximately 5 grams of salt or 2000 mg of sodium). This includes sodium in sauces, table salt, and processed foods.
- Opt for lower-sodium salt*, lower-sodium light and dark soy sauces, oyster sauce and seasonings.
- Enhance flavour with herbs and spices instead of salt, sauces, and seasonings.

**Note: Lower-sodium salt contains potassium chloride in place of some sodium chloride and is not suitable for people with chronic kidney disease*

Limit intake of sugar

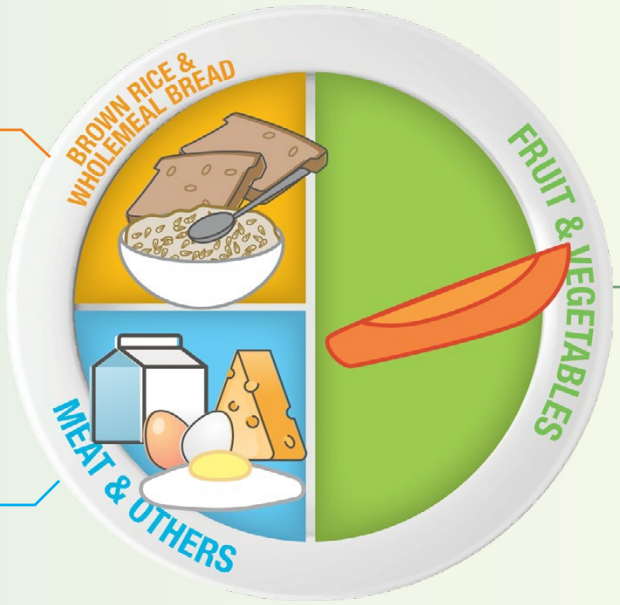
- Restrict daily added sugar intake. Aim for no more than 10 teaspoons per day, with further benefits from reducing to 5 teaspoons.
- Added sugars are found in sweetened drinks, fruit juice, honey, jam as well as processed foods like sweets.
- Be aware that fruit juices contain naturally occurring sugars even if no additional sugar is added.

Guide on planning meal choices for breakfast, lunch and dinner using My Healthy Plate

Planning breakfast using My Healthy Plate

Fill a quarter of your plate with wholemeal bread, wholegrain toast, rolled oats or brown rice porridge

Fill a quarter of your plate with eggs, peanut butter, cheese, low-fat yoghurt, low-fat milk and/or high-calcium soymilk



Leave half the plate empty or have one small piece of fruit

Planning lunch and dinner using My Healthy Plate

Fill a quarter of your plate with brown rice, wholemeal pasta or wholemeal noodle

Fill a quarter of your plate with chicken, fish or lean meat (pork, beef)



Fill half of your plate with bak choy, carrots, broccoli, spinach, capsicums, cabbage, kai lan, kang kong, chye sim AND apple, orange, papaya, banana

How many servings* does a person require a day?

Figure 1: Recommended number of servings per day

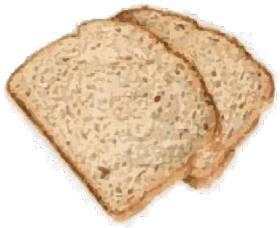
FOOD GROUPS	RECOMMENDED NUMBER OF SERVINGS PER DAY							
	6 months (181 days) –12 months	1- 2 years	3- 6 years	7- 12 years	13- 18 years	19- 50 years	51 years & above	Pregnant & lactating women
Brown rice & Wholemeal Bread	1 - 2	2 - 3	3 - 4	5 - 6	6 - 7	5 - 7	4 - 6	6 - 7
Fruit	½	½ - 1	1	2	2	2	2	2
Vegetables	½	½	1	2	2	2	2	3
Meat & Others	2	2	2	3	3	3	3	3½
of which Dairy foods or Calcium-rich foods	1½	1½	1	1	1	1½	1	1

Source: Health Promotion Board Singapore

**number of serving will vary depending on the person's requirement*

What is an example of a serving for each food group?

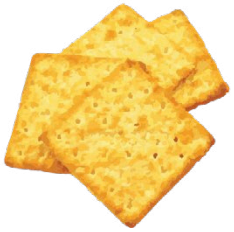
What is an example of 1 serving of brown rice and wholemeal bread



2 slices of wholemeal bread (60g)



½ bowl* of whole-grain noodles, beehoon or spaghetti (100g)



4 plain wholemeal crackers (40g)



½ bowl* of rice/ brown rice (100g)



2 wholemeal chapatis (60g)



1½ cups** of whole-grain breakfast cereals (40g)



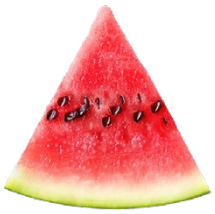
⅔ bowl* of uncooked oatmeal (50g)

**1 rice bowl **250ml cup*

What is an example of 1 serving of fruit?



1 small apple, orange, pear or mango (130g)



1 wedge of papaya, pineapple or watermelon (130g)



10 grapes/ longans (50g)



1 medium banana



¼ cup** of dried fruits



1 glass pure fruit juice (250ml)

***250ml cup*

What is an example of 1 serving of vegetables?



¼ round plate of cooked vegetables



150g raw leafy vegetables



100g raw non-leafy vegetables



¾ mug of cooked leafy (100g)



¾ mug non-leafy vegetables (100g)

What is an example of 1 serving of meat and others?



1 palm-sized piece of lean meat or skinless chicken (90g)



2 glasses of low-fat milk (500ml)



2 small blocks of soft beancurd (170g)



½ piece of taukwa (180g)



¾ cup of cooked red/green/ black/soy beans (120g)



1 palm-sized piece of fish (90g)



¾ cup of cooked pulses (peas, lentils) (120g)



3 eggs (150g)



4 pieces of tempeh or ¾ small bowl of chopped tempeh (120g)



1 cup for mixed nuts trail (120g)

Table 1: Additional examples of food choices for each food group

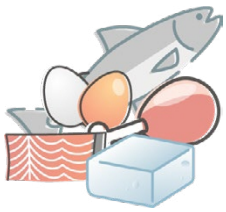
Brown rice and wholemeal

- Brown rice
- Brown rice bee hoon
- Brown rice noodle
- Whole wheat pasta
- Chapati
- Wholemeal bread
- Oat
- Barley
- Corn
- Millet
- Quinoa
- Buckwheat



Meat and others

- Eggs
- Fish
- Chicken without skin
- Duck without skin
- Prawn
- Lean meat
- Tofu
- Tempeh
- Soybean
- Beancurd skin
- Chickpea
- Black bean
- Black eye pea
- Green pea
- Lentils
- Edamame
- Kidney bean
- Green bean
- Red bean
- Low-fat milk
- High-calcium soy milk



Vegetables

- Green leafy vegetables e.g., chye sim, spinach, kai lan
- Tomato
- Mushrooms
- Brinjal
- Long bean, lady finger, broad bean, French bean, snow pea.
- Gourds e.g., hairy gourd, bitter gourd, cucumber.
- Sprouts e.g, soybean sprout, mung bean sprout (taugeh)
- *Root vegetables e.g., potato, sweet potato, tapioca, carrot, lotus root
- *Pumpkin



Fruits

- Apple
- Banana
- Dragon fruit
- Guava
- Honeydew
- Kiwi
- Mango
- Orange
- Papaya
- Pear
- Pineapple
- Watermelon



Healthier Oil/fat

- Canola oil
- Corn oil
- Olive oil
- Peanut oil
- Rice bran oil
- Sunflower oil
- Nuts and seeds e.g.,almond, cashew nut, pumpkin seed, sesame seed, walnut.



these are starchy vegetables, containing higher amounts of carbohydrate

If a specific food item is unavailable on the day's menu, a suitable substitute from the same food group should be provided

MEAL ISSUES FOR
MEAL DELIVERY, HOME-BASED AND CENTRE-BASED MEAL PROVIDERS



Meal delivery services play a crucial role in ensuring that older adults receive healthy, quality, and balanced meals, whether they are living independently at home, staying at an assisted living facility or nursing home, or attending a day care centre or active ageing centre. These services not only address seniors' dietary needs but also contribute to their overall well-being by providing opportunities for social interaction.

Providing healthy and quality meals to older adults, whether in a centre-based setting or through home delivery, may present with unique challenges and opportunities (Table 2). Both types of meal services aim to address the nutritional needs of seniors, but they face distinct difficulties that can impact their effectiveness. By addressing the unique challenges and implementing targeted recommendations, these services can continue to provide high-quality, nutritious meals while enhancing the overall quality of life for seniors. Ongoing evaluation and adaptation of these programmes will ensure they meet the evolving needs of the ageing population.

Meal Issues for Meal Delivery, Centre-based and Home-based Meal Providers

Table 2: Current and potential issues faced by centre-based and home-based meal providers and recommendations

Types of Facilities	Potential /Current Issues	Recommendations
Home-based (MOW)	**Mismatched Meal Timing:** Meals are sometimes delivered at times that do not align with clients' usual eating schedules. **Food Safety Concerns:** Meals may be left unattended at the doorknobs when clients are not home, posing a risk to food safety if meals are not consumed within the recommended time frame. **Unmet Dietary Needs:** Clients with difficulties in chewing or swallowing, or those with chronic diseases, may receive inappropriate meals for their dietary needs, such as regular-textured foods or meals high in sodium, fat, and sugar. **Cultural and Personal Preference Mismatches:** Clients may receive meals that do not align with their cultural background or personal preferences, particularly in a multicultural setting like Singapore.	**Align Delivery with Clients' Schedules:** Coordinate delivery times more closely with clients' regular mealtimes to ensure meals are consumed when fresh. **Enhance Food Safety Protocols:** Ensure meals are not left unattended. Implement a notification system to confirm clients are home during delivery, and consider separate deliveries for lunch and dinner to avoid prolonged exposure of meals. **Customise Meals to Individual Needs:** Conduct regular assessments of clients' dietary requirements to provide appropriate meals, including texture-modified options and those tailored to specific health conditions. Train meal providers to prepare texture-modified diet and common therapeutic diet such as diabetic diet, low-fat diet, or low-salt diet. **Offer Culturally Appropriate Meals:** Provide a variety of meal options that respect the cultural and personal preferences of clients. Regularly collect feedback to adjust meal offerings accordingly.



Table 2: Current and potential issues faced by centre-based and home-based meal providers and recommendations (continued)

Types of Facilities	Potential /Current Issues	Recommendations
Centre-based Day Care Centres, Dementia Day Care Centres, Day Rehabilitation Centres, Senior Care Centres or Active Ageing Hubs.	**Under-detection of Nutritional Risk:** Some clients may be at risk of poor nutrition and may not be appropriately identified for follow-up care. **Food Safety and Hygiene:** Food handling, storage, and preparation practices may not always adhere to the highest safety standards. **Limited Meal Variety:** Clients may face monotonous meal options that do not fully cater to their dietary needs or preferences, potentially affecting their nutritional intake and overall satisfaction.	**Implement Regular Nutritional Screening:** Ensure consistent screening of clients to identify those at risk of poor nutrition and provide timely interventions. **Adhere to Strict Food Safety Standards:** Continuously review and improve food handling, storage, and preparation protocols to maintain high standards of hygiene and safety. **Diversify Meal Options:** To improve client satisfaction and nutrition, offer a variety of nutritious meal choices that cater to different dietary needs, including vegetarian, vegan, and halal options.
Assisted living facility	**Variable Care Needs:** Residents have diverse levels of care needs, from those who are mostly independent to those requiring full support, which may not always be adequately addressed in meal provision. **Reliance on Volunteers and Donations:** Some meal programmes rely heavily on volunteer management and food donations, which can impact the consistency and quality of meals provided.	**Provide Flexible Meal Services:** Tailor meal services to accommodate residents' varying levels of care needs, ensuring that both independent and dependent individuals receive appropriate support. **Strengthen Community Partnerships:** Engage with local communities and volunteers to improve meal service consistency, ensuring that meals are nutritious, culturally appropriate, and responsive to residents' preferences.



Table 2: Current and potential issues faced by centre-based and home-based meal providers and recommendations (continued)

Types of Facilities	Potential /Current Issues	Recommendations
Nursing homes	**Nutrient Deficiencies:** Meals provided in nursing homes may lack essential nutrients such as vitamin B6, B12, C, D, E and minerals like calcium, magnesium, and zinc, contributing to malnutrition[21-23]. **Limited Choice and Lack of Satisfaction:** Residents often face limited meal choices, leading to dissatisfaction, which can negatively impact their overall well-being and increase the risk of malnutrition[23-25]. **Infrequent Nutritional Assessments:** Nutritional assessments may not be conducted regularly enough to address the changing needs of residents, potentially leading to unaddressed dietary deficiencies.	**Enhance the Nutrient Content of Meals:** Ensure that meals meet recommended nutrient levels, particularly focusing on vitamins and minerals essential for older adults. Work with dietitians to ensure adequate nutrition provision. **Foster Social Dining Experiences:** Recognise the importance of meals as a social activity and provide dining environments that encourage social interaction and resident autonomy in meal choices. **Offer Diverse and Enjoyable Meal Options:** Regularly update and diversify the menu to include local favourites and cater to special dietary requirements, reducing meal monotony and enhancing residents' meal satisfaction. **Conduct Regular Nutritional Assessments:** Implement biannual nutritional screenings and ensure prompt referrals to dietitians for residents with identified nutritional risks, adjusting meal plans accordingly.



MENU PLANNING

Food is more than sustenance. It is also an expression of a person's identity and autonomy of what to eat, when to eat, and whom to eat with. Both the food provided and the dining environments in nursing homes, assisted living facilities, and day care centres should be tailored to meet the nutritional and psychosocial needs of residents. This includes accommodating those with higher protein and energy requirements and individuals who require texture-modified meals. It is important to offer residents a variety of meal options to enhance their dining experience. High standards of nutrition and food service are crucial to promote the health and well-being of elderly residents.

It is recommended that all clients receive a balanced diet incorporating the food groups outlined in My Healthy Plate during each main meal: (i) whole grains such as brown rice and wholemeal bread, (ii) protein sources including meat and alternatives, and (iii) fruits and vegetables. The recommended serving sizes for each food group, for the 1200kcal, 1500kcal, and 1800kcal diet, are shown in Table 3. Appendix J shows the comparison of food group distribution for 1200kcal, 1500kcal and 1800kcal in HPB's serving size and food exchange format. Please consult dietitian for therapeutic diet planning.



Table 3: Meal planning based on the serving size recommended in a day

(a) Meal plan for 1200kcal					
	Breakfast	Lunch	Afternoon tea	Dinner	Supper
Brown rice & wholemeal bread	1	1	½	1	½
Fruits		1		1	
Vegetables		1		1	
Meat & others		1		1	
Dairy foods or calcium-rich foods	½				½

(b) Meal plan for 1500kcal					
	Breakfast	Lunch	Afternoon tea	Dinner	Supper
Brown rice & wholemeal bread	1	1 ½	½	1 ½	½
Fruits		1		1	
Vegetables		1		1	
Meat & others		1		1	
Dairy foods or calcium-rich foods	½				½

(c) Meal plan for 1800kcal					
	Breakfast	Lunch	Afternoon tea	Dinner	Supper
Brown rice & wholemeal bread	1	2	½	2	½
Fruits		1		1	
Vegetables		1		1	
Meat & others		1		1	
Dairy foods or calcium-rich foods	½				½

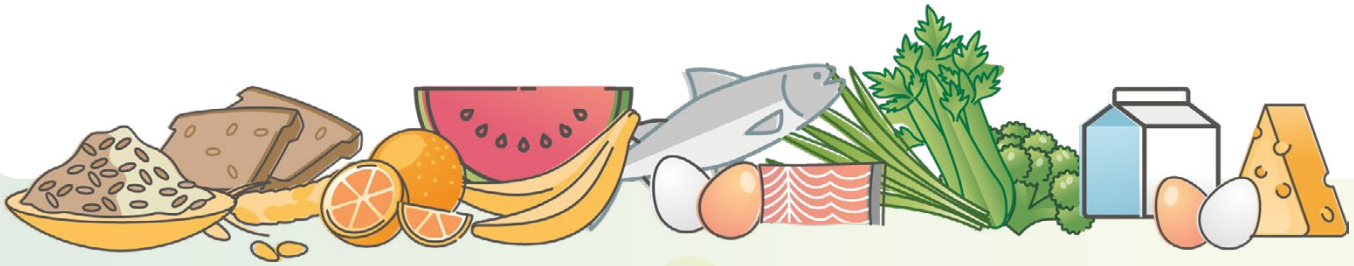


Table 4 shows the calorie distribution at main meals and snacks for home-based and centre-based meal providers, while Table 5 presents the recommended calorie distribution at main meals and snacks for nursing homes for 1200kcal, 1500kcal, and 1800kcal diets.

Table 4: Recommended calorie distribution at main meal and snacks for home-based and centre-based meal providers

	Breakfast	Lunch	Snack	Dinner	Snack
Meals-on -wheel	–	500-600kcal	–	500-600kcal	–
Day Care	400-500kcal	500-600kcal	100-200kcal	–	–
Nursing Homes	400-500kcal	500-600kcal	100-200kcal	500-600kcal	100-200kcal

This is based on a daily requirement of 1800kcal a day.

Table 5: Recommended calorie distribution at main meals and snacks for nursing home at 1200kcal, 1500kcal and 1800kcal

	Breakfast	Lunch	Snack	Dinner	Snack
1200kcal	300kcal	350kcal	100kcal	350kcal	100kcal
1500kcal	300-400kcal	400-500kcal	100-150kcal	400-500kcal	100-150kcal
1800kcal	400-500kcal	500-600kcal	100-200kcal	500-600kcal	100-200kcal

The nutrient requirements for individuals aged 60 and above are used as the benchmark to ensure adequate nutrition for all clients. This approach aims to promote overall health and well-being through a well-rounded and nutritious diet. Table 6 displays the targeted nutrients for a day and per meal, with each meal providing one-third of daily

requirements. It is recommended that long-term care facilities distribute nutrient intake across three meals and two snacks daily. The suggested distribution is 20% of nutrient requirements at breakfast, 30% at lunch, 30% at dinner, and 10% at each snack.

Table 6: Nutrient targets for a home-delivered or centre-based meal in a day and in a meal

Nutrients	Recommended intake in a day	Recommended intake in a meal
Energy	1800kcal	500-600 kcal
Protein	75g	At least 20g
Iron	8mg	2.7mg
Vitamin A (retinol equivalent)	750mcg	350mcg
Vitamin D	25mcg or 1000IU	8.3mcg or 334IU
Vitamin E	15mg	5mg
Thiamine	0.98mg	0.33mg
Vitamin B6	1.7mg	0.57mg
Vitamin B12	2.4mcg	0.8mcg
Ascorbic acid	105mg	35mg
Folic acid	400mcg	133mcg
Calcium	1,000mg	333mg
Magnesium	260mg	87mg
Potassium	4700mg	1567mg
Zinc	11mg	3.7mg

Reference from Health Promotion Board Singapore and World Health Organization & Food and Agriculture Organization of The United Nations[26-27]

The recommended nutrient target per meal is based on the assumption that the individual consumes three equal meals per day. These nutrient targets can be achieved as an average over a one-week menu cycle. Refer to Appendix A for food sources of iron, folic acid, vitamin B12, calcium, and vitamin D.

Menu planning principles

Menu planning should encompass these three important considerations: (i) characteristics, needs, and preferences of those in care, (ii) nutritional content, variety, and balance; and (iii) practicalities of production.

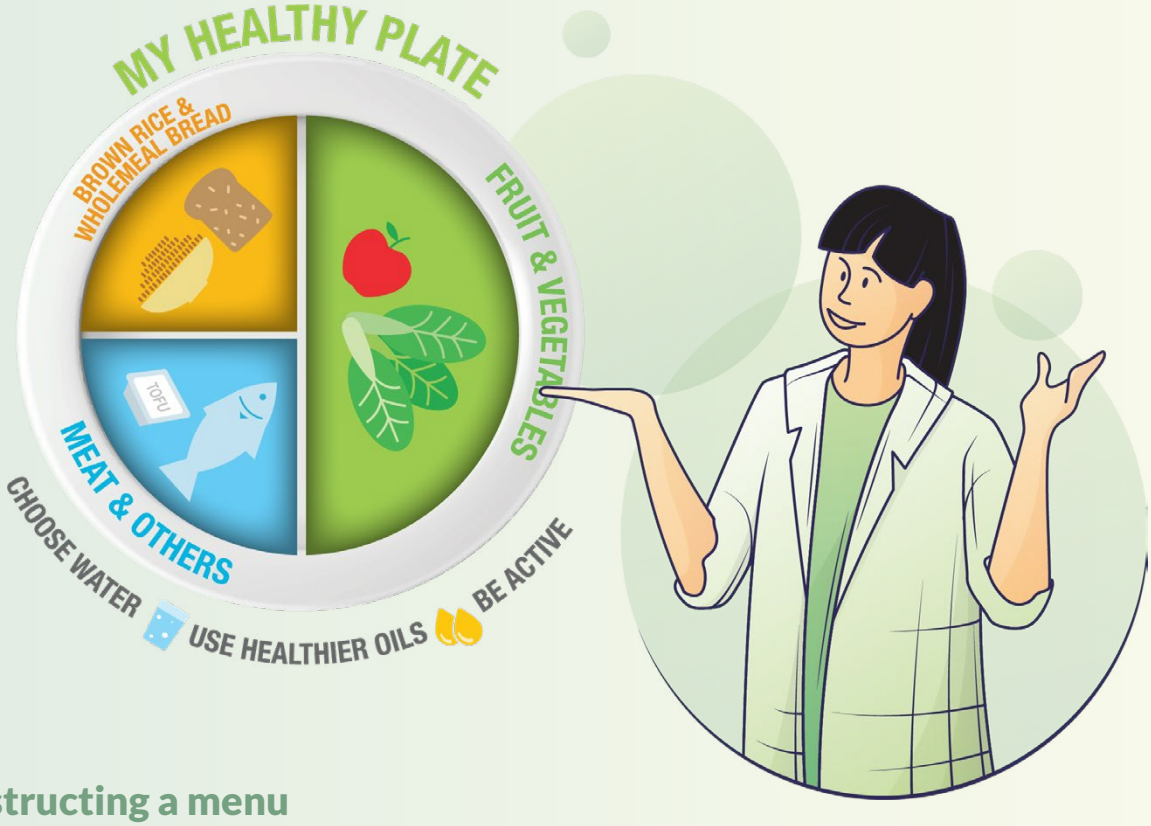
The following are important factors to consider when planning menus for home-based and centre-based care providers.



- Cycle menus should be planned and revised on a regular basis, at least annually and endorsed by a dietitian.
- The menu cycle should be at least 2-6 weeks cycle to ensure optimal variety[28]. The recommended menu cycle is:

Menu cycle (at least)	Facility	Average length of stay
2 weeks	Centre-based likes Day Care Centres, Dementia Day Care Centres, Day Rehabilitation Centres, Senior Care Centres or Active Ageing Hubs.	7 days or fewer
4 weeks		More than 7 days but less than 3 months
6 weeks	Assisted living facilities, meals-on-wheels providers, nursing homes	More than 3 months

- Food should be presented in an appealing way. Meals should include a variety of different food colours, textures, and shapes.
- To ensure adequate nutrient provision, alternative food needs to be provided to clients with food allergies or intolerances.
- Menu choices should be available for all, including residents on therapeutic diets and texture-modified diets. Liberalise therapeutic diets for those with poor intake, as therapeutic diets may limit food choices. This should be done in consultation with the dietitian.



Constructing a menu

The menu presented below expands on the My Healthy Plate model and the guidelines discussed earlier. It is a straightforward, select-choice menu that illustrates how to construct a menu based on principles involving variety, food groups, textures, and nutritional content of each dish. Table 7 offers a one-week example of a menu crafted according to the recommendations outlined in this guideline. Table 8 shows the meal planning for 1200kcal, 1500kcal, and 1800kcal diets in a day. The meal plans in Table 8 are planned according to the recommended serving size distribution stated in Table 3.

The menu provides a general guidance based on multi-ethnic Singapore, and the meal provider should adapt it accordingly. Lunch and dinner should each contain a minimum of 20g of protein. Refer to Appendix B for a list of carbohydrates, proteins, fruits, and vegetables and their recommended serving sizes. It is important to incorporate a variety of carbohydrates, proteins, fruits, and vegetables into the daily diet. When planning a menu, meal providers should provide a suitable substitute if a specific food item is unavailable. Meal providers should seek inputs from dietitians on how to include variety and provide balanced meals.

Menu development standards

Menu development standards for meals on wheels, day care centre, and nursing homes are crucial to ensure that the meals provided meet the nutritional needs and preferences of the populations they serve. These standards help maintain consistency, safety, and quality in meal preparation and delivery.

a. Determine the duration of your menu cycle.
b. Compile a list of all items intended for use on your menu.
c. Categorise each item based on its meal component (e.g., main hot protein, soup, sandwiches, dessert, snacks) into the most suitable group.
d. Record the recommended serving size ranges for each food group.
e. Ensure sufficient quantities of meal items are available for your menu to ensure nutritional adequacy.
f. Incorporate considerations for halal, non-halal, and vegetarian options in menu planning.
g. Identify which diets can be accommodated within the main menu and which require separate menus (e.g., therapeutic diet, texture-modified diet, vegetarian diet, food allergies or intolerances).
h. Utilise the gathered information to begin developing your master menu—a comprehensive guide in the kitchen detailing all available choices catering to different dietary requirements.

Adhering to the above principles will not necessarily guarantee that what is offered will meet clients' expectations or be considered high-quality—a term hard to define at the best of times. Quality meals start with a good recipe and quality ingredients. Refer to Appendix C for menu checklist.



Table 7: A one-week sample of a simplified menu for a meal (Level 7 regular texture)

(a) 1200kcal

Meal component	Serving size (household measurement)	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Brown rice & wholemeal bread (wholegrains)	**1** (½ rice bowl ~100g cooked food)	Brown rice	Bee hoon	Noodle soup	Chapati	Brown rice	Fried rice	Fish porridge
Meat & others (main course)	**1** (1 palm size ~ 90g cooked meat or ¾ rice bowl ~ 120g cooked legumes)	Roast chicken	Fish fillet	Fish slices	Curry lentils	Sambal goreng (taukwa and tempeh)	Minced meat and egg	Fish slices
Vegetables	**1** (¾ rice bowl ~ 100g cooked vegetable)	Stir-fried chye sim	Curry vegetable (brinjal, long bean, lady finger)	Xiao bai chye and tomato	Stir-fried long bean	ABC soup	Cabbage, carrot and long bean	Chinese cabbage, carrot
Fruits	**1** (130g apple/orange/ papaya/pineapple/ watermelon)	Banana	Papaya	Apple	Water-melon	Dragon fruit	Pear	Pineapple
Remark	–	–	–	**One dish meal**	–	–	**One dish meal**	**One dish meal**

(b) 1500kcal

Meal component	Serving size (household measurement)	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Brown rice & wholemeal bread (wholegrains)	**1 ½** (¾ rice bowl ~150g cooked food)	Brown rice	Bee hoon	Noodle soup	Chapati	Brown rice	Fried rice	Fish porridge
Meat & others (main course)	**1** (1 palm size ~ 90g cooked meat or ¾ rice bowl ~ 120g cooked legumes)	Roast chicken	Fish fillet	Fish slices	Curry lentils	Sambal goreng (taukwa and tempeh)	Minced meat and egg	Fish slices
Vegetables	**1** (¾ rice bowl ~ 100g cooked vegetable)	Stir-fried chye sim	Curry vegetable (brinjal, long bean, lady finger)	Xiao bai chye and tomato	Stir-fried long bean	ABC soup	Cabbage, carrot and long bean	Chinese cabbage, carrot
Fruits	**1** (130g apple/orange/ papaya/pineapple/ watermelon)	Banana	Papaya	Apple	Water-melon	Dragon fruit	Pear	Pineapple
Remark	–	–	–	**One dish meal**	–	–	**One dish meal**	**One dish meal**

(C) 1800kcal								
Meal component	**Serving size** (household measurement)	**Mon**	**Tues**	**Wed**	**Thurs**	**Fri**	**Sat**	**Sun**
Brown rice & wholemeal bread (wholegrains)	**2** (1 rice bowl ~200g cooked food)	Brown rice	Bee hoon	Noodle soup	Chapati	Brown rice	Fried rice	Fish porridge
Meat & others (main course)	**1** (1 palm size ~ 90g cooked meat or ¾ rice bowl ~ 120g cooked legumes)	Roast chicken	Fish fillet	Fish slices	Curry lentils	Sambal goreng (taukwa and tempeh)	Minced meat and egg	Fish slices
Vegetables	**1** (¾ rice bowl ~ 100g cooked vegetable)	Stir-fried chye sim	Curry vegetable (brinjal, long bean, lady finger)	Xiao bai chye and tomato	Stir-fried long bean	ABC soup	Cabbage, carrot and long bean	Chinese cabbage, carrot
Fruits	**1** (130g apple/orange/ papaya/pineapple/ watermelon)	Banana	Papaya	Apple	Water-melon	Dragon fruit	Pear	Pineapple
Remark	–	–	–	**One dish meal**	–	–	**One dish meal**	**One dish meal**



Table 8: Example of menu planning for a day

(a) 1200kcal with 3 servings of protein					
Meal	**Brown rice & wholemeal bread**	**Meat and others**	**Dairy foods or calcium-rich food**	**Vegetables**	**Fruits**
Breakfast 	1 bowl of oat (50g uncooked oat)	–	1 glass low-fat milk (200ml) 	–	–
Lunch (fish slice noodle soup) 	½ bowl of noodle (100g noodle)	100g of fish slice	–	100g of cooked chye sim	1 slice water-melon (220g) 
Afternoon tea 	1 slice of bread with peanut butter	–	–	–	–
Dinner 	½ bowl of rice (100g rice)	1 palm size of chicken (90g fish)	–	100g of cooked lady finger	1 small banana (9-10cm) 
Supper 	3 pieces of biscuit	–	1 glass low-fat milk (200ml) 	–	–

Table 8: Example of menu planning for a day (continued)

(a) 1500kcal with 3 servings of protein					
Meal	**Brown rice & wholemeal bread**	**Meat and others**	**Dairy foods or calcium-rich food**	**Vegetables**	**Fruits**
Breakfast 	1 bowl of oat (50g uncooked oat)	–	1 glass low-fat milk (200ml) 	–	–
Lunch (fish slice noodle soup) 	¾ bowl of noodle (150g noodle)	100g of fish slice	–	100g of cooked chye sim	1 slice water-melon (220g) 
Afternoon tea 	1 slice of bread with peanut butter	–	–	–	–
Dinner 	¾ bowl of rice (150g rice)	1 palm size of chicken (90g fish)	–	100g of cooked lady finger	1 small banana (9-10cm) 
Supper 	3 pieces of biscuit	–	1 glass low-fat milk (200ml) 	–	–

Table 8: Example of menu planning for a day (continued)

(a) 1800kcal with 3 servings of protein					
Meal	Brown rice & wholemeal bread	Meat and others	Dairy foods or calcium-rich food	Vegetables	Fruits
Breakfast 	1 bowl of oat (50g uncooked oat)	–	1 glass low-fat milk (200ml) 	–	–
Lunch (fish slice noodle soup) 	1 bowl of noodle (200g noodle)	100g of fish slice	–	100g of cooked chye sim	1 slice water-melon (220g) 
Afternoon tea 	1 slice of bread with peanut butter	–	–	–	–
Dinner 	1 bowl of rice (200g rice)	1 palm size of chicken (90g fish)	–	100g of cooked lady finger	1 small banana (9-10cm) 
Supper 	3 pieces of biscuit	–	1 glass low-fat milk (200ml) 	–	–

Recipes

Recipes should be standardised and regularly reviewed. Most chefs and cooks are continually refining dishes, and these improvements should be reflected in updated recipes.

- Recipes must accurately reflect portion sizes to ensure sufficient key nutrients are given. Consistent standard serving sizes should be established, followed, and regularly reassessed. This should be done in consideration of therapeutic requirements with dietitian's consultation.
- It is also critical that ingredients are used consistently and that potential allergens are identified and communicated to clients.
- Whenever feasible, recipes should be adjusted to increase nutritional density. For example, adding high-calcium soymilk powder to green bean soup can boost protein, calcium, and energy content, while cooking oil can increase total energy content of the meal.
- Recipes should be adjusted based on customer feedback. Establishing a robust customer feedback process is vital for all services. Constructive feedback should be encouraged, as it is typically valued by kitchen staff, whether they work in a renowned restaurant or a small center-based kitchen.

Analysis of recipes

Several nutrient analysis software programs are available to analyse standard recipes for the nutrients provided per serving. The key nutrients are outlined in Table 6 (nutritional targets). Specific software tools for nutrient analysis:



- FoodWorks (for Australian and New Zealand market)
- Genesis of ESHA Research (For U.S. market)
- Nutritionist Pro (For U.S. market, commercial version)

If a food service provider does not have access to nutrient analysis software to review their recipes fully, they can engage a food service executive or nutritionist to use the following nutrient databases to calculate the average nutrient contents of their recipes:

- Energy and Nutrient Composition of Food by Health Promotion Board, https://focos.hpb.gov.sg/eservices/ENCF/
- FoodData Central by U.S. Department of Agriculture, https://fdc.nal.usda.gov
- Nutrition Panel Calculator by Food Standards Australia New Zealand (FSANZ), https://npc.foodstandards.gov.au/ManageRecipes.aspx
- Malaysian Food Composition Database (MyFCD), https://myfcd.moh.gov.my/myfcdcurrent/
- Nutrient Information Inquiry by Hong Kong Centre for Food Safety, https://www.cfs.gov.hk/english/nutrient/index.php



Ingredients

Ingredients are an important part of quality, and their use depends on availability and accessibility, which may be limited by funding or rely on donations. In general, service providers should use fresh ingredients as much as possible. Some considerations are listed below:

a. Serve wholegrains when appropriate.

b. Serve fish at least twice a week. Encourage serving fish that is a good source of omega-3 fat, e.g. sardines, barred Spanish mackerel (ikan tenggiri batang), anchovy, tuna, codfish, salmon, and mackerel (saba). Serve without bones to minimise the risk of choking.

c. Serve calcium-rich or calcium-fortified foods, e.g. dairy, tofu, ikan bilis*, on a daily basis.

**Ikan bilis is high in sodium (salt), suggest to soak and drain before cooking to reduce the sodium content.*

d. Serve lean cuts of meat.

e. Use cooking oils that contain lower levels of saturated fat and trans fat (refer to Table 1 for healthier cooking oil options).

f. Season dishes with fresh ingredients, such as herbs, spices, garlic, onion, and Chinese mushroom, instead of salt and sauces.

g. Use healthier cooking methods, such as steaming, boiling, grilling, baking, stewing, and stir-frying, instead of deep-frying.

h. Serve food of different colours to enhance the visual appeal.

i. Keep food of different colours separated, especially for texture-modified diet.

j. Fresh stock is preferred; however, it may be beyond the scope of many kitchens. Good quality vegetable stock (cubes or liquid) is often lower in salt (sodium) and is preferable to chicken or beef stock.

k. Packet/tinned soup powder or mix is not recommended. Ideally, all soups should be made from scratch, if possible.

l. Include gravy with little or no artificial (stock cube) flavouring added. Gravy enhances the flavours, influences the texture, and also adds moisture to the meal. This can be very important for older adults who may have dry mouths or experience problems with chewing due to sore mouths or poor dentition.

m. The vegetable component of the meal can be planned closer to the time to allow for seasonal fluctuations in availability, quality, and price. Vegetables should be fresh whenever possible. A range of coloured vegetables (white, green, orange, red, purple or yellow) should be included. A range of colours ensures a range of nutrients. Contrasting colours are also more visually appealing. As a rule, each main meal should be accompanied by one green, plus another coloured vegetable.



Managing presentation and meal enjoyment

Managing meal presentation and enjoyment involves a combination of visual appeal, taste, and the overall dining experience. Here are some tips to help you enhance both the presentation and enjoyment of meals:

Focus on Food Presentation

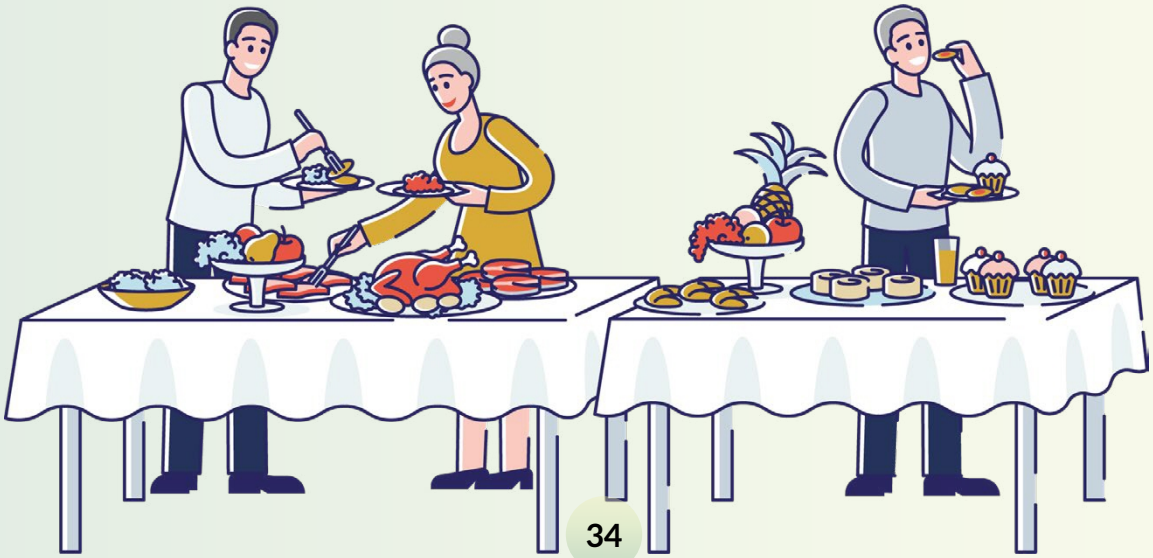
- Balance and Composition: Arrange food on the plate with a balance of colours, textures, and shapes. Use contrasting colours and shape to make the dish visually appealing.
- Plating Techniques: Use clean, stylish plates and avoid overcrowding. Create height and dimension by stacking or layering components.
- Garnishing: Add garnishes like fresh herbs, or citrus zest to enhance the appearance and flavour of the dish.

Enhance the Dining Experience

- Ambience: Set the mood with appropriate lighting, music, and table settings. A pleasant environment can significantly enhance the enjoyment of a meal.
- Engagement: Encourage social interaction during meals. Sharing stories and experiences can make dining more enjoyable and memorable.

Prioritise Taste and Quality

- Fresh Ingredients: Use high-quality fresh ingredients to ensure the best taste and texture.
- Seasoning: Properly season your dishes to enhance their natural flavours. Taste as you cook to adjust seasoning as needed.



Consider Special Needs

• Dietary Preferences: Be mindful of any dietary restrictions or preferences. Offering a variety of options can cater to different tastes and needs.

• Texture Modification: For individuals with dysphagia or other swallowing difficulties, modify the texture of foods to ensure they are safe and enjoyable to eat.

Continuous Improvement

• Feedback: Regularly seek feedback from those you serve to understand their preferences and areas for improvement.

• Innovation: Stay updated with new trends and techniques in food presentation and culinary arts to keep your meals exciting and appealing.

Food Safety

Meal providers should provide food that is handled, stored and prepared in a safe and hygienic manner. Food-borne illnesses, often caused by the consumption of undercooked or unhygienic food, can harm frail clients with lower immunity. It is important that meal providers only accept donated food that is in good condition and fit for consumption.

As part of some centres' day care programs or initiatives at nursing homes to involve residents in making food, baking or cooking may be included as a social activity where clients can take part in creating a dish/dessert with other clients. With a staff trained in food safety and hygiene to oversee the process, clients are protected from food-borne illnesses due to unhygienic food preparation practices.

Good Practices

- The centre ensures that all staff overseeing staff, volunteers, or clients preparing or handling food are trained in food safety principles
  - Please refer to Information for Food Handlers (Singapore Food Agency) (SFA) for more information on the Food Safety Course Level 1.
  - SFA recommends that attendees take a refresher course 5 years after the initial course and another refresher 10 years after completing the last refresher training.

- The centre keeps premises for food storage and preparation clean and pest-free through the following measures:
  • Identifying a suitable area that is pest-proof, sheltered from weather elements, and easy-to-clean for disposal of refuse and food waste
  • Regular cleaning of premises
  • Discarding food waste in sealed containers
  • Contracting a pest control company for regular pest control programmes at least once every 6 months

- Food should be served at the appropriate temperature. Hot food should be kept piping hot (above 60°C), and cold food should be kept in the fridge (below 5°C) until it is time to eat (refer to **Singapore Food Safety Standards**).

- For more information on cleaning food preparation area, please refer to **Good Cleaning and Sanitation Practices (NEA)**.

- Catered food is consumed within the stipulated timeframe as stated by the food company to prevent spoilage of food. For more information, please refer to **Guidelines for Ordering Catered Meals for Functions and Events (NEA)**.



- The centre inspects donated food items upon receiving and only accepts food that is fit for consumption and of good quality to the clients. Examples of items that should be rejected and discarded:
  - Food that has passed the expiry date or best-before date
  - Canned food that is rusty, dented, leaking
  - Fresh produce that shows signs of decomposition
  - Food items that are half-eaten, e.g. opened bottle of sauce
  - Food item or produce transported at inappropriate temperatures, e.g. half-thawed frozen food upon arrival

- In the interest of food safety, the centre does the following:
  - Only accept donated food that is sealed or unopened in original packaging from known caterers or vendors
  - Does not serve cooked food from unknown sources
  - Discourage the sharing of home-cooked food among seniors, as far as possible

- The centre manages and documents each food-related incident (e.g. food poisoning and food contamination) promptly. For food poisoning outbreak that involves five or more persons, the centre manager informs MOH, SFA and Agency of Integrated Care (AIC) account manager.
  - AIC appoints a third-party auditor to conduct a food safety assessment for community care partners. The assessment is based on SFA's food hygiene requirements and comes at no cost to the centre. Centres may contact respective account managers to indicate interest in the food safety assessment.



Special diet

Vegetarian diet

A vegetarian diet is a dietary pattern that emphasises on plant-based foods while excluding meat, poultry, and seafood. This diet can vary depending on individual preferences and cultural practices. There are several variations of vegetarianism, including:



- Lacto-ovo-vegetarian diet: This diet excludes meat, poultry, and seafood but includes eggs and dairy products.
- Lacto-vegetarian diet: This diet excludes meat, poultry, seafood, and eggs but includes dairy products.
- Ovo-vegetarian diet: This diet excludes meat, poultry, seafood, and dairy products but includes eggs.
- Vegan diet: This diet excludes meat, poultry, seafood, egg and dairy.
- Buddhist vegetarian: This diet excludes meat, poultry, seafood, and alliums such as onion, garlic, scallion, shallot, leek, and chives. This diet may include eggs and dairy.

When appropriately planned, vegetarian diets can be nutritionally adequate, provide health benefits in the prevention and treatment of certain diseases, and are appropriate for individuals during all stages of the life cycle[29]. It is advisable for meal service providers to consult a dietitian to ensure that their meals adequately complement their clients' overall dietary needs.

Texture-modified diet

Texture-modified diets are designed for individuals who have difficulties in chewing and swallowing, often due to conditions like dysphagia. These texture-modified diets are safer and easier to consume, reducing the risk of choking and aspiration. Individuals

with dysphagia are five times more prone to undernutrition due to reduced palatability and acceptance of this diet. Texture-modified diets tend to be poorer in calories, protein and micronutrients than regular diets[33-35] and less attractive[36] if not carefully planned.

It is important to engage a qualified dietitian to ensure that texture-modified diets are planned carefully to ensure their nutritional adequacy. These include:

- Incorporate high-calorie and high-protein ingredients to ensure nutritional adequacy. Use fortified foods and supplements if necessary.
- Enhance the visual appeal of meals by using molds or garnishes, which can improve the presentation.
- Provide the appropriate diet and fluid consistency to your clients based on the recommendation of a doctor and/or speech therapist. The foods and drinks should be aligned with the International Dysphagia Diet Standardisation Initiative (IDDSI) framework to ensure consistent and safe food textures (Figure 2). Meal providers can refer to EatSafe SG Resource List for Food Preparation[37] at https://www.moh.gov.sg/hpp/allied-health-professionals/eatsafe-sg
- Conduct regular assessment for residents and clients on texture-modified diet and refer to dietitian if there is significant weight loss.

Figure 2: International Dysphagia Diet Standardisation Initiative (IDDSI) Framework



NUTRITION SCREENING

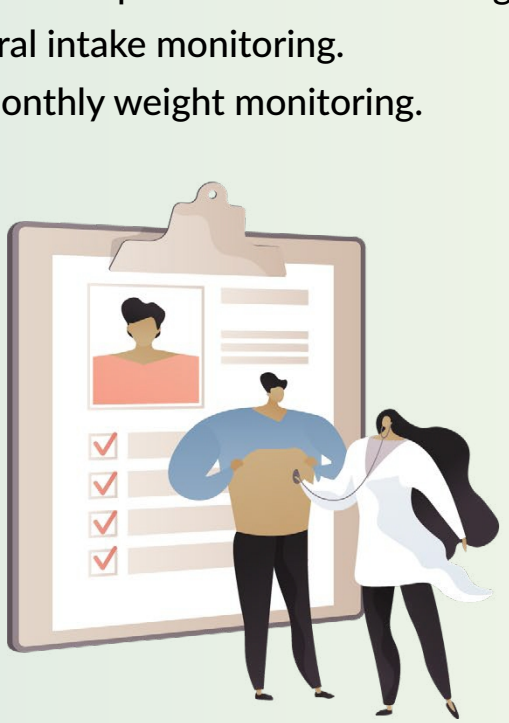
It is recommended that day care centres, assisted living facilities, and nursing homes conduct regular nutrition screenings for each client or resident. Those who are at risk of poor nutrition should receive appropriate assessment and follow-up as per the EatWise Framework (refer to Appendix D), including provision of suitable meal strategies and food options.

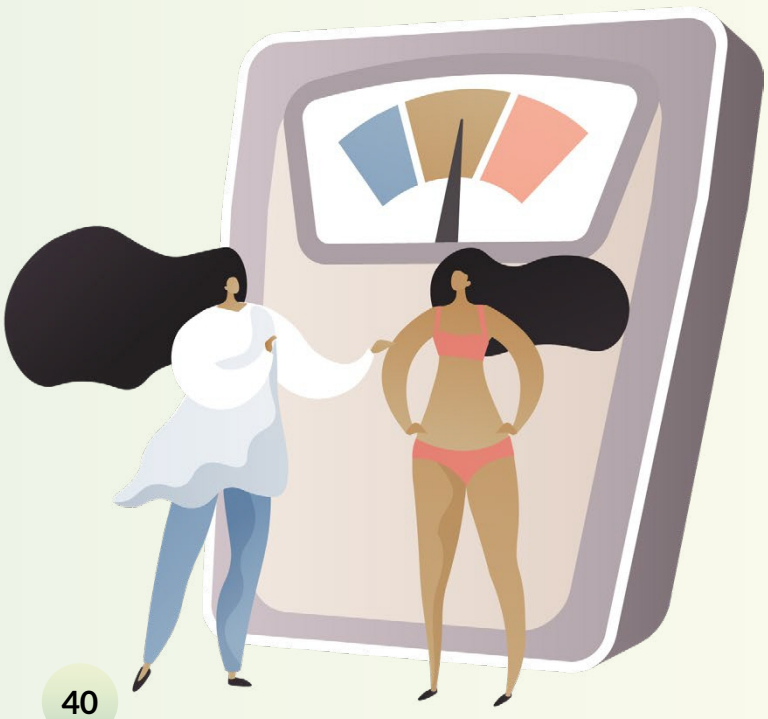
Validated nutrition screening tools (refer to Appendix E):

- 3-Minute Nutrition Screening (3-MinNS)
- Nutritional Screening Tool (NST)

Upon enrolment into the nursing home or care centre, the nutritional needs of the resident/client should be assessed periodically. The following details should be specifically noted and accommodated for in meal preparation:

- Existing medical conditions that require special dietary requirement.
- Therapeutic diets as prescribed by dietitian.
- Texture and fluid consistency as prescribed by speech therapists.
- Religious, cultural, and ethnic requirements.
- Food allergies.
- Personal preferences and feeding assistance.
- Oral intake monitoring.
- Monthly weight monitoring.





This section guides service providers on including additional sources of nutrients that are often challenging to consume adequately. Adding ingredients to existing recipes (e.g. skim milk powder and cream to blended vegetable soups) to boost energy and protein content requires recipe testing and the development of a standard recipe to ensure suitable texture, flavour, and enhanced nutrition.

Enrich meals with additional protein and energy

The protein content of a recipe can be enhanced by adding or increasing the following ingredients:

- Chicken, mutton, fish and seafood
- Lentils and legumes
- Soy products and tofu
- Dairy foods such as milk, cheese and yoghurt
- Eggs (e.g., adding egg to soup or vegetables)
- Incorporate milk into recipe items to increase protein (and energy) content.

  Examples of recipes to which milk powder can be added to:
  - » Creamy soups
  - » Mashed potato
  - » Custard and pudding
  - » Desserts like red bean soup, pulut hitam, bubur cha cha
  - » Oat and beverages like coffee, tea and malted drinks

Additional energy can also be added to suitable recipes by incorporating energy-dense ingredients such as:

- Healthier cooking oil
- Trans-fat-free margarine
- Soy milk
- Avocado
- Nuts and seeds



Enrich meals with additional calcium

Ways to increase the calcium content of recipes include:

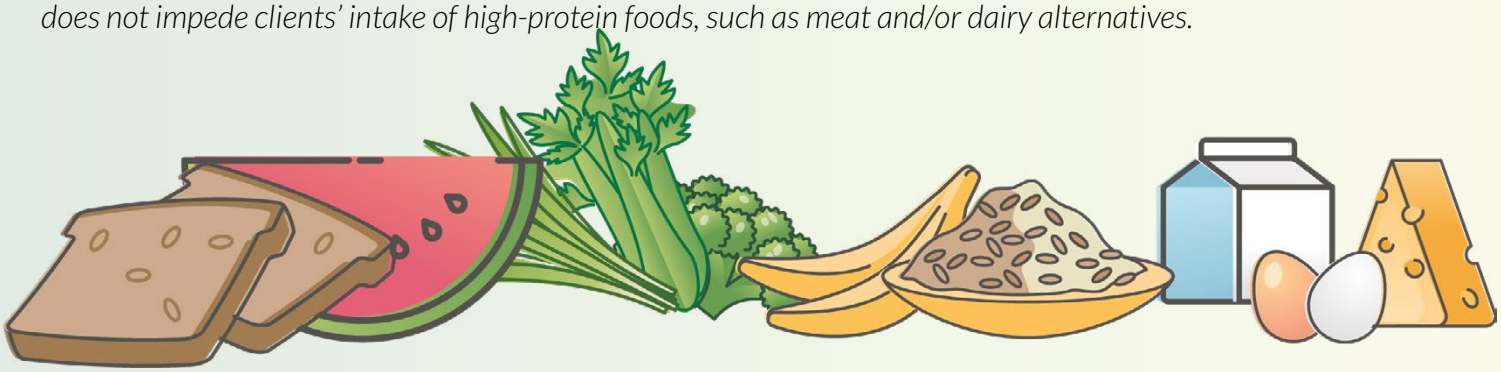
- Adding low-sodium and low-fat cheese into dishes such as pasta, cheese naan and cheese pancake.
- Use high-calcium soymilk or firm tofu.
- Adding milk or soymilk to cream soups whenever possible.
- Include yoghurt, cheese, or milk in dessert preparation.

Enrich meals with additional fibre

Ways to increase fibre content of recipes include:

- Adding extra fruits and vegetables to both cooked dishes and salads.
- Incorporating fresh fruit or dried fruit into dishes.
- Adding vegetables, legumes and lentils to soups and stew.
- Including vegetables, legumes and oat bran to patties, rissoles, meatloaf and minced-style dishes.
- Choosing wholemeal and wholegrain breads and cereals.

Note: It is recommended to introduce any increase in fibre gradually. Sufficient fluids are also necessary to prevent constipation. Fibre may contribute to a sense of satiety, so it is crucial to ensure that the added fibre does not impede clients' intake of high-protein foods, such as meat and/or dairy alternatives.



Supporting adequate intake for clients with loss of appetite

Some clients may request smaller meal portions because they are unable to finish their meals due to reduced appetite or reluctant to eat. While smaller meal portions may encourage consumption among these clients, they may not provide sufficient nutrients as outlined in My Healthy Plate or the recommended dietary allowance. The tendency to request smaller portions is a red flag for malnutrition risk, highlighting the need for referral to a doctor and dietitian for nutrition assessment.

Food fortification

Meals and snacks can be enriched (with additional energy and protein) without increasing their volume. This is particularly important for individuals with a reduced appetite as they often feel full before they have consumed enough to meet their nutrition requirements.

- Add eggs to recipes such as rice or porridge, soups, or vegetables.
- Use full cream milk or soymilk for the following items:
  - » Creamy soups.
  - » Mashed potato.
  - » Desserts like red bean soup, pulut hitam, bubur cha cha.
  - » Add healthier cooking or sesame oil into rice or porridge.
  - » Marinate chicken, meat or tofu with healthier cooking oil, trans-fat free margarine or honey.

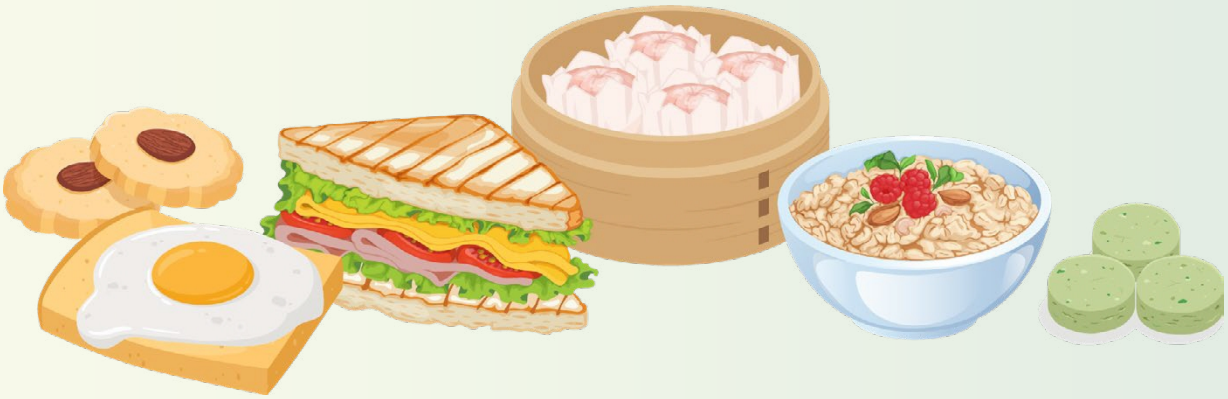
Refer to Appendix F for food fortification ideas.

Nourishing snacks

To support adequate dietary intake, additional meals or snacks should be provided for those who are at risk of malnutrition or who are already malnourished.

- Biscuits
- Baked beans on toast
- Chicken pau
- Boiled eggs and toast
- Scrambled eggs on toast
- Chicken, tuna, egg or cheese sandwich
- Desserts like red bean soup, peanut paste, sesame paste, pulut hitam
- Peanut toast
- Siew mai, har gow
- Kueh-kueh like curry puff, kueh lapis, roti jala, vadai.

Refer to Appendix G for snack ideas and Appendix H for high-energy, high-protein meal ideas.

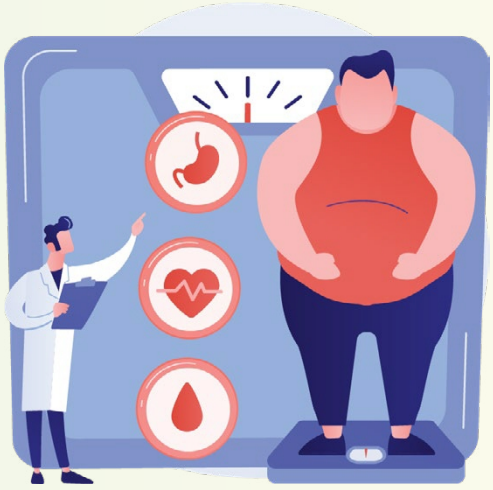


NUTRITIONAL-RELATED DISORDERS
AND ITS DIETARY GUIDELINES

Nutritional-related disorders are health conditions that arise due to imbalances in the diet. They can significantly impact an individual's overall health and quality of life. Proper dietary guidelines are crucial for the prevention, management, and treatment of these conditions.

Obesity

- Follow the portion recommended by My Healthy Plate.
- Reduce portion sizes.
- Reduce excess carbohydrate, protein and fat.
  - » Choose wholegrains like brown rice, wholemeal bread, oat.
  - » Limit refined carbohydrates, e.g., desserts, sugar-sweetened beverages.
  - » Encourage moderate intake of lean protein such as lean meat and fish.
- Increase fibre.
  - » Increase vegetables and fruit intake to achieve 2 serves each.
- Serve food prepared using healthy cooking methods
  - » Serve boiled, steamed, poached, braised, stir-fried, grilled, baked food.
  - » Limit deep-fried foods to maximum 2 times a week.
  - » Remove skin and fats before cooking.
  - » Avoid or limit gravies.



Diabetes

- Choose carbohydrates wisely.
  - » Consistent and appropriate portions.
  - » Two servings of non-starchy vegetables per day .
  - » Two servings of fresh fruits daily - each serving at separate timing, include 1 serving as part of a meal or mid-meal snack.

- Include wholegrains.
- Avoid added sugars from sugar-sweetened beverages and desserts.
- Consistent timing.
  - » Serve meals at about the same time each day.
  - » If allowed snacks, limit consumption of carbohydrate-containing food or beverage to ½ serve in between meals.
- Maintain healthy body weight, and reduce overall calorie intake if overweight or obese.
- Choose low-fat meals.
  - » Avoid gravies, fatty meat and poultry skin.
  - » Limit deep-fried foods to maximum 2 times a week.
  - » Choose low-fat dairy products.
  - » Use healthier fat and oil while limiting the amount consumed.



Dementia

- Provide food and drinks in a functional dining room with an atmosphere that stimulates eating and drinking to support adequate dietary intake.
- Present attractive food choices, snacks, and beverages to stimulate appetite.
- Assess individual habits, preferences, abilities, and behaviours around eating and drinking.
- Refrain from placing undue dietary restrictions that could limit food and fluid intake, except when advised by a doctor or dietitian.
- Review medication to minimise adverse effects on fluid and fluid intake.
- Provide support for individuals with dementia, especially those who struggle with eating and drinking independently.
- Provide appropriate eating and/or drinking utensils to support independence.
- Offer additional drinks, snacks and finger foods to facilitate food and fluid intake.
- Consider texture-modified diet, fortified foods, and drinks as a compensatory strategy to achieve adequate food and fluid intake.

NUTRITION AND FOOD SERVICE AUDIT

The purpose of an audit is to ensure the safety and quality of food served to clients. Regular audits demonstrate a commitment to client care and well-being. It is important to note that an audit score lower than the standard does not indicate non-compliance with the regulations. Rather, it signals the need for improvement to achieve optimal standards. Maintaining an audit file allows you to monitor trends over time. If audit scores consistently meet the acceptable level, you can be confident that your care standards are being met.

Service providers should:

- designate staff members or an external party to complete the audit, especially if in-house staff are not qualified to perform the audit.
- schedule audits throughout the year.
- document audits outcomes.

Recommended audits

Recommended audits	Purpose	Responsible staff
Menu review	Menu audit compares the cycle menu, including texture-modified diet and therapeutic diet, with the recommended dietary allowance.	Dietitian
Meal service audit	Audit the meals served including the appropriateness of items, portion size, correspondence with the standard and quality.	Dietitian, trained/ assigned centre staff/ care staff
Dining environment audit (optional)	Audit the dining environment in the facility including feeding assistance provided for those needed.	Dietitian or food service supervisor
Food service satisfaction survey	Audit clients' satisfaction with the meals provided.	Food service staff, volunteer, family member

Frequency of nutrition and food service audits

Regular nutrition and food service audits must be conducted to ensure compliance with standards. If the audit outcomes are deemed unacceptable, corrective actions must be implemented promptly. These audits should be repeated as necessary, with increased frequency until acceptable outcomes are consistently achieved.

Refer to Appendix I for samples of food service audit and audit forms (adapted from Audits & More: A Nutrition and Food Service Audit Manual for Adults Residential Care Facilities with 25 or more Persons in Care)



ROLE OF DIETITIANS

Dietitians play a vital role in maintaining high standards of patient-centred nutrition and food service in care facilities. They collaborate closely with care providers to plan and serve high-quality, nutritionally balanced meals to residents and clients. Dietitians possess the skills and knowledge to provide consultation to care facilities, ensuring that residents' and clients' nutritional needs are met through the provision of safe, nutritionally adequate food and beverages. Their involvement contributes to improved nutrition care and health outcomes. It is recommended for care facilities to consult a dietitian in the following key areas:

Menu planning and development

- Review and ensure the menu is varied, well-balanced to meet nutritional requirements, considering individual preferences, allergies and dietary needs.

Menu and food service audit

- Review plated meals to ensure they align with dietary guidelines.
- Evaluate meal presentation, taste, and food portion.
- Conduct audit to assess food quality, safety, and adherence to standards.
- Inspect kitchen facilities and food storage areas for cleanliness and compliance to food safety standards.

Management of malnutrition

- Provide timely nutrition assessment and intervention to address clients/residents with risk of malnutrition or other nutrition-related issues.



Training and education

- Provide training for nursing and food service staff.
- Educate staff on nutrition, safe food handling, and therapeutic diets.

FURTHER INFORMATION

Useful links and resources:

1. Recommended Dietary Allowances. https://www.healthhub.sg/live-healthy/recommended_dietary_allowances

2. Recommended protein intake. https://www.healthhub.sg/live-healthy/seniors-need-more-protein

3. Recommended fibre intake. https://www.healthhub.sg/live-healthy/more-fibre-for-a-fit-and-fabulous-you

4. EatSafe SG. https://www.moh.gov.sg/hpp/allied-health-professionals/eatsafe-sg

5. Food Handler's Handbook. https://www.nea.gov.sg/docs/default-source/resource/food-handler's-handbook-(english).pdf

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7. Community Nutrition and Dietetics Workgroup Resources

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APPENDICES

Appendix A:

Food Sources of Iron, Folic Acid, Vitamin B12, Calcium, and Vitamin D

Iron is important for producing red blood cells and transporting oxygen in our bodies. There are two types of iron in food.

Haem iron:	Non-haem iron:
Found mainly in animal sources	**Normally found in plant sources and iron-fortified food**
Sources: • Lean beef, lamb, pork • Duck/chicken without skin • Fish • Egg • Liver (beef, chicken, pork) - limit intake if you have high cholesterol	**Sources:** • Dark green leafy vegetables e.g., spinach, • Legumes (beans, lentils, peas), nuts, seeds • Tofu • Dried fruits • Iron-fortified foods • Wholegrains for e.g. brown rice, wholemeal bread

Aim 8mg/day for those who are 60 years and above.

Dietary sources of iron:

Haem iron food	Amount	Iron (mg)	Haem iron food	Amount	Iron (mg)
***Pork liver**	90g	16.2	***Shrimp**	90g	2.5
***Chicken liver**	90g	7.6	**Turkey**	90g	1.8
***Oysters**	90g	7.4	**Pork**	90g	1.0
***Mussels**	90g	6.4	**Egg**	1 medium	1.0
***Beef liver**	90g	6.1	**Chicken breast**	90g	0.8
Beef	90g	2.7	**Fish**	90g	0.5
***Clams**	90g	2.6			

*Items that should only be consumed occasionally as they are high in cholesterol

Non-haem iron food	Amount	Iron (mg)	Non-haem iron food	Amount	Iron (mg)
Yellow lentils, boiled	120g	5.2	**Green leafy veg, boiled**	100g	2.0
Wholemeal bread	2 slices	4.3	**Almonds**	30g	1.3
Kidney beans	½ cup	4.3	**Kang Kong**	100g	1.3
Tofu	170g	3.2	**Green peas, cooked**	½ cup	1.0
Prune juice	1 cup	2.8	**Broccoli**	100g	0.8
Baked potato	1 whole	2.8	**Prunes, dried**	5	0.5
Black beans, boiled	120g	2.5	**Brown rice**	1 bowl	0.5
Pumpkin seeds	2 tbsp	2.4	**Oatmeal, cooked**	1 cup	0.4
Cashew	30g	2.3			

Folate / folic acid

Folate deficiency can affect brain function, making it a possible risk factor for dementia. Folate is naturally present in a wide variety of foods, including:

- Vegetables (especially dark green leafy vegetables like spinach)
- Fruits
- Nuts
- Beans and peas
- Seafood
- Eggs
- Low-fat dairy products
- Lean meat
- Poultry without skin
- Grains

Aim 400mg/day for those who are 60 years and above.

Dietary sources of folate:

Food	Amount	Folate (mcg)	Food	Amount	Folate (mcg)
Cooked cabbage	1 cup	205.1	**Lettuce**	1 cup	127
Cooked broccoli	1 cup	173.1	**Papaya**	1 cup	111.5
Cooked Chinese spinach	1 cup	154.3	**Orange juice**	1 cup	102
Cooked beetroot	1 cup	153.9	**Strawberries**	17 pieces	95.2
Spring onions	6 pieces	143.1	**Oranges**	2 pieces	91.3
Black beans	1 cup	140	**Cooked cereal (rolled oats)**	1 cup	85.7
Cooked cauliflower	1 cup	131	**Kiwi (peeled, golden)**	1 ½ pieces	45.6

Vitamin B12

Vitamin B12 is important for brain health and making healthy red blood cells. It is only available in animal sources. Sources of vitamin B12:

- Lean beef, lamb, pork
- Chicken or duck without skin
- Fish and seafood
- Eggs
- Low-fat milk, cheese, yoghurt
- Vitamin B12-fortified cereals or nutritional yeast

Aim 2.4 mcg/day for those who are 60 years and above

Dietary sources of Vitamin B12:

Food	Amount	Vitamin B12 (mcg)
Nutritional yeast	2 tablespoons	2.4 to 8
Beef mince, lean, stir fried	90g	3.2
Fat-free milk	1 cup	2.1
Salmon	90g	1.9
Canned tuna in water, drained	90g	1.4
Chicken egg	2 eggs	1.2
Lamb chop, roasted	90g	1.2
Roast turkey, skinless	90g	0.9
Low-fat cottage cheese	120g	0.7
Low-fat yoghurt	1 cup	0.5
Pork cutlet, grilled	90g	0.4
Cheddar cheese	1 slice	0.4
Ham, lean	1 slice	0.2
Chicken breast, skinless, steamed	90g	0.2

Calcium

Calcium is the building block of bone. Sources of calcium:

- Milk and dairy products
- Firm tofu, tempeh
- Dark green leafy vegetables such as kai lan, spinach, chye sim, broccoli
- Anchovies & sardines (with bones)
- Almonds, black sesame seed, chia seed

Aim 1000mg of calcium a day

For those who do not drink milk or are lactose intolerance, choose:

- High-calcium soy milk, almond milk, rice milk
- Cheese & yoghurt (lactose content is lesser)

Dietary sources of calcium:

Food	Serving size	Calcium content (mg)
Dairy products		
High-calcium milk powder	4 scoops (25g)	500
Low-fat milk	1 glass (250ml)	380
Full cream milk	1 glass (250ml)	300
Low-fat yoghurt	1 caron (150g)	240
Low-fat cheese*	1 slice (20g)	200
Non-dairy products		
Canned sardine (with bones)	1 fish (80g)	270
Dried ikan bilis (with bones)	2 tablespoons (40g)	270
Silken tofu	package (150g)	100
Tau kwa	1 small cake (90g)	150
Dhal (raw)	1 mug (50g)	85
Baked beans, canned*	can (210g)	110
Kai lan, cooked	1 mug (100g)	195
Spinach, cooked	1 mug (100g)	140
Chye sim, cooked	1 mug (100g)	140
Broccoli, cooked	1 mug (100g)	50
Calcium-fortified products		
High-calcium soybean milk	1 glass (250g)	450
Enriched bread	2 slices (60g)	100
Calcium-fortified orange juice	1 serving (240ml)	350

*Item may be high in salt

Vitamin D

Vitamin D increases the absorption of calcium and strengthens our bones. Sources of vitamin D:

- Sunlight
- Egg yolk
- Sardine, tuna, salmon
- Liver
- Cod liver oil
- Vitamin D-fortified margarine and milk

Appendix B:

Carbohydrate, Protein, Fruit List and Their Serving Size

1. Carbohydrate-rich food list and its serving size

(i) Wholegrains

Brown rice and wholemeal (carbohydrate)	1 serving
Brown rice	½ bowl (100g)
Brown rice bee hoon	½ bowl (100g)
Brown rice noodle	½ bowl (100g)
Whole wheat pasta	½ bowl (100g)
Chapati	2 pieces (60g)
Wholemeal bread	2 pieces (60g)
Oat (uncooked)	2/3 bowl (50g)
Corn kernels	8 dessertspoon (150g)
Corn on the cob	1 whole (300g)
Wholemeal cracker	4 pieces (40g)

(ii) Root vegetables

Root vegetables	1 serving
Potato	2 egg size (140g)
Sweet potato/yam	2 pieces (120g)

(iii) Refined carbohydrate

Refined carbohydrate food	1 serving
White rice	1/2 bowl (100g)
Rice porridge	1 bowl (260g)
Noodle, raw	2/3 bowl (130g)
Bee hoon	35g raw or ½ bowl (100g cooked)
Pasta	½ bowl (100g)
Kway teow, cooked	½ bowl (100g)
Plain dosa	2 pieces (90g)
Idli	2 pieces (150g)

(iii) Refined carbohydrate (continued)

Refined carbohydrate food	1 serving
Chwee kueh (Served with preserved radish and chilli)	3 pieces (170g)
Chee chong fun, plain, with sauce	120g
Deep fried carrot cake	1 piece (130g)
Chicken pau	120g
Red bean bun	1 piece (70g)
Coconut bun	1 piece (70g)
Kueh dadar	1 piece (80g)
Kueh salat	3 pieces 162g)
Kueh talam	1 piece (100g)
Cream cracker	6 pieces (54g)
Marie biscuits	6 pieces (42g)

2. Protein-rich food list and its serving size (1 serving provides at least 20g of protein)

Protein-rich food	1 serving
Fish, chicken, meat (boneless & skinless, cooked)	1 palm size (90g)
Prawn (no shell, medium size)	5 pieces (90g)
Egg	3 eggs (150g)
Milk or high-calcium soy milk*	2 glasses (500ml)
Yogurt*	2 small tubs (300g)
Cheese*	5 slices (105g)
Silken tofu	1 box (300g)
Taukwa*	1 ½ piece (180g)
Tempeh, raw	4 pieces (120g)
Beans, cooked (soy bean, red bean, green bean, lentils, chickpea, black bean, black eye pea, etc)	¾ -1 mug (120-200g)
Egg tofu	2 pieces (300g)
Dried beancurd sheet	1 piece (40g)
Soy chip	3 pieces (150g)
Nuts	1 cup (150g)

**Dairy foods or calcium-rich foods*

It is important to incorporate a variety of protein food sources in daily diet.

3. Fruit list and its serving size

Fruit	1 serving
Apple	1 small (135g)
Apricots, fresh	3 medium (135g)
Apricots, dried	3 whole (30g)
Banana	1 small (9-10cm)
Dates	2 pieces (20g)
Dragonfruit	2/3 (200g)
Mango	½ (80g)
Orange	1 medium (140g)
Papaya	1 slice (150g)
Pear	1 small (100g)
Pomelo	1 ½ section (150g)
Pineapple	1 slice (150g)
Watermelon	1 slice (220g)

Reference:

https://www.nuh.com.sg/care-at-nuh/specialties/medicine/endocrinology/flexible-mealtime-insulin-dosing-and-carbohydrate-counting

https://www.ktph.com.sg/healthlibrary/Documents/Nutr%20Posters/KTPH_%5BColour%5D%20Carbohydrate%20Exchanges%20List%20%28E%29.pdf

https://focos.hpb.gov.sg/eservices/ENCF/foodsearch.aspx

Appendix C:

Menu Checklist

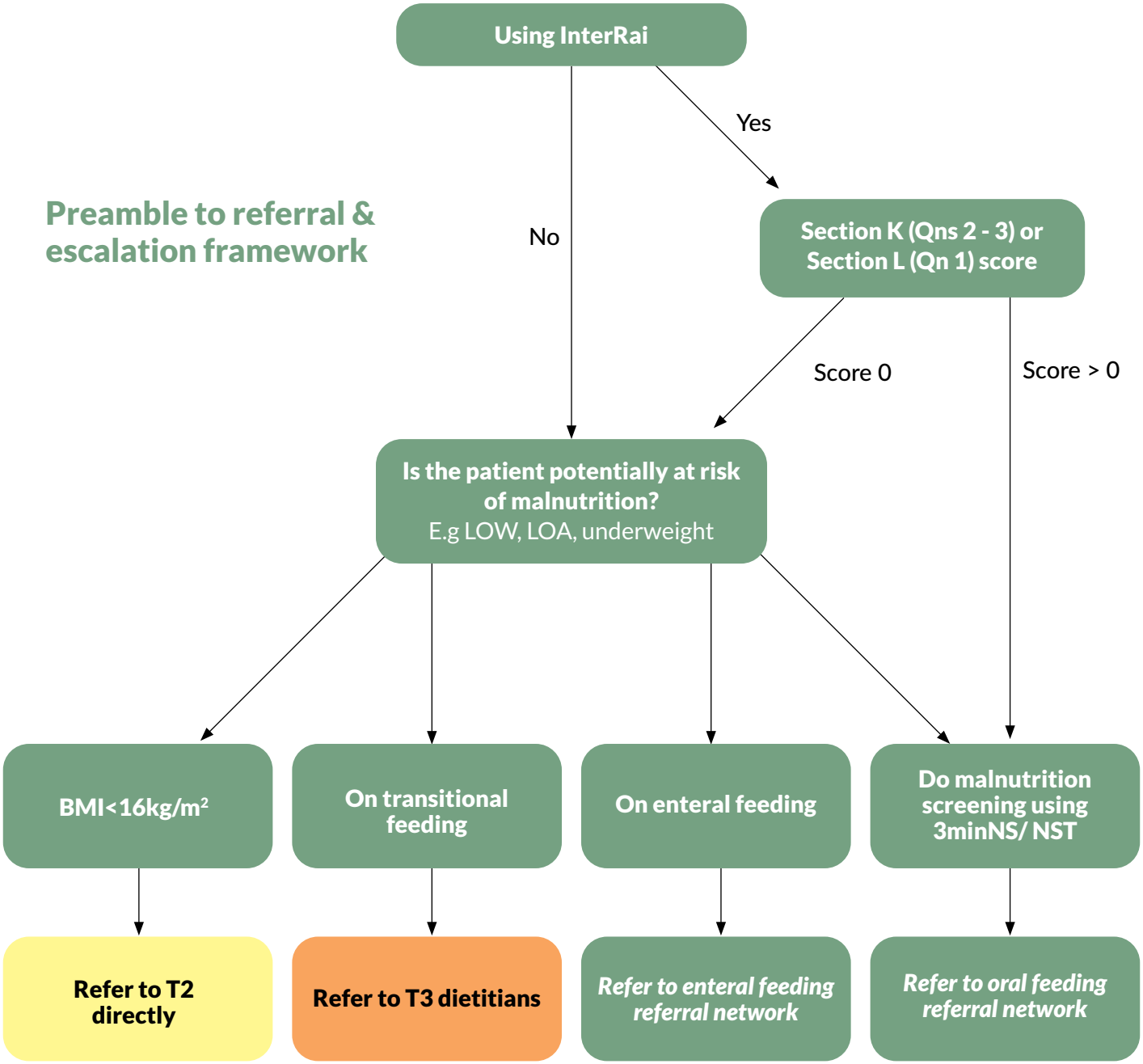
Criteria	Yes	No	N/A	Comments
General menu requirements				
Clients are served 3 meals and 2 snacks a day*				
Dishes are not repeated within the day				
Menu meets daily recommended requirement*				
Brown rice and wholemeal bread: 4-6 servings				
Meat and others: 2 servings				
Fruit: 2 servings				
Vegetables: 2 servings				
Dairy food or calcium-rich foods: 1 serving				
Meals meet minimum portion sizes				
Breakfast				
Brown rice and wholemeal bread: 1 serving				
Dairy foods or calcium-rich food: ½ serving				
Lunch				
Brown rice and wholemeal bread: 2 servings				
Meat and others: 1 serving				
Fruit: 1 serving				
Vegetables: 1 serving				
Afternoon tea				
Brown rice and wholemeal bread: ½ serving				
Dinner				
Brown rice and wholemeal bread: 2 servings				
Meat and others: 1 serving				
Fruit: 1 serving				
Vegetables: 1 serving				
Supper				
Brown rice and wholemeal bread: ½ serving				
Dairy foods or calcium-rich food: ½ serving				
Healthier meals				
Serve wholegrains when possible				
Serve fish that is a good source of omega-3 fatty acid when possible				
Serve meat and fish without bone				
Serve calcium-rich or calcium-fortified foods on a daily basis				
Serve lean cuts of meat				
Use cooking oils that contain lower levels of saturated fat and trans fat				
Season dishes with fresh ingredients instead of salt and sauces				
Use healthier cooking methods				
Additional Components				
Serve food of different colours to increase appeal				
Identify food allergy				
Identify the nutritional needs of clients (therapeutic diet, texture-modified diet)				
Identify client's religious, cultural, and ethnic requirements				
Identify client's food preference				
Water is made available at all times				
Serve food at appropriate temperature				

**only applicable for nursing homes*

Appendix D:

EatWise Referral Framework

Preamble to referral & escalation framework



Referral Framework – Oral Feeding

Refer to appropriate tier based on clinical judgement. Consider other factors e.g. goals of care

	3minNS or NST score0-1	3minNS or NST score 2	3minNS or NST score ≥3
Stable medical conditions	**Tier 1**	**Tier 2**	**Tier 3**
^Recent acute medical conditions	**Tier 2**	**Tier 2**	**Tier 4**

^Recent acute medical conditions: conditions that will increase nutritional requirements E.g. cancer, post transplant, pre/post major operation, severe pressure injuries (non-exhaustive list, based on clinical judgement)

All providers should encourage patients to seek medical attention if their condition deteriorates

Guiding principles	Rescreening
Tier 1 **What:** Basic nutrition advice and intervention. provide self-empowerment resources **Who:** Lay-extenders, or direct to self-help resources **How:** Preventive group sessions / activities	**Yearly** **+** **When changes in health conditions**
Tier 2 **What:** Enhanced nutrition advice, intervention and support (e.g. nutrition counselling), provide self-empowerment resources **Who:** Non-dietitian healthcare providers, trained nurses, and support from Tier 1 if needed **How:** 1-1 consult, telehealth, centre-based e.g. SSAs and CCOs	**3-6 monthly** **+** **When changes in health conditions** **3 monthly if patient decline Dietitian support**
Tier 3 **What:** Personalized nutrition assessment and intervention **Who:** Primary care or community dietitians, co-managed with specialist dietitians and support from Tier 4 if needed **How:** 1-1 consult, telehealth, centre-based e.g. SSAs, CCOs or structured education programs by dietitians	**Not needed Tier 1 and 2 to monitor closely and re=escalate as necessary**
Tier 4 **What:** Specialized nutrition assessment and intervention **Who:** Acute hospital / specialist dietitians in team-based management @ SOC with support by Tier 3 if needed **How:** 1-1 consult / telehealth, structured education programs by dietitian and multi-disciplinary team	**Not needed Tier 1 and 2 to monitor closely and re=escalate as necessary**

Abbreviations:
3minNS: 3-minute Nutrition Screening
BMI: Body mass index
CCO: Community Care Organization
LOA: Loss of appetite
LOW: Loss of weight
NST: Nutrition Screening Tool
SOC: Specialist Outpatient Clinic
SSA: Social Service Agency

Escalation Criteria (Oral and Enteral Feeding)

1. Below table is meant to complement the referral criteria. It outlines the types of patients that might fall within each tier.
2. Consider goals of care when tiering (Note: the presence/ absence of frailty will not be considered in the escalation criteria as the underlying assessment is based on nutritional status)

*non exhaustive list

Consider escalating if (i) clinical deterioration (ii) Require more individualized dietary intervention → **Consider escalating if unable to meet individualized treatment targets after 1-2 months intervention** → **Consider escalating if unable to meet individualized treatment targets after 3-4 months intervention**

	Tier 1	Tier 2	Tier 3	Tier 3
Guiding principle (Over-arching description of the types of patients which fit into each tier)	• Stable and well • No/very low malnutrition risk	• Low risk of malnutrition • Underweight • At risk for feeding complications w/o indication for reassessment of nutritional requirements	• Risk of malnutrition w/o subacute medical conditions • Require reassessment of nutritional requirements • Require titration of feeds • Patients in the community	• Risk of malnutrition with complex medical conditions • Require highly individualized and intensive treatment/team-based care at SOC • Acute admission
Oral feeding* (Examples of situations where care should be escalated to the next/ appropriate tier)	• 3minNS or NST score 0-1 • Dentures with no swallowing difficulties • Regular diet • Beginning risk of pressure injury	• BMI <16kg/m^2 • 3minNS or NST score 2 • Osteopenia (BMD T-score <-1 to >-2.5 • Texture modified diet • Require prescription/ modification of basic ONS using standard protocol • Vegetarian / restrictive diet patterns • Stage 2 pressure injury	• 3minNS or NST score ≥3 • Increased metabolic requirements e.g. cancer, post-op • Osteoporosis (BMD T-score ≤-2.5) • Multiple falls • Require prescription/modification of specialized ONS (e.g. renal formula) • Did not improve with standard ONS protocol after 1-3 months • Full liquid diet • Intolerances to ONS regime • Stage ≥3 pressure injury / poor healing wounds	• 3minNS or NST score ≥3 • Cachexia • Post transplant • Post-op with complications • Cancer + chemo/radio/therapy/ immunocompromised • Multiple falls leading to admission / surgery needed • Severe pressure injury requiring acute care/surgery • Eating disorders
Enteral feeding* (Examples of situations where care should be escalated to the next/ appropriate tier)	• NA – all enteral feeding to be handled minimally by tier 2	• No elevated metabolic requirements • No indication for titration of feeds	• Newly initiated tube feeding • Newly diagnosed medical conditions e.g. DM, CKD • Newly imposed fluid restriction • Elevated metabolic requirements/weight changes that require recalculation of feeds • Transitional feeding	• High metabolic requirements e.g. cancer treatment, burns, fractures, wounds (see above wounds related) • Complex transitional feeding / needing combined effort with ST

To consider de-escalating when stable

Abbreviations:
3minNS: 3-minute Nutrition Screening
BMD: Bone mineral density
BMI: body mass index
BP: blood pressure
CKD: chronic kidney disease
DM: diabetes mellitus
NST: nutrition screening tool
ONS: oral nutritional supplements
SOC: specialist outpatient clinic
ST: speech therapist

Appendix E:

Nutrition Screening Tools

a) 3-Minute Nutrition Screening

3-minute nutrition screening (3-MinNS)				
	Nutrition indicators			
	Unintentional weight loss (past 6 months)	Oral intake (past 1 week)	Muscle wastage	
3	> 7kg	Starvation or < ¼ share of usual portion per meal Tube feeding < 1 L/day (1kcal/ml feed) <1000kcal/day	Hollowing, Depression of temple muscle	Protruding & prominent clavicle bone
2	> 3kg to 7kg Yes, unsure	¼ - <½ shafe of usual portion per meal Tube feeding 1 -1.25 L/day (1 kcal/ml feed) 1000 - 1250 kcal/day	Slight depression of temple muscle	Slight protrusion of clavicle bone
1	1 to 3kg Don't know	½ - ¾ share of usual portion per meal ¼ - <½ share of usual portion per meal with oral support Tube feeding >1.25 - 1.5 L/day (1 kcal/ml feed) >1250 - 1500 kcal/day		
0	No change/Weight gain/intentional weight loss < 1kg	Normal intake with ¾ - 1 share of usual portion per meal Tube feeding > 1.5 L/day (1 kcal/ml feed) > 1500 kcal/day	Well defined muscle	No protruding clavicle bone
Scoring (circle one per column)	**3 2 1 0**	**3 2 1 0**	**3 2 1 0**	
Total score		**Referral to Dietitian if total score is 3 or more**		

(b) Nutrition Screening Tool

Indicators	Scoring	
Physical appearance	**Normal** At least normal muscle bulk and fat stores Rounded shoulders Large space between fingers	**0**
	Moderately underweight Mild/moderate loss of fat from triceps and shoulder region Slight depression of temples, moderate facial muscle wasting Bones may show slightly	**1**
	Severely underweight Severe loss of fat from triceps and shoulder region Hollowing depression of temples, facial muscle wasting Protruding, prominent bones	**2**
Diet intake adequacy over past 5 days or more Suggestion on how to question: 1. Have you been eating poorly/ less before admission? 2. If "yes", for how long? Only considered if >5 days;if all along eating lesser for 6 months or longer, this will be considered as usual intake and a score of 0. 3.If "Yes", how much lesser are you eating compared to your usual? is it ¾ ,½ or ¼ of your usual intake?	**Normal** No change Consistently takes a complete nutritional supplement (e.g. Ensure, Glucerna) to supplement diet	**0**
	Reduced moderately Takes ½ to ¾ of normal/usual intake Inconsistently takes a nutritional supplement to supplement reduced intake 1000-1200ml of a 1kcal/ml formula (e.g. Ensure, Jevity, Glucerna) per day via feeding tube or orally	**1**
	Reduce severely Takes less than ½ of normal/actual intake or has been NBM Does not take a nutritional supplement <1000ml of a 1kcal/ml formula (e.g. Ensure, Jevity, Glucerna) per day via feeding tube or orally	**2**
	Not available	**-**
Unintentional weight loss over past 6 months Suggestion on how to question: 1.Have you lost any weight in past 6 months? 2. If "yes", how many kilograms have you lost? not able to accurately quantify, this will be considered as "Yes, unsure". 3. If this weight loss intentional/on purpose? If "Yes", this will be considered as "No"	**No**	**0**
	Unsure	**1**
	Yes, 0.5 - 3.0kg	**2**
	Yes, >3.0 - 7.0kg	**3**
	Yes, >7.0kg	**4**
	Yes, Unsure	**2**
	***Total score**	

Appendix F:

Food Fortification Ideas

Food fortification increases the nutritional content of food without increasing its total volume. It is recommended for small eaters and individuals on texture texture-modified diet to enrich their diet. These food can be added into diet to increase its calorie and/or protein content:

Carbohydrate	 Maple syrup/ Honey
Protein	   Soy bean product, lentils, milk & milk products, meat, nuts, fish, eggs, poultry  Full-cream dairy products
Fat	 Butter/ margarine /oil  Avocado

(a) ideas on fortifying rice, porridge or noodles

1 Base food item

Carbohydrates



Porridge



Rice



Noodles

+

2 Add 1 or more toppings

Protein



Eggs



Fish



Braised peanuts

Carbohydrates



You tiao



Sweet potato

Fats

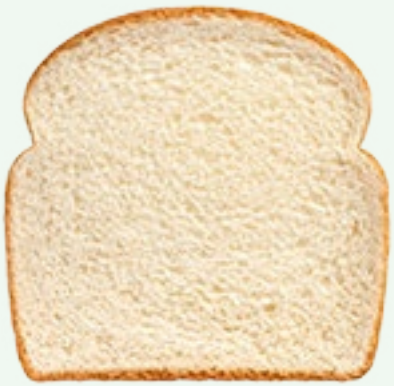


Cooking oil / Sesame oil

(b) ideas on fortifying bread

1 Base food item

Carbohydrates



Bread

+

2 Add 1 or more toppings

Protein



Peanut butter



Cheese



Tuna in oil

Carbohydrates



Fruit jam



Kaya

Fats



Butter / Margarine



Mayonnaise

(c) ideas on fortifying drinks

1 Base food item

Fluid



+

2 Add 1 or more toppings

Protein



Soya bean milk



Full-cream milk



Milk powder

Carbohydrates



Condensed milk



Honey

Appendix G:

Examples of Finger Food

1. Examples of high-energy, high-protein snacks for regular diet (IDDS Level 7)



Siew Mai



Egg Mayo Sandwich



Biscuits (jam)



Chickpeas



Chicken Pau



Chng Teng



Scramble Eggs



Almond Jelly



Egg Tart



Sweet/savoury Buns



Kueh



Pisang Goreng

2. Examples of high-energy, high-protein snacks for texture-modified diet – IDDSI level 6: soft and bite-sized



Almond Jelly



Beancurd (remove syrup



Peanut Soup



Sponge Cake



Omelette



Steamed Egg

The above foods are suitable for a soft and bite-sized diet, however individuals should perform the relevant check for all type of food as the resultant consistency is likely to be dependent on the preparation process and ingredients selected. If the food item is too watery, thickener will need to be added; if it is too firm or sticky, will need to water down as appropriate. To exclude the food if it cannot be modified adequately.

3. Examples of high-energy snacks for texture-modified diet – IDDSI level 5: minced and moist diet



Scramble Eggs (mashed)



Otah (mashed)



Shepherd/Cottage Pie (mashed)



Kueh Talam (mashed)



Yam Cake (mashed)

The above foods are suitable for a minced and moist diet, however individuals should perform the relevant check for all type of food as the resultant consistency is likely to be dependent on the preparation process and ingredients selected. If the food item is too watery, thickener will need to be added; if it is too firm or sticky, will need to water down as appropriate. To exclude the food if it cannot be modified adequately.

4. Examples of high-energy snacks for texture-modified diet – IDDSI level 4: pureed diet



Almond Paste



Sweet Potato Puree



Yam Paste (Orh Nee)



Avocado Puree



Black Sesame Paste



Cream Chicken Soup



Chocolate Mousse



Chocolate Pudding



Custard



Full Cream Yoghurt



Peanut Paste



Walnut Paste

The above foods are suitable for pureed diet, however, individuals should perform the relevant check for all types of food as the resultant consistency is likely to be dependent on the preparation process and ingredients selected. If the food item is too watery, thickener will need to be added; if it is too firm or sticky, will need to water down as appropriate. To exclude the food if it cannot be modified adequately.

Appendix H:

High-energy, high-protein meal ideas

Food group distribution in a day:

	Brown rice & wholemeal bread	Meat and others	Vegetables	Fruit	Dairy foods or calcium-rich food
Breakfast	1	-	-	-	½
Lunch	2	1	1	1	-
Afternoon tea	½	-	-	-	-
Dinner	2	1	1	1	-
Supper	½	-	-	-	½

This is based on a daily requirement of 1800kcal a day.

Example of a high-energy, high-protein meal plan in a day:

Meals	Brown rice & wholemeal bread	Meat and others	Vegetables	Fruit	Dairy foods or calcium-rich food	Remarks
Breakfast 	1 bowl of oat	-	-	-	1 glass of milk 	Add 1 egg into oat to increase energy and protein content
Lunch (fish slice noodle soup) 	1 bowl of noodle	100g of fish slices	100g of cooked chye sim	1 slice watermelon 	-	Add 1 spoon of healthier cooking oil into fish slice noodle soup to increase energy content of the dish
Afternoon tea 	1 piece chicken pau	-	-	-	-	chicken pau is a high protein snack
Dinner 	1 bowl of Rice	1 palm size of chicken	100g of cooked lady finger	1 small banana 	-	Add curry gravy into rice to increase energy content
Supper 	1 slice of bread with peanut butter	-	-	-	1 glass of milk 	Add peanut butter into bread to increase energy and protein content.

This is based on a daily requirement of 1800kcal a day.

Appendix I:

Sample of Audits and Audit Forms

(a) Sample summary of food service audits

Facility:						Year:		
Name of audit	Staff responsible	Staff assigned	Frequency per year	Date scheduled	Date completed	Audit score	Date of re-audit	Re-audit score
Menu audit	Dietitian	*Name of staff*	When the menu is changed (select general diet plus at least one week of a texture modified diet and one week of a therapeutic diet). Audits should be done at least once a year.					
Meal service audit	Dietitian, trained/ assigned centre staff/ care staff	*Name of staff*	4 times a year - Select therapeutic diet and texture modified foods.					
Dining environment audit (optional)	Dietitian or food service supervisor	*Name of staff*	Once a year					
Food service satisfaction survey	Food service staff, volunteer, family member	*Name of staff*	Once a year					

(b) Sample Menu Audit Form

1. Procedure:

1. Collect the facility cycle menus (e.g., regular, texture-modified, therapeutic).

2. Audit servings for compliance with recommended standards stated at table below. Please refer to institution's standard operating procedure (SOP) or dietitian for therapeutic diets.

The recommended serving size for each food group in a day for standard diet.

	Brown rice & wholemeal bread	Meat and others	Vegetables	Fruit	Dairy foods or calcium-rich food
1200kcal	4	2	2	2	1
1500kcal	5	2	2	2	1
1800kcal	6	2	2	2	1

3. Check 'Standard Met' if the minimum requirements are met.

Part A

Diet Type	Texture	Day	Grains	Meat	Vegetables	Fruit	Dairy	Standard Met
1200kcal	*L7 regular*	*1*	*4*	*2*	*2*	*2*	*1*	✓

Part B: The menus for all diet types have:

		Yes	Exception	No
1.	A menu cycle of at least 2-6 weeks depends on the setting • Centre-based: 2-4 weeks cycle • Nursing home, meals-on-wheels and assisted living facilities: at least 6 weeks cycle			
2.	Standard portion sizes for food and beverages.			
3.	Standard recipes available for all types of food items.			
4.	A rotation for all therapeutic and texture-modified diets that follows the master menu as closely as possible.			
5.	Include food preferences, cultural, ethnic and religious needs of those in care.			
6.	Foods made from various preparation methods as well as an assortment of colours, flavours and textures on a per meal, daily and weekly basis.			
7.	Number of meals and snack served a day • Centre-based: 2 meals and 1 snack • Nursing home, assisted living facility: 3 meals and 2 snacks • Meals-on-wheel: 2 meals			
8.	At least 2 servings of fish each week.			
9.	Whole grain products offered as an option daily.			
10.	At least 2 servings of milk or high-calcium food offered daily.			
11.	At least 2 servings of vegetables and 2 servings of fruit are offered daily.			
	Total (Yes, Exception)			

Part A

$$\textit{Total audit score} = \frac{\textit{Number menu standard met}}{\textit{Total number of menu audited}} \times 100\%$$

Acceptable audit score (100%) ☐ MET ☐ NOT MET

Part B

$$\textit{Total audit score} = \frac{\textit{Total (Yes + Exception)}}{11} \times 100\%$$

Acceptable audit score (100%) ☐ MET ☐ NOT MET

COMMENTS		
Part A:		
Part B:		
CONCERNS IDENTIFIED	**CORRECTIVE ACTION (include date of each action)**	**STAFF RESPONSIBLE**
	Date of next audit	

(c) Meal Service Audit

1. Audit at least 4 therapeutic and/or texture-modified meals throughout the year, including a variety of meals (breakfast, lunch, dinner).

Name of auditor:	Location:	Date of audit:	Menu cycle:	Meal (circle one): Breakfast Lunch Dinner

Are the meal items served according to the menu cycle ☐ Yes ☐ No

Menu item

Menu item selected	Part A					5. Texture (Adhere to IDDSI)	6. Portion	Total
	1. Aroma	2. Temperature	3. Appearance	4. Taste	Total			
	Give the number that best fits your description *1 = totally unacceptable 2 = unacceptable 3= minimally acceptable 4 = acceptable 5 = totally acceptance*				*Yes/No (Yes = all the score are 4 and above)*	*Yes/No*	*Yes/No*	*Yes/No (when part A, #5 & #6 all meet the standard)*
1.								
2.								
3.								
4.								
5.								
Overall								

$$\textit{Total audit score} = \frac{\textit{Number menu standard met}}{\textit{Total number of menu audited}} \times 100\%$$

Acceptable audit score (100%) ☐ MET ☐ NOT MET

COMMENTS		
CONCERNS IDENTIFIED	**CORRECTIVE ACTION (include date of each action)**	**STAFF RESPONSIBLE**
	Date of next audit:	

(d) Dining Environment Audit (optional)

Name of auditor:	Location:	Date of audit:	Meal procedures observed:

Y = Yes, N = No, E = Exception

		Y	E	N
1.	In-service training on assisted eating and feeding skills is provided to all relevant staff as needed.			
2.	Dining area provides adequate space for all people to manoeuvre.			
3.	Lighting and temperature in the dining room is appropriate.			
4.	Dining area provides a pleasant and social environment.			
5.	Distractions such as TVs and loud music are minimised at meal times.			
6.	Cutlery and dishes are visually appealing and suited to the needs of those in care. They are not cracked, chipped or discoloured.			
7.	Dining room furnishings and table set up are suited to those in care.			
8.	Meals are served at posted times.			
9.	People are offered assistance with meals in a timely manner.			
10.	Pace of meal service is appropriate (e.g. not too rushed or too long between courses of meal service).			
11.	Measures are in place to ensure appropriate food and beverage temperatures are maintained throughout meal service.			
12.	For those requiring pureed foods, menu items are served separately rather than mixed together.			
13.	Safe feeding practices are demonstrated (e.g. positioning, technique) at meals and snacks.			
14.	Seconds helpings and beverage refills are offered if appropriate.			
15.	There is sufficient food provided (e.g. the kitchen did not run out of a menu item).			
16.	Staff who serve food are observed to be polite and respectful to those in care. Dining room conversations are directed to persons in care.			
17.	Food and fluids intake is encouraged.			
18.	Food Safety and sanitation practices are observed at meals and snacks.			
	Total (Y,E)			

$$\textit{Total audit score (\%)} = \frac{\textit{Total (Y + E)}}{18} \times 100\%$$

Acceptable audit score (100%) ☐ MET ☐ NOT MET

COMMENTS		
CONCERNS IDENTIFIED	**CORRECTIVE ACTION (include date of each action)**	**STAFF RESPONSIBLE**
	Date of next audit:	

(e) Food Service Satisfaction Survey

Name of auditor:	Number of questionnaire returned:	Number of questionnaire distributed:	Overall response rate:	Date of audit:

Question	#Yes	#No	#Does not apply	Total #responses	Score for questions (%) $= \frac{\#Yes}{\#responses} \times 100$
1. Do you enjoy the food you are served?					
2. Does the food taste good?					
3. Does your food look good?					
4. Are hot food served hot enough?					
5. Are cold food served cold enough?					
6. Are you usually getting enough to eat?					
7. Do you eat most of the food you receive at each meal?					
8. Are you given enough time to finish your meals?					
9. If you do not like the meal served, are you offered another choice?					
10. Do you receive adequate help at mealtimes?					
11. If you are on special diet, do the foods we offer meet your needs?					
12. Is your table setting clean and neat?					
13. Do you enjoy eating with your tablemates?					
14. Are suggestions about meal service dealt with to your satisfaction?					
15. Do we met your personal, cultural or religious food preferences?					
16. Are those who serve your meals pleasant and friendly?					

Acceptable audit score (100%) ☐ MET ☐ NOT MET

COMMENTS		
CONCERNS IDENTIFIED	**CORRECTIVE ACTION (include date of each action)**	**STAFF RESPONSIBLE**
	Date of next audit:	

Appendix J:

Comparison of Food Group Distribution for 1200kcal, 1500kcal, and 1800kcal in HPB's Serving Size and Food Exchange Format

The tables below compare the food group distribution in HPB's recommended serving size and food exchange format. The definition of one exchange for each food group is defined as below:

Food group	Carbohydrate	Protein	Fat
Starch, grains	15g	2g	0.5g
Fruit	10-15g	-	-
Vegetables (non-starchy vegetables)	-	-	-
Fish, chicken, meat, seafood, legumes*	-	7g	1-4g
Milk, yoghurt, high- calcium soymilk	12g	8g	0-4g

**legumes contain carbohydrate*

(a) Meal plan for 1200kcal

(i) HPB's recommended serving size

	Breakfast	Lunch	Afternoon tea	Dinner	Supper
Brown rice & wholemeal bread	1	1	½	1	½
Fruit		1		1	
Vegetables		1		1	
Meat & others		1		1	
Dairy foods or calcium-rich foods	½				½

(ii) Food exchange format

	Breakfast	Lunch	Afternoon tea	Dinner	Supper
Starch, grains	2	2	1	2	1
Fruit		1		1	
Vegetables		1		1	
Fish, chicken, meat, seafood, legumes		3		3	
Milk, dairy products, high-calcium soymilk	1				1

(b) Meal plan for 1500kcal

(i) HPB's recommended serving size

	Breakfast	Lunch	Afternoon tea	Dinner	Supper
Brown rice & wholemeal bread	1	1 ½	½	1 ½	½
Fruit		1		1	
Vegetables		1		1	
Meat & others		1		1	
Dairy foods or calcium-rich foods	½				½

(ii) Food exchange format

	Breakfast	Lunch	Afternoon tea	Dinner	Supper
Starch, grains	2	3	1	3	1
Fruit		1		1	
Vegetables		1		1	
Fish, chicken, meat, seafood, legumes		3		3	
Milk, dairy products, high-calcium soymilk	1				1

(c) Meal plan for 1800kcal

(i) HPB's recommended serving size

	Breakfast	Lunch	Afternoon tea	Dinner	Supper
Brown rice & wholemeal bread	1	2	½	2	½
Fruit		1		1	
Vegetables		1		1	
Meat & others		1		1	
Dairy foods or calcium-rich foods	½				½

(ii) Food exchange format

	Breakfast	Lunch	Afternoon tea	Dinner	Supper
Starch, grains	2	4	1	4	1
Fruit		1		1	
Vegetables		1		1	
Fish, chicken, meat, seafood, legumes		3		3	
Milk, dairy products, high-calcium soymilk	1				1

When conducting meal audits, dietitian may refer to the comparison tables above to ensure adequate portion is being served for 1200kcal, 1500kcal and 1800 kcal diet, except for therapeutic diet. Dietitians shall act on discretion when conducting meal audits.