

Food-Based Dietary Guidelines of Southeast Asian Countries: Part 2 - Analysis of Pictorial Food Guides

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ABSTRACT

Introduction: Part 2 of the manuscript compares the the main pictorial food guides and food plates of the officially published food-based dietary guidelines (FBDGs) of six countries of the Southeast Asian region. **Methods:** The main pictorial food guides in each of the six FBDGs, together with available explanatory notes, were extracted and analysed in terms of various attributes such as their shapes and graphics, food groupings and their contents and recommended amounts. In addition, food plates, if available in the countries surveyed, were also analysed. **Results & Discussion:** All the six countries surveyed adopted different pictorial food guides. Indonesia uses a culinary icon, a cone-shaped rice dish, while Thailand uses an inverted food pyramid. The food pyramid is used in the other four countries, namely Malaysia, Philippines, Singapore and Vietnam. While differing in their visual presentations and several minor details, the six pictorial food guides are similar in their essential attributes. Indonesia, Philippines and Singapore have introduced the food plate as additional visual guides. Although there are several differences in the way these three food plates are presented, they are based on the same basic concept of imparting the message of balance and proportionality among the major food groups. Additional related images or messages provided include drinking enough water, personal hygiene and increasing physical activity. **Conclusion:** The pictorial food guides and food plates of the countries surveyed all aimed to serve as simple nutrition education tools in encouraging the population to adopt healthy diets. They are all based on the principles of variety, proportionality and balance.

Key words: Food-based dietary guidelines, food plates, food pyramids, pictorial food guides, public health nutrition, Southeast Asia

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INTRODUCTION

Food-based dietary guidelines (FBDGs) are a set of advisory statements that provide dietary advice for the population for the purpose of promoting health and preventing nutrition-related deficiencies and excesses. FBDGs may also include advice on other food and health related issues, such as food safety, physical activity, and healthy lifestyle. With the objective of comparing the FBDGs of countries in the region, the Southeast Asia Public Health Nutrition (SEA-PHN) Network¹ undertook a project to compile and analyse the official dietary guidelines of countries in Southeast Asia. The key messages and scientific rationale of six FBDGs in the region are published in Part 1 of this Supplement (Tee *et al.*, 2016).

All the FBDGs of the countries analysed also included pictorial food guides to further assist the public in understanding and following the dietary messages. Such food guides are visual representations that graphically translate the FBDGs into a single illustration, addressing the recommended pattern of the total diet that embodies the over-all message in the FBDGs. Generally, food guides show individual food groups divided according to their nutritional values. Each group usually depicts illustrative foods that are commonly consumed in the customary diet. By varying the size of the different food groupings, food guides illustrate at least three important messages that constitute a healthy diet, namely, variety, proportionality and balance. The message of variety is depicted by including all food groups that constitute a normal diet; the messages of proportionality and

balance are shown by the different sizes of the food groupings designed to supply proper proportions of foods and to obtain adequate foods and nutrients in a proper balance. Being graphic illustrations, food guides primarily serve as a tool for nutrition education and behaviour change, at the same time as symbols in a country's nutrition education and communication strategy (FAO, 2015)

Part 2 of this Supplement compares the pictorial food guides in the six FBDGs compiled from the Southeast Asian countries. These visual guides will be analysed in terms of various attributes such as their shape and graphics, food groupings and their contents and recommended amounts, as well as any other associated messages. The commonalities and differences among the different pictorial guides will be identified. This analysis will enable us to draw important lessons from the various factors and considerations that went into their formulation. This compilation of the pictorial food guides in the region can serve as a reference for other countries that intend to develop or revise their own pictorial guides based on their respective national FBDGs.

METHODS

The method of obtaining the official FBDGs of Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam for the purpose of this project has been described in Part 1 of this Supplement (Tee *et al.*, 2016). The main pictorial food guides in each of these FBDGs, namely food pyramids and similar guides, together with available explanatory notes, were extracted and analysed for this part of the publication.

¹ The Southeast Asia Public Health Nutrition (SEA-PHN) Network is a partnership of key stakeholders in the region, namely nutrition societies/associations and corporate companies, dedicated to promoting public health nutrition among the population and alleviating nutrition problems in the region (<http://sea-phn.org>). Authors are founding members of the SEA-PHN Network Council.

To aid in the comparison and analysis, a matrix of the major attributes and key messages of the food guides was prepared. Basically, the food guides were compared according to their food categorisation and quantitative recommendations. In particular, comparison and analysis were made on their shape and number of levels, the food groups and illustrative foods in each group, the relative sizes of the food groups, and the recommended amounts of each of the food groups, as well as other health related messages.

In addition, food plates, if available in the countries surveyed, were also compiled and analysed. The plates were analysed in the way they are apportioned for the different major food groups as well as other accompanying images or messages.

RESULTS

Features of the main country pictorial food guides

All the six countries in the survey adopted different visual presentations for their pictorial food guides. The main pictorial guides include pyramids, *tumpeng* (a cone-shaped structure), and flag (inverted pyramid) (Appendix, 3, Figures 1-6). An analysis of the make-up of each visual guide, e.g., the levels of the pyramid or *tumpeng* or flag, and the accompanying serving sizes or messages, if any, are provided in Table 1. In addition, three countries, namely Indonesia, Philippines and Singapore, introduced a food plate as an additional guide to the consumer (Appendix 4, Figures 7-9). An analysis of the plates and related messages are provided in Table 2.

Indonesia uses a cone-shaped *tumpeng* (locally called *Tumpeng Gizi Seimbang* (TGS)) in advising the population on balanced diet and healthy eating (MOH Indonesia, 2014). The *Tumpeng* is a cone-shaped rice dish, traditionally featured in the *slamatan* ceremony and has been recognised as a culinary icon (Appendix 3, Figure 1). The *Tumpeng Gizi Seimbang*

consists of four layers, with the layers becoming smaller from bottom to top. The largest layer at the bottom depicts cereals and root crops; the second, divided into a slightly larger area shows vegetables and a slightly smaller area shows fruits; the third layer shows commonly consumed animal foods and beans; and the smallest topmost layer in the form of a cone illustrates fats and oils, sugar and salt. An illustration of a glass of water is included next to the *tumpeng*. The cone is placed in a large tray as its base, decorated with symbols of washing hand, various exercises and a person with a weighing scale. With these decorations, the TGS intends to convey the four principles of healthy life style: variety of food to meet individual requirement, cleanness and food safety, regular activity and sport, and ideal weight monitoring (Soekirman, 2011).

Malaysia uses the three-dimensional Malaysian Food Pyramid 2010 with four levels (Appendix 3, Figure 2) as a visual tool in guiding the population in designing a healthy diet (NCCFN Malaysia, 2010). It is intended as a guide to provide a framework for the types and amounts of food that should be eaten in combination to provide a healthy diet. Each level represents different food groups (from bottom to top: rice, noodle, bread, cereals, cereal products and tubers group; vegetables and fruits group; milk and milk products, fish, poultry, meat and legumes group; fat, oil, sugar and salt group) with the size and area of each food group becoming smaller from bottom to top, indicating that one should eat more of the foods at the base whereas the foods at the top of the pyramid should be consumed less. Recommended number of servings per day for each food group is indicated beside each food group.

Daily Nutritional Guide (DNG) Pyramid is used as a nutritional pictorial guide for Filipinos (Appendix 3, Figure 3) (FNRI Philippines, 2008). The Philippines has developed individual pyramids for

Table 1. Pictorial food guides and related key messages used in FBDCGs of six Southeast Asian countries

	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Name of pictorial guide	<i>Tumpeng Gizi Seimbang</i> (Figure 1*)	Malaysian Food Pyramid 2010 (Figure 2*)	Daily Nutritional Guide Pyramid for Filipino Adults (Figure 3*)	Singapore's Healthy Diet Pyramid 2009 (Figure 4*)	Nutrition Flag Healthy Eating for Thais (Figure 5*)	Vietnam Food Guide Pyramid (Figure 6*)
Format	<i>Tumpeng</i> , (cone-shaped)	Pyramid	Individual pyramid based on different age groups	Pyramid	Flag, inverted pyramid shape	Pyramid
No. of levels	5	4	6	4	4	7
Cereals & products, tubers	3-4 portions/ day	Eat adequately, 4-8 servings/ day	5-8 servings/ day	Select more, 5-7 servings/ day (2-3 servings should be whole-grain products)	8-12 rice-serving spoons	Eat adequately, 12kg of staple food/ month
Vegetables	3-4 portions/ day	Eat plenty, 3 servings/ day	3 servings/ day	Select more, 2 servings/ day	4-6 rice-serving spoons	Eat more, 10kg of vegetables/ month
Fruits	2-3 portions/ day	Eat plenty, 2 servings/ day	2-3 servings/ day	Select more, 2 servings/ day	3-5 portions	Eat adequately, as much as possible / month
Milk & milk products	NA	Eat in moderation, 1-3 servings/ day	1 glass/ day	3 servings/ day (1/2 serving should come from dairy or other high calcium products)	1-2 glasses	NA
Fish, poultry, meat, eggs, legumes	2-4 portions/ day	Eat in moderation, 1/2-2 servings of poultry, meat, egg/ day; 1 serving of fish/ day; 1/2-1 serving of legumes/ day	Fish, shellfish, meat & poultry, dried beans & nuts 3-4 servings/ day; egg 1 piece/ day	NA	6-12 tablespoons	Eat moderately, 2.5kg of fish/aqua products/ month; 1.5kg of meat/ month; 2kg of tofu/ month

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	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Fat, oil, sugar, salt	Limit sugar intake - 4 tablespoons/ day; Salt - 1 tablespoon/day Oil - 5 tablespoons /day	Eat less; no quantitative recommendation	Sugar/sweets 5-8 tsps/day; Fats & oils 6-8 tsps/day	Select less, use in small amounts; no quantitative recommendation	Eat only in limited amounts	Eat fat moderately, 600g of fats, oils sesame, peanuts/ month; eat less sugar, 500g of sugar/month; limit salt intake, less than 180g of salt/month
Water	8 glasses of plain water/day	NA	8 glasses/day	NA	NA	NA
Physical activity	Play football, walk, exercise, do housework, integrated exercise	- Be active everyday in as many ways as you can - Accumulate at least 30 min/ day of moderate intensity physical activity on at least 5-6 days a week, preferably daily - Participate in activities that increase flexibility, strength and endurance of the muscle as many as 2-3 times a week - Limit physical inactivity & sedentary habits	Do regular exercise in most days of the week for at least 30 min	NA	NA	NA
Personal hygiene	Practise hand washing	NA	Practise good personal and environmental hygiene	NA	NA	NA

* Figures 1-6 are in Appendix 3

NA = not mentioned in image of pictorial food guide

Table 2. Food Plates and related messages in FBDGs of some Southeast Asian countries

	<i>Indonesia</i>	<i>Philippines</i>	<i>Singapore</i>
Name of plate	Piring Makanku: PorsiSekaliMakan (My Food Plate: servings each meal) (Figure 7*)	Pinggang Pinoy (Healthy Food Plate for Filipino Adults) 2014 (Figure 8*)	My Healthy Plate 2014 (Figure 9*)
Division of the plate for major food groups			
Cereals & products, tubers	1/3 of the plate	1/3 of the plate	¼ of the plate (whole grain)
Vegetables	1/3 of the plate	1/3 of the plate	½ of the plate
Fruits	1/6 of the plate	1/6 of the plate	
Milk & milk products	NA	NA	NA
Fish, poultry, meat, eggs, legumes	1/6 of the plate	1/6 of the plate	¼ of the plate
Additional messages outside the plate			
Fat, oil, sugar, salt	Limit intake of sugar, salt and fat/oil	NA	Use healthier oils
Water	1 glass of plain water	1 glass of plain water	Choose water
Physical activity	NA	NA	Be active
Personal hygiene	Wash hands before eating		NA NA

* Figures 7-9 are in Appendix 4

NA = not mentioned in image of plate

different age groups. For the purpose of this compilation and analysis, the DNG Pyramid for Filipino Adults (20-39 years old) is used. The DNG Pyramid serves as a simple, trustworthy guide for the Filipinos in choosing a healthy diet. In accordance with the concept of food pyramids, the Philippines' DNG Pyramid builds from the base and showing that one should eat more foods from the bottom layer. The pyramid has 6 levels. The lowest level, slightly separated from the rest of the pyramid, depicts physical activity and exercise as an essential element of healthy living. The base of the pyramid emphasises the importance of hydration with water and fluids. The next level shows cereals and root crops, followed by vegetables and fruits, the next, fish, meat, poultry, milk, cheese and beans, and the tip of the pyramid shows fats and oils and sugar. The recommended amounts for each food group are shown on the side of the pyramid.

The Healthy Diet Pyramid 2009

(Appendix 3, Figure 4) is the visual tool used to convey healthy eating messages to Singaporeans. Singapore's Healthy Diet Pyramid is a four layer-pyramid, with rice and other complex carbohydrate foods forming the base of the pyramid, followed by fruits and vegetables equally divided at the second level. Meat and other types of protein-rich foods are placed on the third tier; and finally, at the top of the pyramid lie fats, oils, sugar and salt (Lee, 2011). The same general concept of food pyramids is adopted: food eaten daily should come most from the base and least from the tip of the Healthy Diet Pyramid. The number of servings recommended for a day is indicated beside each food group.

Thailand uses Nutrition Flag (Appendix 3, Figure 5) as a visual representation of national Thai food guide in efforts to promote a proper diet for good health (MOPH Thailand, 2001). It is based on the Thai's 'Food-Based Dietary Guidelines for Good Health' and designed

to suggest 'portion', 'quantity' and 'variety' of food required daily for Thai people. The Nutrition Flag may be likened to an inverted food pyramid and is based on the same principle as the latter. The triangular flag is divided into four levels: the widest at the top shows grains and other starchy foods; the second, divided into a larger vegetable group and a smaller fruit group; the third, divided into two groups – a smaller milk group and a larger meat, legumes and egg group; and the tip of the flag showing oil, sugar and salt. The recommended amounts of the food groups to be consumed are shown in household serving units.

“Proper Nutrition is the Foundation of Good Health” is the theme of Vietnam’s pictorial food guide (Appendix 3, Figure 6). The guide is shaped as a pyramid like that of Malaysia, Philippines and Singapore, and follows the same principle. However, the Vietnam pyramid differs from that of the other countries in that it has seven levels depicting common foods consumed in Vietnam, starting with staple foods at the bottom, followed by vegetables in the second level. Fruits are placed in the third level, followed by protein-rich foods in the fourth level. Fats and oils are in the fifth level, sugar in the sixth level, and finally salt occupying the tip of the pyramid. On the right side of the pyramid are stated qualitative recommendations on the relative amounts to be consumed, i.e., eat adequately is advised for staple foods as well as for fruits, eat more is advised for vegetables, eat moderately for protein-rich foods, and for fats and oils, sesame and peanuts, eat less for sugar, and limit intake for salt. On the left side of the pyramid are stated quantitative recommendations of the average intake for an adult for a month: 12 kg of staple food, 10 kg of vegetables, fruits to be consumed as much as possible, 2.5 kg of fish and aqua products, 1.5 kg of meat, and 2 kg of *tofu*, 600 g of fats, oils, sesame and peanuts, 500 g of sugar, and less than 180 g of salt. It can be noted

that these quantitative recommendations differ from food pyramids of countries that provide guidance on amounts to be consumed daily.

Although these are pictorial food guides, some countries have also emphasised the importance of physical activity through these guides. Indonesia added several images of people performing physical activities below the *tumpang* (Appendix 3, Figure 1). Philippines included a key message to do regular exercise at the bottom part of the pyramid (Appendix 3, Figure 4). Vietnam also included two images of physical activity at the bottom of the food pyramid (Appendix 3, Figure 6). Malaysia has taken a different approach and provided a separate physical activity pyramid. In addition, Indonesia also included an image of a person measuring body weight and a glass of water as a reminder of the importance of weight control and water intake. Philippines food pyramid has also included a reminder on importance of personal and environmental hygiene at the bottom. The base of the pyramid has illustrations and messages on drinking enough water and beverages.

The food plate as an additional pictorial food guide

In recent years, some countries have begun to introduce the use of a food plate as an additional pictorial guide to the population. In this region, Indonesia, Philippines and Singapore have introduced the use of their respective food plates.

Indonesia introduced a food plate, *Piring Makan Ku*, or My Food Plate (Appendix 4, Figure 7) to complement the TGS by guiding the selection of appropriate portion size for the different food groups at each meal. The plate is divided into 4 portions or slices, with two large slices of equal size, each occupying a third of the plate, one depicting cereals and root crops and the other, vegetables. The two smaller portions of equal size on the plate each occupying a sixth of the plate, depict

fruits and protein-rich foods respectively.

The *Pinggang Pinoy* or Healthy Food Plate for Filipino Adults (Appendix 4, Figure 8) is an easy to understand visual food plate model developed by the Philippines to help the population adopt a balanced meal and healthy eating habits at meal times (DHRP Philippines, 2014). It can be used side by side with the DNG Pyramid as a simpler illustration of a balanced diet. The plate shows four slices depicting the recommended proportions of the principal food groups to eat in a meal: the larger but equal slices of cereals (represented by rice) and vegetables, together with the smaller but equal slices of fruits (represented by banana) and protein source (represented by fish). The well known classes of foods popular with the population, categorised as “Go”, “Grow” and “Glow” foods are at the periphery of the plate. While the *Pinggang Pinoy* conveys the right proportions of the major food groups, the Pyramid shows recommendations for the whole day food intake.

A study conducted by Health Promotion Board Singapore (HPB Singapore, 2014) indicated that Singaporeans prefer a simple, plate-based image that conveys clear messages about a healthy diet. Thus, My Healthy Plate was developed in 2014 with the aim to provide an easy-to-understand visual representation of a balanced and healthy diet that can help with weight control and protect against chronic diseases (HPB Singapore, 2014) (Appendix 4, Figure 9). The Plate is divided into 3 portions; fruits and vegetables occupy half of the plate, brown rice & wholemeal bread a quarter and meat & others occupy the remaining quarter. The Plate emphasises on increasing fruit and vegetable intake and changing rice, noodles, bread and other carbohydrate-rich foods to whole-grain options.

Besides providing guidance on the amounts of the main food groups to be consumed in each meal, all the 3 plates also provide additional related messages

outside the plate. In the Indonesian My Food Plate, three other messages are also included by the side of the plate through text and/or images, namely drink sufficient water, wash hands before meals and reduce intake of sugars, salt and fats/oil (Figure 7). The Philippines Healthy Food Plate also has added a glass of water by the side of the plate (Figure 8). In the case of the Singapore My Healthy Plate, three additional messages and images have been included to remind Singaporeans to choose water over sweetened beverages, choose foods prepared with healthier oil as well as be being physically active (Figure 9).

DISCUSSION

Comparison of the main pictorial food guides

All the FBDGs of the six Southeast Asian countries in this survey have their own pictorial food guides to assist the public in making food choices and appropriate amounts. While they are different in their visual presentations – Indonesia’s guide is in the form of an culinary iconic rice dish (*tumpeng*) and Thailand’s is an inverted triangular flag, while that of Malaysia, Philippines and Singapore are standing pyramids - they are in fact similar in their essential attributes. Firstly, all the pictorial guides are based on the principle of relativity or proportionality of the different food groups to consume, placed at different levels of the pictorial guide. Foods placed at the broader part of the guide are to be consumed more than those at the upper/lower parts of the structure. The pictorial guides basically have four to five layers. Although the Vietnam pyramid has seven layers, the last three at the tip are basically further elaboration of fats/oils, sugar and salt.

The major food groups depicted in the pictorial guides are strikingly similar for all the countries, reflecting similarities in dietary pattern of communities in the region. They comprise cereals (most often rice), grains and tubers; vegetables;

fruits; meat, fish, poultry, egg and legume products; milk and milk products; fats/oil, sugar and salt. Furthermore, the recommendations for the relative consumption of the different food groups are very similar for all the countries. Staples like cereals and products and tubers form the largest layer and hence are recommended to be consumed the most, relative to the other groups. These foods are recognised by all the six countries to be the major suppliers of dietary energy. The second largest layer is vegetables and fruits, recommended to be consumed more. This indicates the general agreement amongst countries that these are good sources of micronutrients, phytonutrients and dietary fibre. The next smaller layer, further up/or down the pictorial guide are foods such as meat, poultry, fish, eggs. All the countries have also placed legumes and products in this level as alternatives to meat products. These protein-rich foods provide the main dietary components for growth and maintenance of body tissues and are recommended for consumption in moderate amounts. Fats/oils, sugar and salt are invariably the smallest layer of the pictorial guide, placed at the tip. There is general agreement that they are to be consumed the least as they are linked to various diet-related chronic diseases.

All the pictorial food guides have also placed a variety of foods with similar nutritional value for each food group within the same level. The public is advised to consume a variety of foods within each food group, using the different foods as alternatives.

Thus all the pictorial food guides clearly illustrate the major elements that constitute a normal diet – variety, proportionality and balance, at the same time conforming to the main message of their respective FBDGs and the cultural practices of the countries.

However, there are noticeable differences in the various pictorial food guides (Table 1). Milk and dairy

products are grouped together with other protein-rich foods in the case of the guides in Indonesia and Singapore. On the other hand, these foods are given greater emphasis in the case of Malaysia, Philippines and Thailand, being distinctly separated, though on the same level of the pyramid, and the recommended amount for consumption is provided.

The countries in the survey adopted different approaches to present the recommendations for the consumption of the various food groups. Indonesia, Philippines and Thailand used quantitative recommendations for all food groups in the visual guides. Thailand's pictorial guide has also adopted a quantitative recommendation for all food groups except for fat/oil, sugar and salt. No country's pictorial guide has used only qualitative terms. Malaysia, Singapore Vietnam have provided both quantitative and qualitative recommendations. The latter include terms such as eat adequately, eat plenty, select more, eat in moderation and use or select less. There are pros and cons in the use of quantitative or qualitative approaches. The public may find the use of quantitative approaches such as the use of serving or portion sizes too difficult to comprehend and use. The use of qualitative description terms presumably help in consumer understanding of the recommendations in the pictorial guides. However, they are rather non-specific and may not be helpful to the public. Perhaps that is the reason why some countries have opted to use both approaches.

In terms of quantitative recommendations, there are considerable differences in the recommended amounts of the various food groups and the modes of expression. Thailand uses household serving units i.e. rice-serving spoons, tablespoons and glasses as units of measurement; Vietnam uses gram or kilogram, while the others use customary serving size. While the recommended amounts of the food groups in the

pictorial guides of Indonesia, Malaysia, the Philippines, Singapore and Thailand are for a day's intake, the quantitative recommendation in the case of Vietnam's guide is for the average intake of an adult for a month.

A range of servings (e.g. 2-3 servings) has been recommended for some food groups for some of the countries, especially for rice and the cereal grains group, meat, fish and eggs group and milk and milk products group. For fat/oil, sugar and salt, Philippines and Vietnam have placed these in separate levels of the food pyramid and also provide quantitative recommendations in teaspoons and grams respectively. The other four countries recommended these be consumed "the least" or "to reduce consumption" with no quantitative amounts.

It is noteworthy that the pictorial food guides of Indonesia and the Philippines have included several other recommendations, namely importance of personal hygiene, physical activity, monitoring body weight and drinking water. Vietnam has included a message to encourage physical activity through the use of two images at the bottom of the pyramid. Malaysia has a separate pictorial guide for physical activity, in the form of a pyramid that gives recommendations on the form and frequency of various types of activities. It follows the same principle of a food pyramid in that activities depicted at the bottom and larger layer of the pyramid are to be carried out more often than those at the higher levels.

An earlier review of pictorial food guides used in 12 countries from different parts of the globe by Painter, Rah & Lee (2002) also reported similar findings. A variety of shapes of pictorial food guides were reported in the review, including pyramids, circle, pagoda, rainbow and plate. In spite of these differences in the shapes of the guides, there was a remarkable similarity in the basic food groupings of

the guides in all countries. There were minor differences in food categorisation and differences in recommended serving sizes. However, it was reported that the core recommendation for individuals to consume large amounts of grains, vegetables and fruits with moderate intake of meat, milk and dairy products was consistent in all the pictorial food guides included in that review. Although the review was carried out over a decade ago, it can be noted that the recommendations in all the international food guides have recommended consumption of cereal grains (high carbohydrate foods) the most, as in the case of the food guides in the present study.

Comparison of food plates

It is interesting that in recent years, Indonesia, the Philippines, and Singapore have begun to use the food plate, in addition to the food pyramid (Table 2). The food plates used in all three countries are simple nutrition education tools that impart the message of balance and proportionality among the major food groups - energy-rich foods, foods rich in micronutrients and dietary fibre, and protein-rich foods. However, there are several differences in the way the food plates are presented. While those of Indonesia (Appendix 4, Figure 7) and the Philippines (Appendix 4, Figure 8) have four slices on the plate, that of Singapore has only three (Appendix 4, Figure 9). Those of Indonesia and the Philippines show equal slices for energy-rich foods and vegetables and smaller but equal slices of fruits and protein-rich foods. Both the food plates of Indonesia and the Philippines include a glass of water to remind the population of the need for proper hydration. In the case of the Philippines plate, the terms "Go", "Grow" and "Glow" are used in association with staple foods, protein-rich foods and vegetables and fruits respectively. These terms are used on the plate as they have

been used in nutrition education for a long time and are familiar to the population. The food plate of Singapore (Table 2, Figure 9) has only 3 slices with fruit and vegetables occupying half of the plate, and brown rice and wholemeal bread, and meat and others, occupying one fourth of the plate each, signifying the relative importance of these food groups to the recommended Singaporean diet.

CONCLUSIONS

All the six Southeast Asian countries in this compilation of country FBDGs have recognised the usefulness and importance of a pictorial food guide to assist the population in making food choices. The six pictorial food guides analysed in this paper, contained in the FBDGs of Indonesia, Malaysia, the Philippines, Thailand, Singapore, and Vietnam, while differing in their visual presentations, are based on the same concept and are similar in their essential attributes. There are, however, some differences in details, for example, the different ways by which milk, fats and oils, sugar, salt, physical activity, and water are depicted, showing the differing emphasis placed on these food items by the countries. There are also minor differences in recommended amounts and the units of measurements used.

While food pyramids and similar guides provide a visual guide to the concept of relativity of the different food groups to consume, food plates provide guidance to the consumer on the relative amounts of major food groups for a specific meal. The food plate has therefore been felt useful for purposes of individual counselling. Indonesia, Philippines and Singapore have introduced food plates as additional educational guides to consumers. Malaysia is also currently developing a plate to complement the food pyramid. The general principle and concept of the food plates of the three countries are similar. However, there are also differences in terms of the

sizes of the slices depicting the four major groups.

On the whole, the pictorial food guides and food plates of the countries surveyed have the same common purpose of encouraging the population to adopt a healthy diet based on the principles of variety, proportionality and balance. They all aim to function as simple nutrition education tools to teach the concept of a nutritious and balanced diet to the general public.

All the food pyramids and similar pictorial food guides reviewed have included recommended serving sizes for the different food groups. These are usually in the form of recommended amounts to be consumed in a day. Examples of what is a serving of the various food groups are often provided. One main difficulty in educating the population on the use of food pyramids and similar guides is in explaining serving sizes. Consumers often find it difficult to understand and imagine what is the serving size of a particular food group. There has to be a better understanding of how consumers perceive food pyramids and the related serving sizes. This will enable greater efforts to encourage the public to make use of these visual guides in making appropriate food choices.

In recent years, food plates have become acceptable additional visual tools in more countries in the region. It is important to monitor how consumers understand these new tools and if they are indeed useful in helping consumers make food choices.

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Conflict of interest

The authors declare that they have no conflict of interest in undertaking this work.

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Appendix 3. Images of pictorial food guides and related key messages used in FBDGs of six Southeast Asian countries



Figure 1. *Tumpeng Gizi Seimbang* of Indonesia

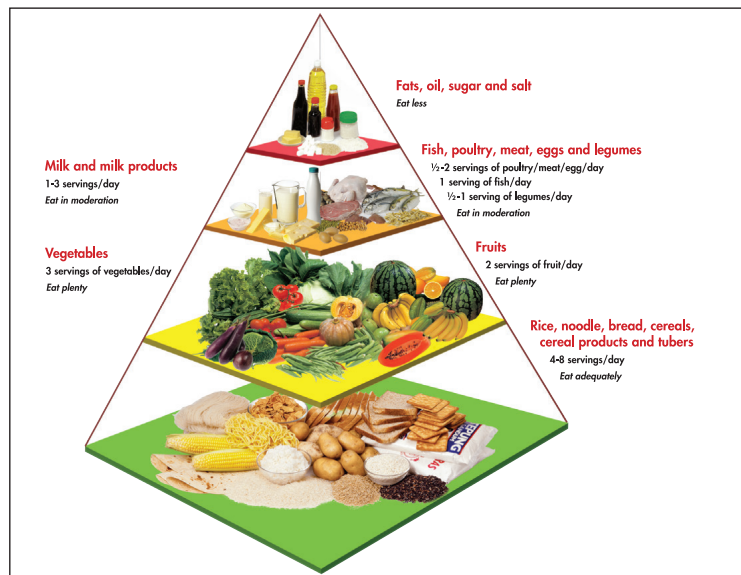


Figure 2. Malaysian Food Pyramid 2010

Appendix 3. — Continued

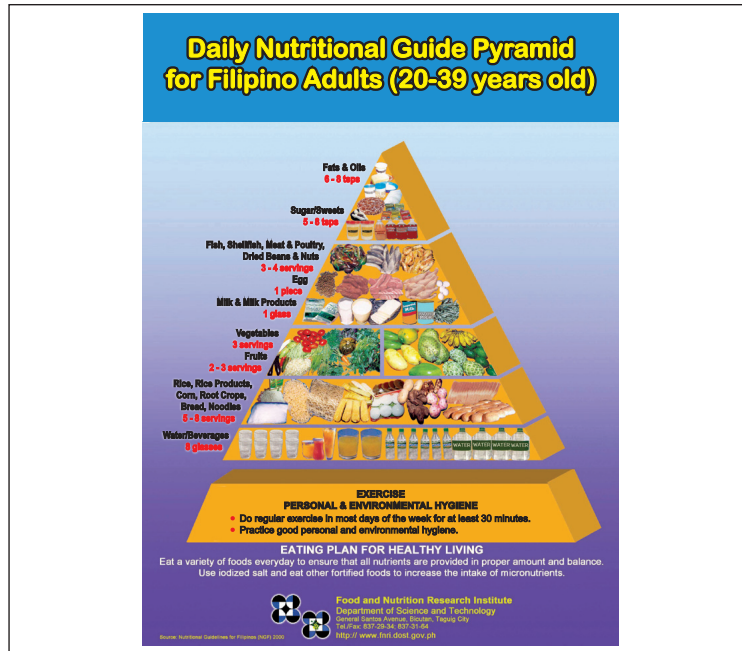


Figure 3. Daily Nutritional Guide Pyramid for Filipino adults

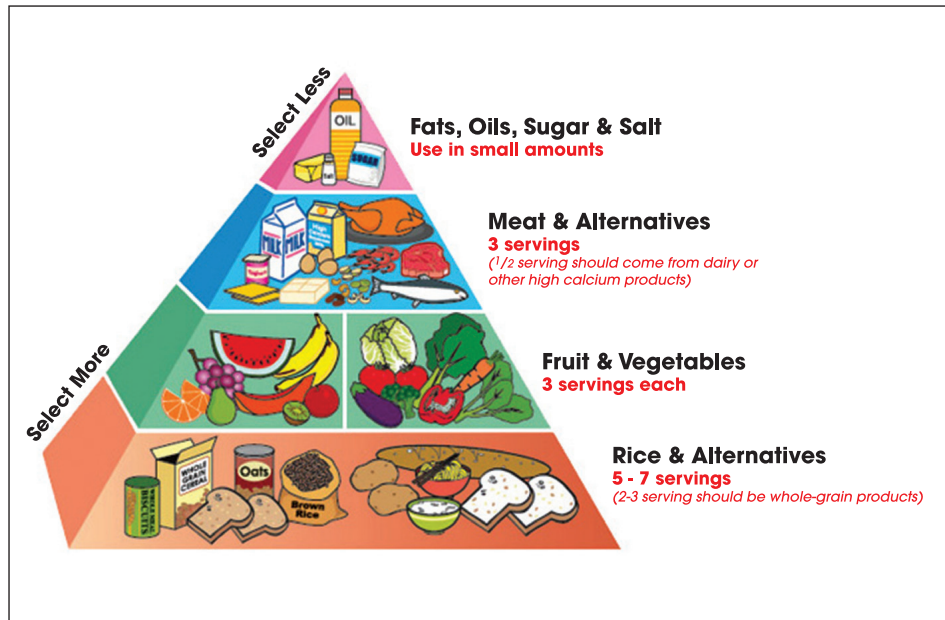


Figure 4. Singapore's Healthy Diet Pyramid 2009

Appendix 3. — Continued



Figure 5. Nutrition Flag Healthy Eating for Thais

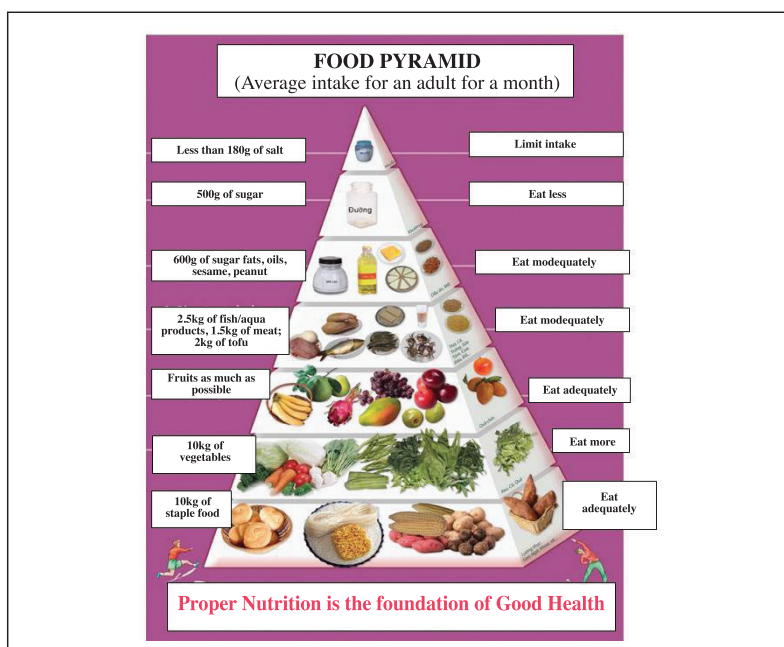


Figure 6. Vietnam Food Guide Pyramid

Appendix 4. Images of food plates and related messages used in FBDGs of some Southeast Asian countries

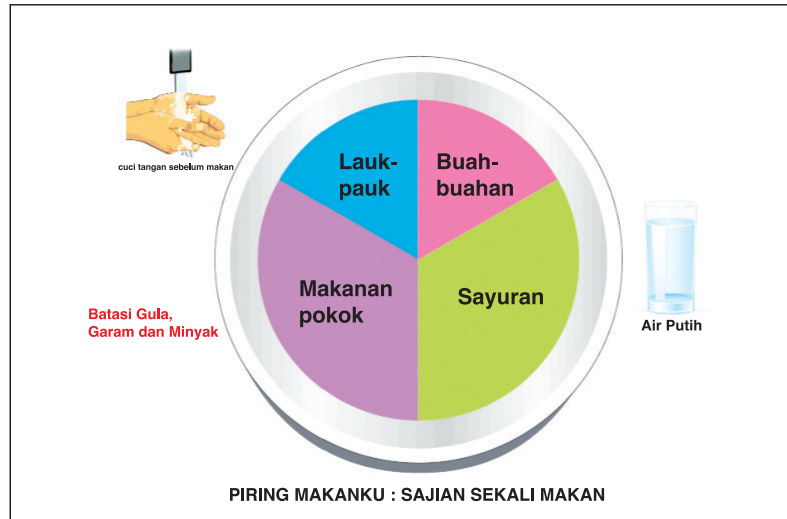


Figure 7. My Food Plate (servings each meal) of Indonesia
Piring Makan ku: Porsi Sekali Makan



Figure 8. Healthy Food Plate for Filipino adults, 2014 of the Philippines (*Pinggang Pinoy*)

Appendix 4. – Continued



Figure 9. My Healthy Plate 2014, Singapore