

## Review

# Dietary Guidelines in Singapore

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The 2011 Dietary Guidelines were developed with the aim of providing guidance on what dietary strategies can best address increasing rates of obesity and non-communicable chronic disease in Singapore. This set of dietary guidelines was developed with a local expert committee based on a review of scientific literature and data on current dietary patterns from the 2010 National Nutrition Survey. Projected nutrient intakes from a diet adhering to the 2011 Dietary Guidelines were calculated using a local food composition database (FOCOS) and validated against nutrient recommendations. Acknowledging that dietary requirements differ between age groups, different sets of dietary guidelines have been developed and customised for different segments of the population. To date, Singapore has produced dietary guidelines for children and adolescents (focusing on establishing healthy life-long eating patterns), adults (focusing on preventing obesity and reinforcing healthy eating patterns), and most recently, guidelines for older adults (>50 years of age) that address the issue of potential dietary insufficiency caused by age-related increases in nutrient requirements combined with a reduction in energy requirements. In Singapore, dietary guidelines have been used to inform and direct public policy and promote dietary patterns that meet nutrient requirements while reducing the risk of non-communicable chronic diseases. Examples of public policy include: national guidelines on food advertising and standards for food served in nursing homes; examples of public health promotion programmes include: the Healthier Choice Symbol Programme for packaged food products and programmes encouraging provision of healthier meals in hawker centres, restaurants, and school or workplace canteens.

**Key Words:** dietary guidelines, Singapore, nutrition policy, public health

## INTRODUCTION

Over the past 50-60 years, Singapore has experienced rapid economic development and improvements in healthcare and living standards. This, together with an ageing population, has contributed to disease patterns in Singapore shifting away from infectious disease and nutrient-deficiency diseases, such as xerophthalmia,<sup>1</sup> toward obesity and non-communicable chronic diseases such as cancer and cardiovascular disease.<sup>2,3</sup>

In light of this shift in disease patterns, dietary guidelines were developed in the 1980's to address the role of diet in preventing non-communicable chronic disease.<sup>2</sup> The dietary guidelines released by the National Advisory Committee on Food and Nutrition in 1988 for all Singaporeans aged 2 years and above (Table 1) were based on a review of the science linking diet and non-communicable chronic disease. This set of dietary guidelines also moved away from qualitative, directional recommendations (i.e. eating more or less of certain foods) and specified the quantity of food and nutrients that would constitute a healthy diet.

To aid members of the public in making healthier food choices, Singapore introduced the Healthy Diet Pyramid (Figure 1) in 1995. The Healthy Diet Pyramid was considered more user-friendly than the 1988 dietary guidelines as it translated nutrient-based dietary guidelines into quantifiable recommendations based on actual foods. Given that food-based guidelines were more helpful to Singaporeans than nutrient-based guidelines, updated versions of the dietary guidelines for adults aged 18-65

years and children aged below 18 years (Table 2) released by the Health Promotion Board, Singapore (HPB) in 2003 and 2007, respectively, were also food-based. A separate set of food-based dietary guidelines was deemed necessary for children & adolescents as their dietary needs were considered sufficiently different from that of adults.

## DEVELOPMENT OF THE 2011 DIETARY GUIDELINES

Recognising that nutrient requirements of older adults (i.e. adults above 50 years of age) also differ from that of adults<sup>4</sup> and that Singapore's population was ageing, it was decided that a customised set of food-based dietary guidelines was required for older Singaporeans. "Older" was defined as above 50 years of age as this was the age that coincided with both changes in nutrient requirements and marked increases in prevalence of non-communicable chronic diseases.<sup>5</sup>

Adopting a process similar to that used for the 2003 and 2007 dietary guidelines, HPB convened an expert committee, consisting of representatives from academia, the healthcare sector and the nutrition and dietetics

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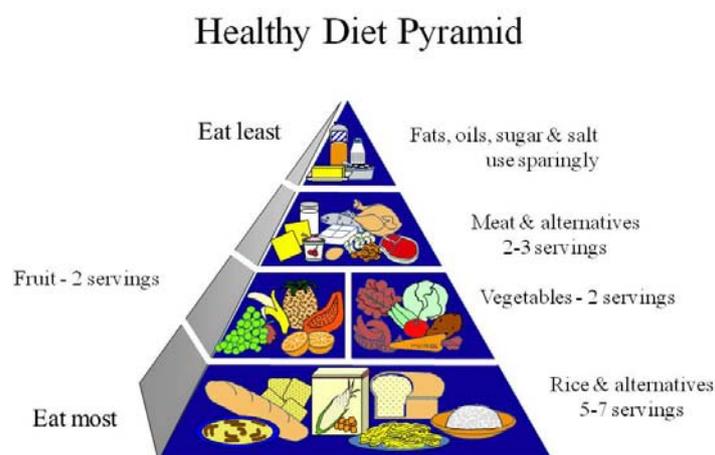
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**Table 1.** Dietary Guidelines for Singaporeans (1988)

Dietary Guidelines for Singaporeans (1988)
<ul style="list-style-type: none"> <li>• Eat a variety of foods</li> <li>• Maintain a desirable body weight. Lose weight if obesity is a problem</li> <li>• Restrict total fat intake to 20-30% of total energy intake</li> <li>• Modify composition of fat in the diet to consist of: 1/3 PUFA, 1/3 MUFA, 1/3 SFA</li> <li>• Reduce cholesterol intake to less than 300 mg/day</li> <li>• Maintain intake of complex carbohydrates at about 50% of total energy intake.</li> <li>• Reduce intake of refined &amp; processed sugar to less than 10% of total energy intake.</li> <li>• Reduce salt intake to less than 5 g a day.</li> <li>• Reduce intake of salt cured, preserved &amp; smoked foods.</li> <li>• Increase intake of fruits, vegetables &amp; wholegrain products</li> <li>• For those who drink, limit alcohol intake to not more than 2 standard drinks per day (about 30 g alcohol)</li> <li>• Encourage breastfeeding in infants till at least 6 months of age.</li> </ul>

**Table 2.** Food-based Dietary Guidelines in Singapore for adults and children

Dietary Guidelines for Adults 18-65 years of age (2003)	Dietary Guidelines for Children & Adolescents (2007)
<ul style="list-style-type: none"> <li>• Base your diet on the Healthy Diet Pyramid Recommendations</li> <li>• Aim to achieve and maintain a healthy BMI</li> <li>• Eat sufficient amounts of grains, especially whole grains</li> <li>• Eat more fruit and vegetables every day</li> <li>• Choose and prepare food with less fat, especially saturated fat</li> <li>• Choose and prepare food with less salt and sauces</li> <li>• Choose beverages and food with less sugar</li> <li>• If you drink alcoholic beverages, do so in moderation</li> </ul>	<ul style="list-style-type: none"> <li>• Aim for variety and balance</li> <li>• Develop healthy habits</li> <li>• Cut down on saturated fat</li> <li>• Eat enough fruit and vegetables</li> <li>• Go for whole-grains</li> <li>• Bone up on calcium</li> <li>• Limit your salt intake</li> <li>• Watch the sugar</li> <li>• Breastfeeding – Baby’s best beginning</li> </ul>

**Figure 1.** Singapore’s Healthy Diet Pyramid (1995)

community in Singapore, to provide guidance on the first phase of the guideline development process. The expert committee helped to identify diet-related health issues pertinent to Singaporeans; for each identified issue, a systematic review of evidence was conducted, with the quality of the evidence evaluated using the method described by the Scottish Intercollegiate Guidelines Network (SIGN).<sup>6</sup> A summary of the best available evidence, together with recommendations for Singaporeans graded by the expert committee, were compiled into a document – the Dietary Guidelines Scientific Report. Finally, quantitative food group recommendations from the report were compared against the Recommended Dietary Allowances for Singaporeans to ensure that people following the dietary guidelines are able to meet their nutrient require-

ments. We used data on eating patterns from the National Nutrition Survey and a local food composition database, the Food Composition System Singapore (FOCOS), to calculate the nutrient content of food group servings.

The Report initially covered evidence on diet and health pertaining to adults aged 19 years and up, but considering that, despite differing nutrient requirements, food-based recommendations for a healthy diet were generally consistent among individuals of different ages (advice to eat a diet rich in whole-grain products, fruit, vegetables and lean protein-foods and adopt healthier food preparation methods that limit intake of saturated fat, trans fat, sugar and salt would generally be appropriate for most healthy individuals), the scope of the Report was expanded to include evidence relevant to Singaporeans of

all ages. To further ensure that Report recommendations were in line with the current scientific consensus, we approached an external, international expert to review said recommendations.

The next phase of the guideline development process was to use the recommendations of the report to develop and customise food-based dietary guidelines for different segments of the population. Acknowledging that dietary requirements, motivations and concerns about nutrition and health differ between age groups, different sets of dietary guidelines were developed and customised for different segments of the population. The main theme of the 2003 dietary guidelines for adults aged 18–65 years were the need for weight management and a healthy diet in the context of preventing non-communicable chronic diseases. In contrast, the 2007 dietary guidelines for children & adolescents did not focus preventing non-communicable chronic diseases, since children and adolescents were less likely to suffer from such, but focused more on encouraging parents and care-givers to give their children healthy foods in order to establish healthy life-long habits.

Continuing this approach, we selected three main themes for the dietary guidelines for older adults – (1) choose nutrient-dense foods, (2) adopt dietary patterns that protect against non-communicable chronic diseases, and (3) it is never too late to change your diet. The rationale behind these themes was that older adults (especially the “old old” aged 65 years and above) are at greater risk of dietary insufficiency caused by age-related increases in nutrient requirements combined with a reduction in energy requirements,<sup>4</sup> are more likely to develop non-communicable chronic diseases, and, anecdotally, some groups in Singapore take a fatalistic approach towards disease and have the perception that effort on their part will not change their situation. Plain language public education material was developed based on these themes and includes practical advice on how to achieve a healthy diet and pointers for individuals who have difficulty meeting dietary advice (e.g. individuals with dentures).

## APPLICATION OF DIETARY GUIDELINES

Public education based on dietary guidelines is only one part of HPB’s strategy to reduce prevalence of obesity and non-communicable chronic diseases in Singapore. Acknowledging that public health promotion goes beyond

just public education, HPB uses the dietary guidelines to inform and direct public policy and health promotion programmes. Some examples include food service guidelines, food advertising guidelines, and the “Healthier Choice Symbol Programme”.

### *Food service guidelines*

Many people in Singapore eat out, with the ubiquitous hawker centre (government-owned, low-rent, open-air food courts) a popular choice for many. Children and working adults also consume a good number of meals at school and workplace canteens. Dietary guidelines for Singaporeans were used as a basis for how to improve food provided by the food service industry. Generally, guidelines for these food service providers will include more whole-grains and vegetables in their dishes, while selecting ingredients with less saturated fat, trans fat and salt.

More specialised food service guidelines for cooked food served in nursing homes were developed based on the dietary guidelines for older adults. Guidelines for nursing homes were developed with the aim of ensuring that residents of nursing homes were able to receive meals that would meet their nutritional needs, especially since residents of nursing homes tend to be at greater risk of malnutrition.<sup>7</sup>

### *Healthier Choice Symbol programme*

The Healthier Choice Symbol (HCS) is a front-of-pack label for packaged food products used by HPB to help consumers identify products that are healthier than similar types of products. To qualify for the HCS, a food product must meet a range of product-specific standards for nutrients, for example a higher calcium product must meet a minimum level of calcium while not exceeding a maximum level of saturated fat, added sugar and sodium. These standards are informed by the dietary guidelines and are modified when appropriate. For example, a category for calcium-fortified soybean milk products was created when low population intake of calcium was identified as an area of concern.

### *Food advertising guidelines*

HPB is in the process of developing guidelines for food advertising targeted at children. One proposal is that food products that run counter to the dietary guidelines ethos

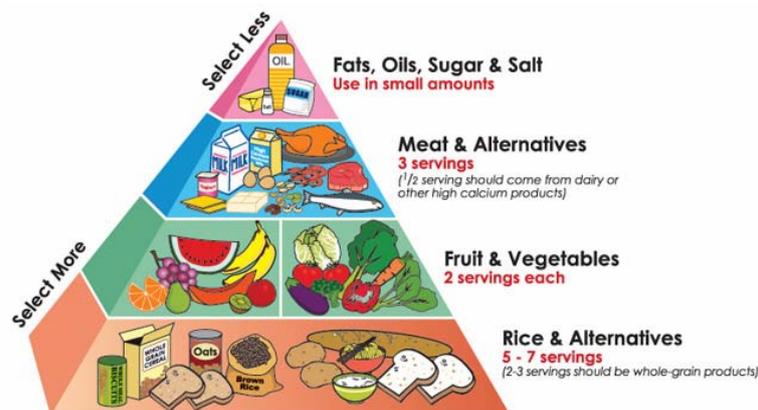


Figure 2. Singapore’s Healthy Diet Pyramid (2009)

of promoting an overall healthy diet should not be allowed to be advertised to children. Similarly, another proposal is that products advertised must be healthier, as defined by the Healthier Choice Symbol programme standards.

#### **FURTHER DEVELOPMENT OF DIETARY GUIDELINES IN SINGAPORE**

The state of science relating to diet and health is constantly evolving and dietary guidelines should be kept up-to-date. For Singapore, the most immediate task at hand is to review the dietary guidelines for adults aged 19-50 years based on the recommendations of the Dietary Guidelines Scientific Report. The challenge would be how to effectively communicate the need to adopt a healthy diet to prevent weight gain and non-communicable disease.

For the foreseeable future, HPB will continue with the existing guideline development process of conducting regular reviews of the scientific evidence followed by developing customised dietary guideline public education material for different segments of the population. Potentially, the next review will be in 2016 or 2017, after the next National Nutrition Survey.

We are also exploring how the dietary guidelines can be better represented graphically for the purpose of public education. The Healthy Diet Pyramid has been updated over the years to better reflect the state of science, the last update being in 2009 to incorporate whole-grains (Figure 2). However, user feedback has indicated that while the Healthy Diet Pyramid is well-recognised, this very familiarity might mean the Pyramid may no longer be able to influence Singaporeans to change their dietary behaviour.<sup>8</sup> Similarly, the United States Department of Agriculture has released a new food guide graphic,<sup>9</sup> stating that the previous MyPyramid “was perceived by many as outdated and too complicated”.<sup>10</sup> HPB is currently identifying viable alternatives to the Healthy Diet Pyramid, and, in light of an increasing prevalence of obesity,<sup>11</sup> testing

the concept of a graphic that helps to address obesity by combining both diet and physical activity guidelines – a “Healthy Lifestyle Graphic”.

#### **AUTHOR DISCLOSURE**

Benjamin LC Lee declares no conflict of interest.

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## 新加坡的飲食指南

新加坡 2011 飲食指南的推展，主要目標是提供良好的飲食政策以解決增加中的肥胖及非傳染性慢性疾病率。這一套飲食指南是本地專家委員會，依審查科學性文獻及 2010 國民營養調查的現階段飲食模式數據而制定。使用本地食物成分資料庫(FOCOS) 計算 2011 飲食指南的每日飲食營養素可獲量並以營養素建議量驗證。因應不同年齡層間飲食需求的差異，發展不同的飲食指南，並依不同族群量身打造。迄今，新加坡已經制定兒童及青少年(著重在建立健康的長期生活飲食模式)、成人(著重在預防肥胖及加強健康的飲食模式)。最近，針對老年人(>50 歲)的指南，提出因年齡相關增加的營養素需求合併熱量需求降低所引起的潛在飲食不足議題。在新加坡，飲食指南已經使用在告知及直接的公眾政策去推廣飲食模式，以符合營養素需求，同時降低非傳染性慢性疾病的危險性。公眾政策的例子包含：食品廣告的全國性準則及護理之家的食物供應標準；公共衛生推廣計劃的例子包括：包裝食品的健康選擇標籤方案及在大排檔、餐廳及學校或工作場合食堂推動供應健康飲食。

**關鍵字：**飲食指南、新加坡、營養政策、公共衛生