

Original Article

New Chinese dietary guidelines: healthy eating patterns and food-based dietary recommendations

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Background and Objectives: The Chinese Dietary Guidelines (CDGs) were first released to the public in 1989 by the Chinese Nutrition Society (CNS). In 2016, the Ministry of Health commissioned the CNS to revise and publish new CDGs. **Methods and Study Design:** The CNS convened an expert committee of leaders in the fields of nutrition, epidemiology, public health, preventive medicine, and food science. The CDGs were revised according to the World Health Organization Handbook for Guideline Development procedures. The expert committee recommended key inclusions for the CDGs on the basis of the current status of public health and priority health challenges affecting the Chinese population, as well as the quality of scientific evidence. **Results:** The CDGs (2016) provide six key dietary recommendations for the general Chinese population aged 2 years and above. In addition to a newly revised Chinese Food Guide Pagoda, both the Chinese Food Guide Plate and Chinese Food Guide Abacus are newly created pictorial models in the CDGs (2016); the Chinese Food Guide Abacus is specifically designed for children. Seven additional dietary guidelines targeting specific populations are included; these guidelines emphasize the different physiological and nutritional requirements of particular populations, including dietary guidelines for vegetarians for the first time. **Conclusions:** The CDGs (2016) is an official document published by the National Health Commission of China. Its content highlights the current status of public health and offers advice to address health concerns faced by the Chinese population. The CDGs (2016) have been widely disseminated and accepted in the Chinese population; the National Nutrition Week is a major national event in which the CDG are used as its core to increase public awareness towards a healthy diet and lifestyle.

Key Words: China, dietary guidelines, healthy eating patterns, evidence-based nutrition, Chinese Food Guide Pagoda

INTRODUCTION

Dietary nutrition is the basic foundation of public health and reflects a population's both nutritional and chronic disease status. Public health is closely related to the sustainable development of a country; thus, the Chinese government pays considerable attention to the health challenges of the population. The first Chinese Dietary Guidelines (CDGs) were introduced in 1989, and further revisions were made in 1997 and 2007; these revisions were made to address and reflect the nutritional and health needs of the Chinese population.

The total gross domestic product (GDP) of China was US\$3,523 billion when the CDGs (2007) were issued. Since then, China's GDP has skyrocketed to exceed US\$10,000 billion in 2014.¹ The dietary patterns of the Chinese population have also drastically changed (Table 1) over this period. In rural households, the consumption of grains (per capita per year) decreased from 199.5 to 167.6 kg, whereas the consumption of meat and poultry increased by 56.1% and 112%, respectively; the consumption of edible oil also increased. These changes in dietary patterns were more evident in urban households during 2014: the consumption of grain was lower (117.2

vs 167.6 kg) and that of meat and poultry was higher (37.5 vs 29.2 kg) in urban households than in rural households.^{2,3} The nationwide consumption of salt in 2012 was 10.5 g per day, exceeding the recommended 6 g per day.⁴

These changes in Chinese dietary patterns have affected the population's health status. From 2002 to 2012, malnutrition in adults and stunting in children decreased from 8.5% and 6.3% to 6.0% and 3.2%, respectively.⁵ However, the prevalence of overweight and obesity in Chinese adults increased from 22.8% and 4.5% in 2002 to 30.1% and 9.6% in 2012 respectively.⁵ Moreover, chronic diseases, such as diabetes and cardiovascular diseases, appear to be increasing in China, and the relationship

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Table 1. Average annual consumption of various food types in Chinese rural and urban households (kg per capita) in 2007 and 2014

Food types	Rural household (kg per capita)		Urban household (kg per capita)
	2007	2014	2014
Grains	199.5	167.6	117.2
Fresh Vegetables	99.0	87.5	100.0
Poultry and meat (pork, beef and mutton)	18.7	29.2	37.5
Edible Oil	6.0	12.7	10.8

between diet and chronic diseases has been highlighted in many studies.

These outcomes emphasize the importance of revising dietary recommendations provided in the CDGs to be relevant to the current nutritional and health status of the Chinese population. The new CDGs are aimed at disseminating the best dietary guidances based on strong scientific evidence to prevent chronic diseases and maintain the health of the Chinese population.

METHODS

The Chinese Nutrition Society (CNS) was commissioned by the National Health Commission to further revise the CDGs to ensure the scientific quality and viability of the guidelines. The CNS set up an expert committee on CDGs and established a technical working group to organize and execute the revision of the CDGs.

Sources of information and data

- National Dietary and Nutrition Survey: Quantitative information concerning the food consumption and nutrient intake of the general population in China.
- Chinese DRIs (2013): Current reference values of macronutrients and micronutrients used to plan the nutrient intake of the healthy general population.
- Chinese Nutrition and Chronic Disease Report: Data concerning the current health quality and nutrition intake of the Chinese population.
- CDGs (2007).
- Scientific evidences: Scientific journal articles played a major role in the drafting of the CDGs (2016). Keywords were used to search and retrieve Chinese (from 1997 to June 2014) and English journal articles (2002 to June 2014) from the Internet.⁶ The evidence retrieved was further assessed and rated using the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) approach to categorize the quality of the evidence.⁷ Only high- and moderate-quality evidence, as assessed by GRADE, was used to develop the CDGs (2016).

The dietary recommendations aim to provide a “balanced dietary pattern.” The latest scientific evidence concerning the association of food with health was used as the basis for recommendations, and public health and dietary challenges faced by the Chinese population were addressed equally. Importantly, whole foods were used as the foundation of dietary recommendations in the CDGs, so that the recommendations can be easily practiced and be relevant to China’s overall health policy.

Revision process

Using the World Health Organization’s Handbook for

Guideline Development⁷ as a reference, the expert committee on CDGs drafted the following main revision process for the CDGs: (1) analyze and define the main dietary and health challenges of the Chinese population; (2) identify the latest evidence in the field of food, nutrients, and public health; (3) evaluate and analyze the CDGs (2007); (4) establish food-based dietary guidelines; (5) review, revise, and improve the guidelines; and (6) provide pictorial models of the guidelines.

RESULTS

A total of six technical reports were produced for the revision of the CDGs: (1) Procedures for the Revision of the CDGs, (2) Food and Health Evidence-Based Review, (3) Analysis Report on the Nutrition and Health Issues in the Chinese Population, (4) Consumer Report on the Survey about the Public’s General Knowledge on CDGs (2007), (5) Analysis Report on the Dietary Guidelines of Other Countries, and (6) pictorial models of the guidelines.

The dietary guidelines in the CDGs (2016) were established on the basis of scientific evidence, key nutritional and health issues of the Chinese population identified in the technical reports, the knowledge of the expert committee, and the relevant experiences of other countries concerning the revision of dietary guidelines. In addition, each recommendation was peer reviewed to ensure they are food-based and easily practiced.

A total of six key dietary recommendations were summarized in the CDGs (2016) for the general Chinese population aged more than 2 years. Dietary and lifestyle guidelines were provided for seven additional specific populations that have different physiological and nutritional requirements.

Dietary guidelines for the general population

The newly revised Dietary Guidelines for the General Population highlight six core recommendations, which form the main dietary guidance for the healthy Chinese population aged two years and above. The six core recommendations are accompanied with detailed explanations in the CDGs (2016); a summary of each recommendation is presented in the following sections.

Eat a variety of foods in a cereal-based diet

The CDGs recommend consuming a varied diet with an average of 12 different foods daily and at least 25 different foods weekly. A cereal-based diet is a diet where half of the calories are provided by cereals and tubers. A total daily intake of 250–400 g of cereals, tubers, and legumes is recommended, including 50–150 g of whole grains (including legumes) and 50–100 g of tubers daily.

A cereal-based and varied diet retains the features of a traditional Chinese diet, which is mainly cereal based. A varied diet can be easily achieved by swapping one food for another that belongs to the same food group from time to time. Ensuring that cereals are present at each meal, whether eating at home or out, helps achieve a cereal-based diet.

Be active to maintain a healthy body weight

Individuals of all ages are encouraged to engage in daily physical activities to maintain a healthy body weight. Adults should perform moderate physical activities (equivalent to 6000 walking steps daily) at least 5 days per week for a total of at least 150 min. Because of the increasingly sedentary nature of both work and home life, the CDGs also recommend avoiding being sedentary for more than 1 hour.

Eat plenty of vegetables, fruits, dairy products, and soybeans

The CDGs recommend eating 300–500 g of vegetables daily, half of which should be dark-colored vegetables. In addition, consuming 200–350 g of fresh fruit is recommended daily. The guidelines also recommend eating a wide variety of dairy products; 300 mL of milk daily should be the goal. Soy products, equivalent to 25 g of soybeans or more, are also recommended. Nuts can be eaten in moderation because they are a good source of unsaturated fatty acids. Various types of soy products, such as tofu, bean sprouts, and soymilk, are also available to help achieve the daily recommended intake of soybeans.

Eat moderate amounts of fish, poultry, eggs, and lean meat

A daily intake of 120–200 g of fish, poultry, eggs, and lean meat is recommended in the guidelines; particular quantities break down into 40–75 g of fish, 40–75 g of poultry and meat, and 40–50 g of eggs. Fish and poultry should be the preferred source of protein. Processed meats, such as smoked or cured meats, should be avoided. It is also recommended to eat 25 g of organ meat 2–3 times per month.

Cooking methods affect the nutritional content of meat; steaming or poaching retains more nutrients and results in less fat than frying. Eating meat used in soups also ensures that the protein source is not wasted.

Limit salt, cooking oil, added sugar, and alcohol

Table salt and cooking oil consumption for an adult should be limited to less than 6 g and 25–30 g per day, respectively. Trans-fat intake should also be limited to 2 g a day. The guidelines recommend eating less than 50 g, and if possible 25 g, of added sugars per day, and also encourage drinking a sufficient quantity of fluid (7–8 cups, 1600–1800 mL) daily. Children, adolescents, and pregnant and lactating women should refrain from drinking alcohol. Alcohol consumption for men and women should not exceed 25 g and 15 g, respectively.

Develop healthy eating habits and avoid food waste

Introducing food waste into the food supply chain should

be avoided. Everyone should be conscientious of avoiding waste at each stage from harvest and transport to the storage, preparation, and consumption of food. The guidelines recommend learning to read food labels to make healthy and informed food choices. Choosing fresh and clean foods and using appropriate cooking methods are critical to ensure food safety. Implementation of the guidelines can be promoted by each individual, family, school, and the whole society to develop a healthy eating culture and sustainable behaviors.

Supplementary guidelines for specific populations

These guidelines supplement the Dietary Guidelines for the General Population and are based on the different physiological characteristics and nutritional needs of different age groups and life stages within the Chinese population. Recommendations specific to various populations are highlighted below.

Women who are trying to get pregnant

- Adjust prepregnancy weight to a normal body weight
- Use iodized table salt and frequently consume iron-rich foods; in addition, take a folic acid supplement 3 months prior to pregnancy
- Refrain from smoking and drinking and maintain a healthy lifestyle

Pregnant women

- Take a folic acid supplement, regularly consume iron-rich foods, and select iodized table salt over normal salt
- Women with severe morning sickness should eat small and frequent meals throughout the day to ensure an adequate intake of carbohydrates
- Appropriately increase the intake of milk, fish, poultry, and lean meats during the second and third trimesters
- Perform physical activities in moderation and gain weight at an appropriate rate throughout pregnancy
- Refrain from smoking and drinking; maintain a positive mood during pregnancy and be prepared to breastfeed

Lactating women

- Increase consumption of animal-based foods and seafood that are rich in high-quality proteins and vitamin A; in addition, select iodized table salt over normal table salt
- Eat a variety of foods and nothing in excess; pay attention to nutrition during the lactation period
- A positive mood and sufficient sleep can promote breast milk secretion
- Continue breastfeeding and perform physical activities in moderation to help control body weight
- Refrain from smoking and drinking as well as the consumption of concentrated tea or coffee

Preschoolers (2–5 years old)

- Establish good eating habits and eat only at fixed meal times; parents should encourage self-feeding and discourage picky eating
- Drink milk daily and an adequate quantity of water; choose healthy snacks
- Foods should be properly prepared to promote easy digestion; seasoning and frying of foods should be lim-

Table 2. Quantity of recommended food[†]

Food types	Recommended intake (g)
Cereals, tubers and legumes	250–400
Whole grains and legumes	50–150
Tubers	50–100
Fruits	200–350
Vegetables	300–500
Lean meats	40–75
Fish	40–75
Eggs	40–50
Soybeans and nuts	25–35
Milk and dairy products	300
Cooking oil	25–30
Salt	<6
Water	1500–1700 mL

[†]Based on an average adult who requires daily energy intake of 1400–2600 kcal.

ited

- Encourage children to prepare and cook foods to promote their interest in foods
- Encourage outdoor activities to aid healthy growth

Children and adolescents (6–17 years old)

- Understand different foods, learn how to prepare meals, and improve nutritional knowledge
- Have three meals at fixed meal times and establish healthy eating habits
- Choose healthy snacks, drink adequate quantities of water, and avoid beverages with added sugar
- Encourage a balanced diet, avoid picky eating and over-eating, and maintain a healthy rate of weight gain
- Encourage outdoor activities for at least 60 min daily

The elderly population (65 years old and above)

- Frequently eat small meal portions daily, and consume softer foods to prevent nutritional deficiency
- Stay hydrated by drinking adequate quantities of water
- Engage in outdoor activities
- Delay sarcopenia by maintaining an appropriate body weight
- Ensure adequate food intake; eating meals with others is encouraged

Dietary guidelines for vegetarians

- Eat a variety of cereal-based foods
- Increase intake of soybeans and soy products to 50–80 g daily; choose fermented soy products
- Eat nuts, seaweed, and fungi regularly
- Eat plenty of fruits and vegetables
- Choose healthy cooking oils

Pictorial models of a balanced dietary pattern

The Chinese Food Guide Pagoda (CFG-Pagoda), Chinese Food Guide Plate (CFG-Plate), and Chinese Food Guide Abacus (CFG-Abacus) are pictorial food models designed to help illustrate both the variety and proportions of foods necessary for a healthy diet.

The CFG-Pagoda is the central visual representation of an ideal balanced diet for an average adult (Figure 1A) and aids in the selection of food groups required for a

balanced diet. A runner and a glass of water are showed next to the CFG-Pagoda, highlighting the importance of exercise and sufficient water intake. The quantity of food recommended is calculated for an average adult who requires 1400–2600 kcal per day (Table 2).

The CFG-Plate and CFG-Abacus are new figures introduced in the CDGs (2016). They were designed to be supplemental figures to the CFG-Pagoda (Figure 1B and 1C). The CFG-Plate illustrates the food proportions of a balanced diet for one single meal. The CFG-Abacus was designed for children aged 8–12 years. The depiction of the abacus in the CFG-Abacus and the different color beads attract the interest of children to learn recommended food portions and aid their memory.

DISCUSSION

Compared with the previous CDGs, major changes and improvements made in the CDGs (2016) are as follows:

Emphasis on dietary patterns

Dietary patterns are a broad picture of food as well as nutrient consumption, and thus can be a predictor in risks of disease than individual food or nutrient alone.⁸ Nationality, economic class, religion and social norms can dictate the dietary pattern of an individual. It is essential that the dietary recommendations as suggested in CDG (2016) to include detailed explanations on how to follow the balanced dietary pattern recommended as well as how to incorporate different or more appropriate foods.

As China's rapid urbanization spurred major shifts in the dietary structure,⁹ labor intensity, and physical activity of the population, one of the main changes in the dietary recommendations of the CDGs (2016) is the amount of food recommended; this change is also attributable to the revision of estimated energy requirements in the latest Chinese DRIs. The CDGs (2016) recommend increasing the whole grain intake because of the high consumption of refined flour. Eating soybean and soy products is encouraged as an alternative to eating meat because they are commonly consumed in the Chinese diet.

Emphasis on quantitative guidance

For the first time, the CDGs (2016) include clear descript-

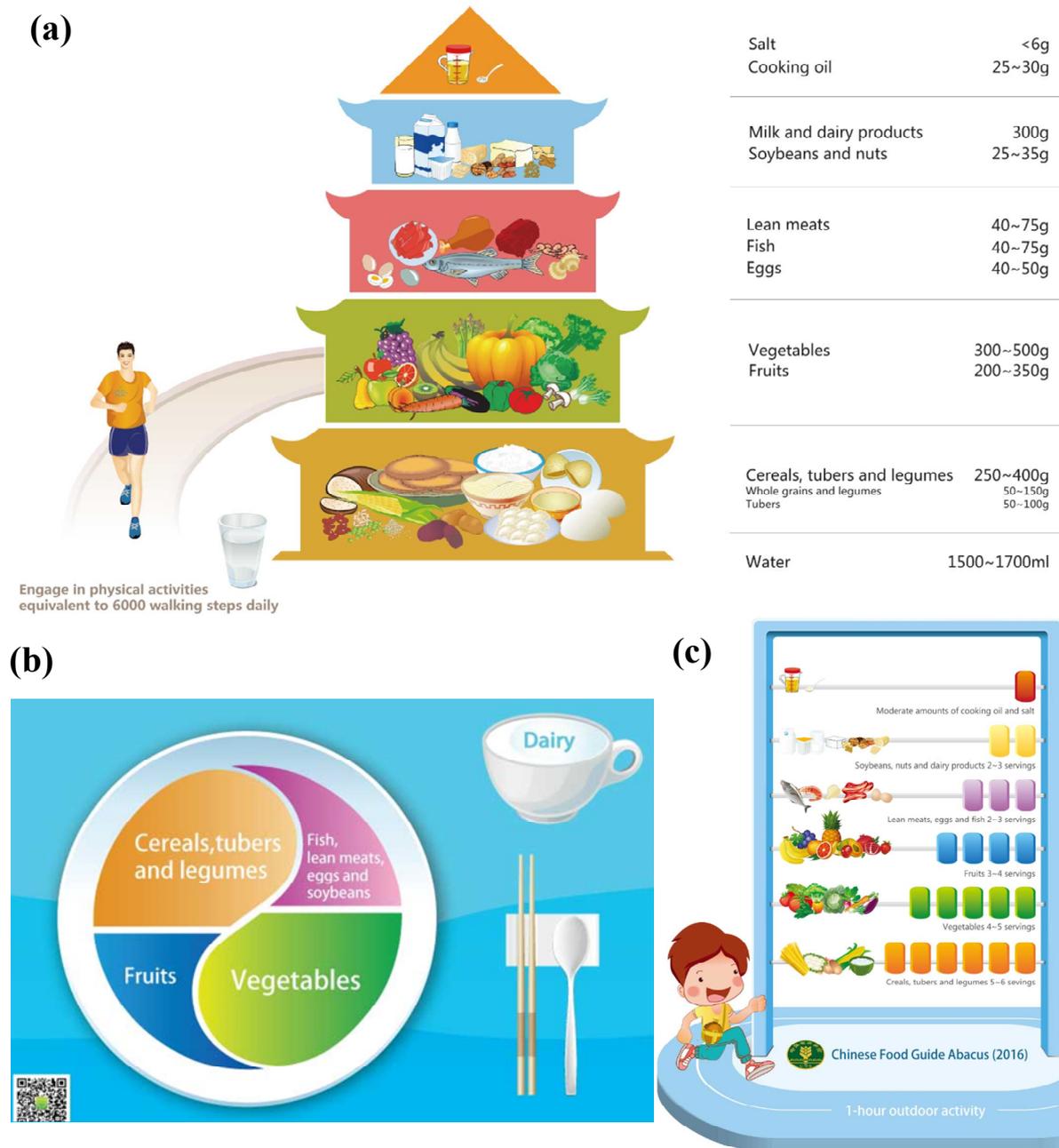


Figure 1. Illustrations for the CDGs (2016): (a) CFG-Pagoda is the main graphical illustration; (b) CFG-Plate and (c) CFG-Abacus function as supplementary illustrations for CFG-Pagoda.

tions of recommended portion sizes. Clearly defined portion sizes enable readers to understand and visualize the amount of food recommended; thus, facilitating the practice of eating a balanced diet. The recommended quantities of various food groups are clearly defined in the table shown adjacent to the CFG-Pagoda.

The CDGs (2016) recommend that whole grains should make up one third (50-150 g) of the total amount of cereals eaten. Also, it is a first for CDG (2016) to provide a dynamic chart for the energy requirement for individuals across all age groups. Daily physical activities should adequately account for 15% to 30% of an individual’s total energy expenditure; this is equivalent to 6000 walking steps of physical activity.

Emphasis on cultivating healthy eating habits

The CDGs (2016) also include “cultivating a healthy eat-

ing habit” as one of its core recommendations for the first time. A healthy eating behavior can be sustainable only when the established dietary recommendations align with a family’s lifestyle and Chinese culture. Food waste is a problem of considerable magnitude in China;¹¹ thus, reducing food waste is a critical objective. Food waste can be avoided throughout the food supply chain, but cooking meals at home and serving individual portions can help reduce food waste at the consumer level, promote healthy eating habits, and encourage development of a healthy lifestyle. The role of the family in cultivating good dietary habits in children is also highlighted in the CDGs (2016).

Pictorial models of the dietary guidelines

In addition to the revised CFG-Pagoda, the CFG-Plate and CFG-Abacus are new additions to the CDGs (2016).

Both CFG-Plate and CFG-Abacus incorporate symbols of Chinese culture and function as supporting figures for the CFG-Pagoda.

The CFG-Plate illustrates the necessary portions of various food groups for an average adult in a single meal. It was designed to reflect the “Tai-Chi” diagram, its ancient philosophy represents duality (*yin-yang*) and balance. This evokes the importance of diet and exercise for a healthy lifestyle.

The CFG-Abacus was specifically designed for those aged 6–12 years. The abacus was used as an ancient calculating device in China. Visually depicting the various recommended food portions as simple quantities of abacus beads enables children to understand and remember the healthier recommended food portions. Both the “Tai-Chi” diagram and abacus are widely known objects; their philosophy and function are also eminent in the Chinese population. CFG-Plate and CFG-Abacus function as supporting figures of the CFG-Pagoda and help improve the understanding and practice of a balanced dietary habit as encouraged in the CDGs (2016). The amounts of food suggested in the CFG-Pagoda refer to the uncooked raw weight of foods.

Conclusions

The CDGs (2016) were officially launched in May 2016 by the National Health Commission of China. Two versions of the CDGs (2016) were published: one for professionals and policy makers and one for the public; the version launched for the public is a simplified version for easy understanding and implementation. The CDGs (2016) is the joint effort of many experts and based on the latest and best scientific evidence. Taking the current dietary and health challenges of the Chinese population into account, the dietary guidelines present a practical way for the Chinese population to achieve a balanced dietary pattern. The new addition of content, such as meal plans, detailed portion sizes, and visual illustrations, also make the dietary guidelines easy to read, understand, accept, and practice.

Apart from being a scientifically reliable guide for the public, the CDGs (2016) are used as the foundation and reference for establishing nutritional and health policies in China.

Limitations

Only evidence from 1997–2014 for Chinese journals and 2002–2104 for English journals was included in the evidence assessment. Evidence outside these time periods, regardless of their scientific value, was excluded. In addition, the established dietary recommendations are only applicable to the healthy population.

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AUTHOR DISCLOSURES

All authors are members of the Chinese Nutrition Society.

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