Review Article

From dietary guidelines to daily food guide: the Taiwanese experience

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In early 1980's, the first edition of dietary guidelines for Taiwanese was established by the Department of Health (DOH), Executive Yuan. The main purposes of the guidelines were to guide nutritional professionals and dieticians to plan diet for preventing general population from diseases. Besides the amount of daily cholesterol intake, the percentages of calories from carbohydrate, protein, and fat was recommended. Dietary guidelines were revised concurrently as the results of national nutrition survey showed dietary or nutrient deficits of Taiwanese population. The recent dietary guidelines were then revised for general publics and consist of 8 items, including: maintain ideal body weight, eat well-balanced meals from all food groups, eat whole grains as staples for main meals, eat more high-fiber foods, eat less fat, less salt, and less sugar, consume plenty of high calcium content foods, drink plenty of water, if you drink alcohol, do so in moderation. In addition to these qualitative guidelines, a daily food guide was also established to instruct the general public to consume portions from six food groups. The suggested portions for food groups were calculated and based on basic balanced meal principles and the recommended energy, protein for different age groups from DRIs. The pictorial representation of the daily food guide was plum blossom which is the national flower. Leaflets, posters, and slides were developed for nutrition education. As the eating behavior and disease patterns may change, the governments and nutrition societies should keep revising dietary guidelines and daily food guides to encourage population health.

Key Words: dietary guidelines, daily food guides, dietary guidance, food groups

INTRODUCTION

In order to improve the nutritional status of the Taiwanese population after the Sino-Japanese War, the Taiwan Provincial Department of Agriculture and the Joint Commission on Rural Reconstruction (JCRR), an organization created according to an economic agreement signed with the US to rebuild rural areas and revive agriculture, conducted a series of home economics extension programs to teach rural housewives how to select and cook foods. Similar to the Basic Four in the US, foods were categorized as protein foods, grains and root vegetables, vegetable and fruit groups, in the 1950s and '60s. Home economics extension workers encouraged rural housewives to select at least one food from each of four food groups for meal planning and taught them the best food selections from each food group. This Basic Four food grouping served as the basis for government to plan daily food guides.

During the same time period, the central government also recognized a need for setting nutrient requirements for individuals to plan food production for the nation and to assess food intakes for institutionalized persons. Based on the nutritional status and the weights of different age groups of Taiwanese at the time, and with reference to the recommendations of other countries, Recommended Daily Nutrients Allowances (RDNA) was established in 1972. In 1979, 1986, 1993, RDNA were amended in accordance with the contempary nutrition science, population nutritional status, eating behaviours, and food availability among Taiwanese. RDNA was changed to Dietary Reference Intakes (DRIs) in 2003 which not only included the original RDNA, but also acknowledges adequate intakes and tolerable upper intake levels.

HEALTH AND NUTRITIONAL STATUS CHANGE IN TAIWANESE

Improvements in health care and other measures progressively prolonged the life expectancy of the population. The population aged 65 and over reached 7% in 1993, making Taiwan an aged society by WHO criteria.[1] The life expectancy for females at birth was 79.8, and 73.9 for males in 2005.[2] Instead of communicable diseases, non-communicable diseases, such as malignant neoplasms, cerebrovascular disease, heart disease, diabetes mellitus, and injury were the top five leading causes of death in 2005.[2]

The big economic leap in Taiwan during 1960s and '70s caused great changes in food availability, eating behaviours and life styles among Taiwanese. Clinical micronutrient deficiencies among children, such as angular stomatitis, cheilosis, follicular hyperkeratosis, and bleeding gum

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Manuscript received 9 September 2007. Accepted 3 December 2007.

diminished during this period.[3,4] Average daily rice intakes decreased, while wheat flour consumption increased. However, total grains intakes reduced.[5, 6] With an abundant food supply, the average daily intakes of vegetables, fruits, fish, meat, poultry, eggs, and milk increased. The increases in meat intake and decreases in rice consumption, gave rise to a more so-called westernized eating pattern during this period.

With the higher meat intake, daily fat and cholesterol and protein intakes increased.[5, 6] There was a change from lard to soybean oil for cooking which caused the P/S ratio of Taiwanese to increase from 0.48 in 1975 to 0.73-0.93 in 1996.[6,7] In regard to micronutrient intakes, vitamin B_2 and calcium intakes of Taiwanese population were the two deficient nutrients in a series of national nutrition surveys.[6, 8, 9] As the population's energy intake increased and physical activity decreased, the prevalence of obesity of primary school children increased from 0% in 1954 to 12% in 2002.[3,10] The obesity prevalence rate of adult males and females were 14.6% and 15.8%.[11]

NEED FOR DIETARY GUIDANCE

Food guidance for Taiwanese is provided by DRIs, dietary guidelines, and daily food guides. The main purpose of food guidance is to improve the health and nutritional status of the population through diet. Dietary guidance is used not only by government to establish food and agricultural policies, but also to provide criteria for implementing and evaluating nutrition intervention programs. Dietary guidelines and daily food guides themselves can be communication tools and educational materials to promote healthy eating patterns.

Originally, DRIs were recommendations about energy and nutrients for policy making or other professional uses. They are not easily understood by the public. Dietary guidelines should serve as guidance for professionals or the public. The quantitative elements of dietary guidelines, such as the recommended energy percentages from macronutrients, which could be used for meal planning, were intended for professional use. The qualitative elements of dietary guidelines, mainly eating behaviour recommendations, were meant for people-at-large. Daily food guides are quantitative food recommendations about different food groups based on balanced nutrition. Different servings by food group are recommended for different age groups.

THE PROCESS OF DEVELOPING DIETARY GUIDELINES

The Department of Health, Executive Yuan, organized several meetings with nutritionists from universities and food personnel from the Agriculture Council to formulate the initial dietary guidelines and the daily food guides for Taiwanese. The first edition of Dietary guideline for Taiwanese was released in 1984 (table 1).

The objective of the first edition of dietary guidelines was to establish principles for good eating habits for adults to prevent chronic disease. The first dietary guidelines were really dietary goals. The percentage energy intakes from macronutrients, the P/M/S ratio, daily salt and cholesterol intakes were recommended and used mainly by nutrition professionals. The goals presented in the first edition are still relevant in practice and are frequently used in meal planning, diet quality evaluation, and by government to set food and nutrition policies.

The second and third editions of dietary guidelines were intended to make qualitative recommendations for the public (table 1). The social aspects of the recommendations were removed in the third edition. The concept of using body mass index (BMI) to evaluate ideal body weight was introduced in the third edition to replace standard body weight measured by a regression equation derived from the first national nutrition survey. The observation of excessive consumption of sugary drinks, especially among children and adolescents, resulted in the recommendation to drink plenty of water for daily liquid requirements. Since low calcium intake is regarded as a national nutrition problem, the consumption of high calcium foods was recommended in the third edition.

THE PROCESS OF DEVELOPING DAILY FOOD GUIDES

Food groups

Although oil and fat are not necessarily visible when one

Table 1. Dietary Guidelines for Taiwanese in 1984, 1992, 1995

Taiwanese dietary guidelines 1984	Taiwanese dietary guidelines 1992	Taiwanese dietary guidelines 1995
● To establish principles of good eating habits for adults to prevent chronic disease	● Maintain standard body weight	● Maintain ideal body weight
● Balance energy input and output to prevent obesity	● Consume a variety of fresh foods	● Eat well-balanced meals from all food groups
● 12% of caloric intake from protein	● Eat more grain and root vegetables	● Eat grains as staple foods for main meals
● 25% of caloric intake from fat, S:M:P=1:1:1	● Eat more high-fiber foods	● Eat more high-fiber foods
● 63% of caloric intake from carbohydrate, less than 10% of caloric intake from pure sugar	● Avoid excessive consumption of alcohol	● If you drink alcohol, do so in moderation
● Given good quality protein consumption, consume less than 400 mg cholesterol daily	● Avoid excess consumption of salt or sodium, eat less salty or excessively seasoned foods	● Eat less fat, salt, and sugar
● 8-10 g salt equivalent daily, including salt, soy sauce, salty preserved foods	● Avoid excess consumption of high fat or high cholesterol foods	● Drink plenty of water
	● Eat meals with family at home	● Consume plenty of high calcium content foods

Figure 1. Daily Food Guide for Taiwanese in 1975, 1977, 1980, 1995

eats a meal, their contribution to energy, fat and other nutrients can not be neglected, especially for a population which uses stir fried dishes frequently. For this reason, an oil and fat group was added to the original basic four food groups for a daily food guide. The names of food groups were altered for easy recognition and memorization. The **five food groups** are (1) one with meat, fish, soy bean, egg, and milk (referred to as a meat group), (2) a grain and root vegetable group, (3) an oil and fat group, (4) a vegetable group, (5) a fruit group. Plum flower, the national flower which has five petals, was used as a logo for balanced nutrition from the five food groups (fig. 1). In order to encourage the intakes of two nutrients with deficit potential, vitamin B_2 and calcium, milk and dairy was made a separate group in the daily food guides edition of 1995. However, the logo of plum blossom was kept, so the population had not to re-familiarize itself with a new logo in addition to a new food group. The grain and root vegetable group was put in the central part of the logo to emphasize the importance of this particular food group.

Portion unit and size

For communication and education purpose, the food portion units in different food groups should be those which are commonly used and familiar. At the same time, exchanges are based on nutritive values characteristic of the same group. The portion units are 'exchange', 'bowl', 'table spoon', 'dishes', 'piece' and 'cup' for meat, grain, oil, vegetable, fruit, and milk groups respectively. The portion size of each unit is described in the daily food guides. One exchange of 'meat' equals about 30 g meat itself, 100g of tofu, 240 ml of soy bean milk, or one egg. The weight of one bowl of rice or one dish of vegetable is 200 g or 100 g respectively. One piece of fruit is approximately a 100 g orange. A table spoon of oil or fat is 15g, and one cup of milk is 240 ml.

Number of portions

In the Daily Food Guides of 1977, the slogan '12345' was used to create population familiarity with the guide. '12345' meant one piece of fruit, 2 table spoons of oil, 3 dishes of vegetables, 4 bowls of rice, and 5 exchanges of meat. However, the nutrient content of this easily memorisable slogan could not provide the nutrient recommendations for adults by way of this number of food group portions and given the population's food preparation methods. For example, two table spoons of oil were not enough to prepare one day of Chinese meals for a person at that time. Also 4 bowls of rice was generally too much for a female with light activity. One piece of fruit was not enough to provide adequate micronutrient requirements. The numbers of portions of meat and vegetable groups, were unchanged and those for grain, oil, and fruit groups were changed to 3-6 bowls, 3 table spoons, and 2 pieces respectively in the 1980 edition. The recommended numbers of portions from five food groups could then provide 2000 to 2800 kcal of energy and 56-88 g of protein for adults. Whilst one exchange was subtracted from the meat group, one to two cups of milk per day was recommended in the 1995 edition. Since different amounts of energy and nutrients are required by different age groups and in various physiological states, recommendations for different ages were added in 2003.[12]

PROMOTION AND IMPLEMENTATION

Dietary guidelines and daily food guides can serve as key nutrition education tools for the public and help establish healthy eating habits to prevent nutritionally-related disease. Various products like pamphlets, posters, booklets, handouts, slides and transparencies are produced for local health agencies, home economics extension agencies, schools, universities, hospitals, food stores, restaurants, non-government organizations and related public bodies. Posters on city buses draw attention from passengers and passer-by. Newspaper, radio and TV programs disseminate the recommendations too. Daily food guides are incorporated in to school curricula so that a younger generation may establish healthy eating habits for life.

Public food service programs are an efficient way to demonstrate dietary guidance. Meal planning for school lunch programs is another example. Dieticians apply them in counselling patients and, hopefully, in their own daily life as role models.[13] They are used as assessment tools to evaluate diet quality in nutrition surveys. National nutrition policies are amended based on the basis of data so –derived.

FUTURE APPROACHES

Review of the process of development and implementation of dietary guidelines and daily food guides for Taiwanese identifies several future possibilities. One would be to have regular and proactive review of the evidence which must underpin recommendations-what is now referred to as Evidence-Based Nutrition (EBN), as a

matter of government policy. There should be an identified government agency responsible for periodical review and implementation of nutrition policy and recommendations about healthful diets. There is value in a food system approach to nutrition policy which is multidisciplinary involving nutritionists, food professionals, food industry, nutrition educators, dieticians, and media experts. Acceptability and comprehension of dietary guidance before dissemination is essential.

Physical activity is intrinsic to dietary guidelines and can be both incorporated into it and developed separately.[14,15] This is more so as obesity becomes a more important health issue in Taiwan. Physical activity should be included in the next edition of dietary guidelines for Taiwanese.

All packaged foods sold in Taiwan will be required to have nutrition information panels by January 1, 2008. The connection of dietary guidance and nutrition labelling will increase the awareness of dietary recommendations.

Evaluation of the effectiveness of nutritional programs is often lacking and constitutes an important part of EBN, that to do with policy.

Cross-country collaboration may provide stimulus and efficiencies for the collection of nutritional evidence, thus give the individual county more time to elaborate dietary recommendations based on its own cultural aspects. It has been more than 5 years that Taiwanese government has not thoroughly reviewed dietary guidelines and daily food guides. During this time period, new DRIs were also established and new data from the results of national nutrition surveys. Thus, it is about time to call for revision of dietary guidelines and daily food guide for Taiwanese.

AUTHOR DISCLOSURES

Min Su Tzeng, no conflicts of interest.

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