

UNIT 15: DIETARY STANDARDS AND TABLES OF FOOD COMPOSITION

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1.0 Introduction

Some previous units discussed the roles of essential nutrients: carbohydrates, protein, fats and oil, minerals and vitamins. Some other previous units discuss the classes of food such as cereals, fruits and vegetables, meat and meat products, eggs and egg products, milk and milk products. Diets are made from these foods. The diet must be adequate in the supply of nutrients required by individual for energy and for other metabolic processes.

In view of this, there is need to have recommended dietary allowances for individual with consideration of age, sex, and body weight and size and types of occupation etc. There is also a need to know the nutrients composition of various foods so as to be able to make recommendations for dietary standards when the foods are consumed.

This unit therefore treats recommended dietary allowance and tables of food compositions.

2.0 Objectives

At the end of this unit, you should be able to:

- Discuss the need for dietary standards
- List the criteria for the establishment of dietary standards
- Interpret value of some recommended daily dietary allowance
- List the uses of dietary standards
- List the limitations of dietary standards
- Discuss the derivation of tables of food composition
- List the uses of tables of food composition
- List the limitation of tables of food composition

30 Main Content

3.1 Dietary Standards

The average food intake of individual family or groups of people over a period of time is called "diet". The diet can be balanced or it may not be balanced. A balance diet is quantitatively or qualitatively adequate in terms of the supply of nutrients for energy needs, growth, maintenance of body tissue and for the body metabolic functions. Therefore, a balanced diet contains the nutrients required in the correct proportions for the body to perform its functions.

The daily nutrients and energy requirements of individuals vary with age, sex, body weight and size and occupation. Illnesses and defectiveness of the body to digest nutrients can also affect the daily requirement of nutrient of an individual. Depending on the quantity and quality of the diet of an individual, there can be over-nutrition and under-nutrition. These two situations are not good for the individuals. To solve the problems created by these two situations, there is a need for the recommended dietary allowances (RDA).

3.1.1 Needs for Dietary Standards

The recommended dietary allowance (RDA) is necessary because:

- a. They provide a useful guide for nutritionists, dietitians and agricultural experts to plan and evaluate the diets of population groups.
- b. To decide on food production, agricultural policies and programmes

- c. To solve the problems of over-nutrition and under-nutrition resulting from ignorance in intakes of nutrients.

3.1.2 Establishment of Dietary Standards

In view of the needs identified in Section 3.1.1 of this unit, some countries notably United States of America, Britain and Canada have made recommendations for the recommended daily allowances (RDA). Agriculture Organization (FAO) and World Health Organization (WHO) along with others have developed recommended dietary allowances tables.

The tables show the daily nutrients requirement of different classes of people in a given population. These allowances are different from one country to another because of the differences in the population of the people that live in different climatic and environmental conditions and with different dietary practices. Also the different maker of the standards did not have the same interpretations to scientific data

In United States of America, the allowances are numerical quantities of certain nutrients that were made in such a way that they will meet the nutritional needs of practically all healthy persons in the country.

Consideration was made for differences in nutritional requirement for different ages and sizes. The allowances are more than those required by average persons but were set sufficiently high to cover the needs that will maintain good nutrition in practically all healthy persons in United States. Allowances were also made for losses in nutrients during cooking. There is allowance also to cover wide range of requirements for the population and to provide a buffer for conditions of stress. In establishing the standards considerations were given to

- a. Stability of nutrients
- b. The body ability to store the nutrients
- c. The range of observed requirement
- d. The availability of nutrient in America diet
- e. The possible hazard from an excessive intake
- f. Difficulties involved in establishing precise requirement.

(Guthrie, 1979)

The British Medical Association in setting the British dietary standards gave the dietary standards for the average healthy individual. Since these levels were never intended to cover the need of all persons, the British standards tend to be lower than American standards although they could be the same in some cases.

- a. They are used to plan and procure food supplies for population groups
- b. They are widely accepted as bases for evaluating diets
- c. They are used as bases for formulating regulations governing the composition of food, dietary supplements and nutrients labeling
- d. They are used for planning diet for institutions, schools, prisons and armed forces
- e. They help to interpret food consumption data in relation to the assessment of nutritional status
- f. They are useful in establishing nutritional guidelines for health and for other programmes
- g. The development of dietary standards leads to new product development in food industry
- h. They are useful in developing nutrition education programs

3.1.5 Limitation of the Dietary Standards

Some of the limitations of the dietary standards are

- a. They do not give consideration to conditions of illness, metabolic disorders and chronic diseases
- b. They do not consider those who use some drugs for some clinical reasons
- c. The guidelines are not adequate enough to ensure adequate daily intake of essential nutrients

Student Assessment Exercise 15.1

Discuss the needs for and the uses of dietary standards

3.2 Tables of Food Composition

This is the table that gives the amount of energy and nutrients in 100 grams of the edible portion of a food. The determination of this amount may be raw food material or cooked and ready for table portions of food dishes. The unit of energy used is kcal. The unit for carbohydrate, protein, fat and oil is gram. For the other nutrients such as vitamins or minerals, microgram or milligrams are used.

Most of the data used for compilation of food composition table were obtained from the results of published and unpublished analyses made by laboratories of Government Agencies, Institutions and Industries. Considerations were also given to varietal, seasonal and geographical differences in the nutrients content of foods and loss or gain of nutrients during processing. The table also contains those nutrients for which data were available for a sufficient number of foods.

Tables of food compositions have been published for many years and the differences between the values of some nutrients in the different editions of tables of food composition. These differences in the values for the same foods may be a product of changes in processing techniques and improved analytical techniques.

3.2.1 Derivation of Tables of Food Composition

Highly developed analytical methods are used to obtain the values of the nutrients. For instance, the energy in a food item is determined by knowing the weights of carbohydrate, protein and fat and oil in the food and by multiplying these weights by their respective coefficients of digestibility to obtain the available amount of nutrients. For carbohydrate, protein and fat respectively, we multiply the available amount by Atwater Factors of 4, 4 and 9 to obtain the energy contents of the nutrients. For protein, we obtain the nitrogen contents and multiply it by 6.24 to obtain the protein content. However, if it is milk we use a factor of 6.38, refined flour 5.7, whole wheat flour 5.8 and nuts, 5.3.

For fat content, we use simple solvent extraction method.

For carbohydrate content, we subtract the weight of water, protein, fats and oil and mineral from the total weight of the food to obtain the weight of carbohydrate. For all other nutrients vitamins and minerals, highly developed analytical methods are used.

3.2.2 Some Values of Tables of Food Composition

For you to appreciate the way table of food composition is presented and the contents of the table, a sample of table of food composition is presented in Appendix E

3.2.3 Uses of Tables of Food Composition

- a. The table of food composition allows the estimate of the nutritive content of diet to be made quickly at low cost
- b. Tables of food composition are indispensable tools for programs for food planning and distribution for evaluating food consumption surveys and for estimating the nutritive intake of individuals
- c. Since the information can be readily obtained from computers, they can be used for menu planning, analysis of dietary intake and as basis for nutritional counseling.

3.2.4 Limitation of Tables of Food Composition

Some of the limitations of food composition tables are

- a. There exists variations in the amount and specificity of data available for different foods and different nutrients
- b. Some products are inadequately described as regards their sources and methods of processing. Hence, some of the data that are useful from these types of nutrients can not be included in the tables of food composition.

3.3 Food Guide Table

The food guide table refers to the amount of food recommended per serving of a particular food item to ensure adequate supply of nutrients recommended by the RDA for maintenance of good health. The amount of food is given in grams and the number of servings of the food for different foods is also given. The food guide is to assist families in selecting an adequate diet.

The food guide is different from the food composition table in the sense that food composition table gives different amount of the nutrients in the foods. The food guide gives the amount of food per serving and the number of servings to meet the RDA requirements.

Table 15.3: Composition of United States Food Guide 1016, 1943 and 1956

Five Food Groups 1916	Basic Seven 1943*	Basic Four 1956*
Milk, Meat, Fish Poultry egg and Meat substitutes	Milk and milk products (2) Meat, Fish etc (2), Eggs (4 per week)	Milk and milk products (2), Meat, Fish, Poultry eggs (2)
Vegetables and Fruits	Green and yellow vegetables (1) citrus fruits and raw cabbage (1), Potatoes, other fruits and vegetables (2)	Fruits and Vegetables (4)
Bread and other Cereal Food	Bread, Flour, Cereal enriched or Whole Grain (3)	Bread, Flour, Cereal (enriched or Whole Grain) (4)
Butter and Wholesome Fat	Equivalent of 2 tablespoons butter or fortified margarine	
Simple Sugars		

* Number of Servings per day in Parentheses

Source: Guthrie H. A 1979. Introductory Nutrition 4th edition,
The C.V Mosby Company, St. Louis London. Pg 352

Student Assessment Exercise 15.2

Discuss food guide and differences between Pod guide table and Pod composition table

4.0 Conclusion

This unit discusses recommended dietary allowances (RDA), table composition and food guide table. The unit also discusses the uses and limitations of dietary standard, food composition table and food guide. Exercises are provided to make the student assess their understanding of the content of the unit.

5.0 Summary

The unit discusses dietary standards, table of food composition and food guides. The needs for dietary standards arise from the fact that dietary standards provide useful guide for nutritionists and Dietitians to plan and evaluate diets of population groups, to decide on food production, agricultural policies and nutrition programs and to solve the problems of over nutrition and under nutrition.

The dietary standards contain the amount of energy and the nutrients that are required for individuals at different ages with different sexes, body weights and occupation activities.

Values of recommended dietary allowances vary from one country to another especially in United States, United Kingdom and Canada from where we have RDA because of the differences in the bases for the compilation of their RDA.

Despite some limitations of the RDA, they are useful in planning and procurement of food supply for population groups, as basis for evaluating diet; as basis for formulating regulations governing composition of food, dietary supplement and nutrient labeling; for planning diet for institutions for establishing nutritional guideline; for health and other program.

Food composition table gives the amount of nutrients and energy in 100 grams of edible portion of a food. The table is compiled from the results of chemical analysis of the nutrients in the foods.

Food composition table is useful in the sense that it enables the nutritive content of a diet to be made quickly at a low cost. It is used to evaluate national food supply for developing programs for food planning and distribution. It is also used for menu planning, analysis for dietary intake and basis for nutritional counseling.

Food guide table consists of the amount of food recommended per serving of a particular food item to ensure adequate supply of nutrients recommended by RDA for maintenance of good health. While food guide gives the amount of food per serving and the number of serving and the serving to meet the RDA requirement, food composition table gives the amount of nutrients in the food.

6.0 Tutor Marked Assignment

Discuss the uses and limitations of dietary standards.

Answer to Student Assessment Exercises

15.1 See answers in Sections 3.1.1 and 3.1.4 of this unit

15.2 See answers in Sections 15.3 of this unit

7.0 References and Other Sources

Davidson S. et al (1975) Human Nutrition and Dietetics. Sixth edition
Longman Group Ltd.

Guthrie H. A (1979) Introductory Nutrition 4th edition,
The C. V. Mosby Company St. Louis London, Toronto