

Definitions

Nutrition the study of how food nourishes the body

Food any substance the body can take in and assimilate; a source of nutrients

Diet the food and beverages a person usually eats and drinks

Genome the full complement of genetic material in the chromosomes of a cell

DNA the molecule that encodes genetic information in its structure

Nutritional genomics the science of how nutrients affect the activity of genes and how genes affect the activity of nutrients

Energy the capacity to do work; energy that fuels the body comes indirectly from the sun via plants; measured in Calories

Nutrients components of food required for the body's functioning; roles include providing energy, building material, maintenance and repair, and supporting growth; ie: water, carbs, fat, protein, vitamins, minerals

Essential nutrients nutrients that the body cannot make or cannot make fast enough, from other raw materials

Definitions (cont)

Calories unit of energy; amount of heat energy needed to raise the temperature of 1 kilogram of water

Gram unit of mass; food and nutrients are often measured in grams

Elemental Diet composed of purified ingredients of known chemical composition; intended to supply all essential nutrients to people who cannot eat foods; *they are not superior to real food, dont enable people to thrive over long periods, dont support optimal growth and health, can cause medical complications*

Nonnutrients compounds other than the six nutrients present in food that have biological activity in the body

Phytochemicals nonnutrient compounds that confer colour, taste, and other characteristics on foods

Adequacy the dietary characteristic of providing all of the essential nutrients, fibre, and energy in sufficient amounts to maintain health and body weight

Definitions (cont)

Balance the dietary characteristic of providing foods of a number of different types in proportion to each other, such that foods rich in some nutrients do not replace foods that are rich in other nutrients

Calorie control control of energy intake

Moderation the dietary characteristic of providing constituents within set limits; nothing in excess

Variety the dietary characteristic of providing a wide selection of foods

Cuisines styles of cooking

Foodways sum of a culture's habits, customs, beliefs, and preferences concerning food

Ethnic foods associated with a particular cultural subgroup within a population

Nutritional assessment includes an individual's health and diet history, anthropometric measurements, laboratory test data

Registered dietitian indicates a qualified nutrition expert

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By **vweiss**

cheatography.com/vweiss/

Not published yet.

Last updated 15th October, 2022.

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Glossary of Food Types

- basic foods** milk and milk products; meats and similar foods, such as fish and poultry, vegetables, including dried beans and peas; fruits, and grains. These foods are generally considered to form the basis of a nutritious diet. Also called whole foods.
- enriched foods and fortified foods** foods to which nutrients have been added. If the starting material is a whole, basic food such as milk or whole grain, the result may be highly nutritious. If the starting material is a concentrated form of sugar or fat, the result may be less nutritious.
- fast foods** restaurant foods that are available within minutes after customers order them—traditionally, hamburgers, french fries, and milkshakes, more recently, salads and other vegetable dishes as well. These foods may or may not meet people's nutrient needs, depending on the selections made and on the energy allowances and nutrient needs of the eaters.
- functional foods** a term that reflects an attempt to define as a group the foods known to possess nutrients or compounds that might lend protection against diseases. However, all nutritious foods can support health in some way; Controversy 2 provides the details.
- natural foods** a term that has no legal definition but is often used to imply wholesomeness.
- nutritional** a term used to describe a product that has been isolated from food, often sold in pill form and believed to have medicinal effects (see Chapter 2).
- organic foods** understood to mean foods grown without synthetic pesticides or herbicides. In chemistry, however, all foods are made mostly of organic (carbon-containing) compounds. (See Controversy 2 in Chapter 22 for details.)
- partioned foods** foods composed of parts of whole foods, such as butter (from milk), sugar (from beets or cane), or corn oil (from corn). Partioned foods are generally processed and provide few nutrients with many calories.
- processed foods** foods subjected to any process, such as milling, alteration of texture, addition of additives, cooking, or others. Depending on the starting material and the process, a processed food may or may not be nutritious.
- staple foods** foods used frequently or daily, for example, rice (in East and Southeast Asia) or potatoes (in Ireland). If well chosen, these foods are nutritious.

Why do people choose foods?

Positive associations

Region of country

Social pressure

Values or beliefs

Weight

Nutritional value

Benefits of Physical Activity

Increased cardiovascular endurance

Increased muscle strength and endurance

Increased flexibility

Reduced risk of cardiovascular diseases

Reduced risk of type 2 diabetes

Reduced risk of cancer, especially colon and breast

Feeling of vigour

Feeling of belonging and companionship

Improved mental outlook and lessened likelihood of depression

Improved mental functioning

Improved bone density

Strong self-image and belief in ones abilities

Reduced body fat and increased lean tissue

Youthful appearance, healthy skin, and improved muscle tone

Increased independence in the elderly

Sound, beneficial sleep

Faster wound healing

Lessening of menstrual pain

Improved resistance to infection

Calorie Values

carbs 4cal/g

fats 9cal/g

protein 4cal/g

Acceptable Nutrient Ranges

carbs 45-65%

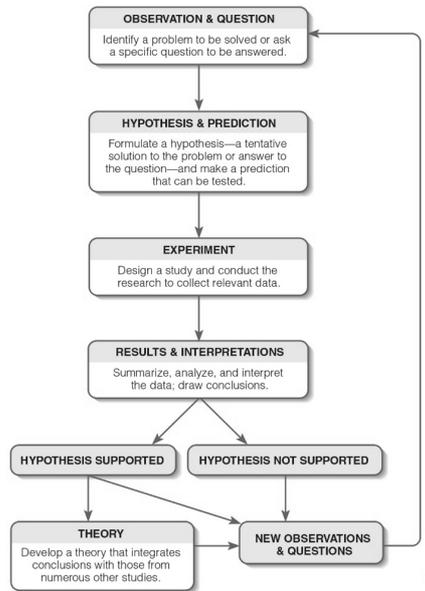
fats 20-35%

protein 10-35%

The Scientific Method

Figure 1-3
The Scientific Method

Research scientists follow the scientific method. Note that most research projects result in new questions, not final answers. Thus, research continues in a somewhat cyclical manner.



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Research Design Terms

Table 1-8
Research Design Terms

- blind experiment** an experiment in which the subjects do not know whether they are members of the experimental group or the control group. In a double-blind experiment, neither the subjects nor the researchers know to which group the members belong until the end of the experiment.
- case studies** studies of individuals. In clinical settings, researchers can observe treatments and their apparent effects. To prove that a treatment has produced an effect requires simultaneous observation of an untreated similar subject (a case control).
- control group** a group of individuals who are similar in all possible respects to the group being treated in an experiment but who receive a sham treatment instead of the real one. Also called control subjects. See also experimental groups and intervention studies.
- correlation** the simultaneous change of two factors, such as the increase in weight with increasing height (a direct or positive correlation) or the decrease in cancer incidence with increasing fibre intake (an inverse or negative correlation). A correlation between two factors suggests that one may cause the other but does not rule out the possibility that both may be caused by chance or by a third factor.
- epidemiological studies** studies of populations; often used in nutrition to search for correlations between dietary habits and disease incidence, a first step in seeking nutrition-related causes of disease.
- experimental group** the people or animals participating in an experiment who receive the treatment under investigation. Also called experimental subjects. See also control group and intervention studies.
- intervention studies** studies of populations in which observation is accompanied by experimental manipulation of some population members—for example, a study in which half of the subjects (the experimental subjects) follow diet advice to reduce fat intake while the other half (the control subjects) do not, and both groups' heart health is monitored.
- laboratory studies** studies that are performed under tightly controlled conditions and are designed to pinpoint causes and effects. Such studies often use animals as subjects.
- placebo** a sham treatment often used in scientific studies; an inert harmless medication. The placebo effect is the healing effect that the act of treatment, rather than the treatment itself, often has.
- randomized controlled trials (RCT)** sometimes also referred to as clinical trials, studies in which the subjects are selected in such a way that they have an equal chance of being included in the experimental/treatment group or the control group. This type of study is considered the gold standard in research.

Canadas Food Guide Dietary Guidelines

Table 1-8

Summary of Nutrition Recommendations in Canada's Food Guide

Along with recommending that we “Eat a variety of healthy foods each day” from the three food categories in the Food Guide that will allow Canadians to obtain the necessary nutrients that contribute to overall health (including a healthy body weight) and vitality and help reduce the development of chronic diseases, it also

- Recommends that we “Eat well. Live well.” in the following ways:
 - “Eat a variety of healthy foods each day”
 - “Make water your drink of choice”
 - Limit foods and beverages high in
 - Calories
 - Fat
 - Sugar (including that found in soft drinks, juices, and sweetened hot and cold drinks)
 - Sodium (salt)
 - Alcohol
- Provides numerous “directional statements” and “actionable tips” to help us make healthy food choices
- Recommends that we replace saturated fats with unsaturated fat
- Recommends that we read and compare food labels including the Percent Daily Values to help us make informed and wise food choices; for example, those that contain less
 - Saturated fat
 - Trans fat
 - Sugar
 - Sodium
- Provides advice on the relationship between energy intake and our level of physical activity

Source: Adapted from Canada's Food Guide, 2019.

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Nutrient Recommendations

Table 2-1
Nutrient Standards

Standards from the DRI Committee

Dietary Reference Intakes (DRI) a set of five lists of nutrient intake values for healthy people in Canada and the United States. These values are used for planning and assessing diets:

- recommended dietary allowances (RDA)** nutrient intake goals for individuals; the average daily nutrient intake level that meets the needs of nearly all (97% to 98%) healthy people in a particular life stage and gender group.⁴ Derived from the estimated average requirements (EAR; see below).
- adequate intakes (AI)** nutrient intake goals for individuals are set whenever scientific data are insufficient to allow establishment of an RDA value; the recommended average daily nutrient intake level based on intakes of healthy people (observed or experimentally derived) in a particular life stage and gender group and assumed to be adequate.⁴
- estimated average requirements (EAR)** the average daily nutrient intake estimated to meet the requirement of half of the healthy individuals in a particular life stage and gender group; used in nutrition research and policymaking and the basis upon which RDA values are set.
- tolerable upper intake levels (UL)** the highest average daily nutrient intake level that is likely to pose no risk of toxicity to almost all healthy individuals of a particular life stage and gender group. Usual intake above this level may place an individual at risk of illness from nutrient toxicity.
- chronic disease risk reduction (CDRR)** a new DRI category based on chronic disease risk; for example, keeping the sodium intake below the CDRR is expected to reduce the risk of chronic disease for the otherwise healthy population, while intakes above it will increase risk.
- acceptable macronutrient distribution ranges (AMDR)** values for carbohydrate, fat, and protein expressed as percentages of total daily caloric intake; ranges of intakes set for the energy-yielding nutrients that are sufficient to provide adequate total energy and nutrients while reducing the risk of chronic diseases.

Daily Values

Daily Values (DV) nutrient reference standards used on food labels, in grocery stores (and on some restaurant menus and websites in Canada and the United States). The DV allow comparisons among foods with regard to their nutrient contents.

⁴For simplicity, this book combines the two sets of nutrient goals for individuals (AI and RDA) and refers to them as the DRI recommended intakes. The AI values are not the scientific equivalent of the RDA, however.

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