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1). A functional food is a food giving an additional function. (Often related to health promoting or disease prevention) by adding new ingredients or more existing ingredients.

Definition:

It is the natural or processed food that contains known biological active compounds, which when in defined quantitative and qualitative amount provides a clinically proven and health benefit and therefore an important source in the prevention management and treatment of chronic diseases of the modern age.

Functional food is a food claimed to have an additional function by adding new ingredients or more of existing ingredients. The term may also apply to traits purposely bred into existing edible plants, such as purple or gold potatoes having enriched anthocyanin or carotenoid contents, respectively.

Functional foods are ingredients that offer health benefits that extend beyond their nutritional value. Some types contain supplements or other additional ingredients designed to improve health.

The concept originated in Japan in the 1980s when government agencies started approving foods with proven benefits in an effort to better the health of the general population.

Some examples include foods fortified with vitamins, minerals, probiotics, or fiber. Nutrient-rich ingredients like fruits, vegetables, nuts, seeds, and grains are often considered functional foods as well.

Oats, for instance, contain a type of fiber called beta glucan, which has been shown to reduce inflammation, enhance immune function, and improve heart health.

Similarly, fruits and vegetables are packed with antioxidants, which are beneficial compounds that help protect against disease.

b)). Functional foods can be considered to be those whole, fortified, enriched or enhanced foods that provide health benefits beyond the provision of essential nutrients (e.g., vitamins and minerals), when they are consumed at efficacious levels as part of a varied diet on a regular basis.

Conventional foods: These are the most basic of the functional foods because they haven’t been modified by enrichment of fortification they are still in their natural state. Most fruits and vegetables fall into these categorizes because they are rich in phytochemicals. Such as; lycopene, lutein,quercetin,rutin.

Modified foods: They are enriched, fortified or enhanced foods. With nutrients or other beneficiary ingredients e.g Calcium Fortified orange juice folic Acid enriched bread, Magrine enhanced with plant sterols are functional foods that have been modified. Also some energy drinks that has been enhanced with herbs. e.g. Ginsengin Guarana.

Medical foods: Its defined as a formulated food to be consumed or administered enterally under the supervision of a physician and which is intended for the specific diatery managnement of a diseased or condition for which distinctive nutritional requirements based on recognized scientific principles are establishment by medical evaluation. It includes medical formulas designed for people with specific health problems.

Food For Special Dietary Use: They are similar to medical foods but they are available commercially and don’t require the supervision of a health care provider. These foods fill special dietary needs that are due to specific health condition such as lactose intolerance, obesity. Infants are also in this category.

Gluten Free Foods, Lactose free dairy products and foods designed to aid weight loss are considered as food for special diatery use if you have the condition.

c). This review highlights, from a nutritional biochemistry perspective, differential aspects on designing and interpreting human studies to support the health effects of functional foods.

The list of foods and ingredients includes essential and non-essential nutrients, plant and marine components, whole foods, microorganisms, microalgae and technological approaches. Traditionally, health outcomes focussed on the prevention of chronic diseases but health targets have expanded to cover areas such as brain health, inflammation, eye health, women´s health, healthy ageing and beauty.

Despite the available evidence from in vitro, animal and observational studies, well designed human studies are necessary to support the health effects of functional foods. Intervention trials with foods are complex as they imply limitations due to methodological, food-related and host-related factors. The use of responsive, validated and clinically relevant markers becomes essential even though there is a lack of reliable biomarkers of exposure for many bio actives. Furthermore, the effect of modulating factors such as subclinical inflammation, gut microbiota and genetic variability should be taken into account. Multiple indicators may provide a more reliable alternative to assess physiological processes while emerging biomarkers (microRNAs, epigenetic changes) constitute a promising approach. Additionally, the magnitude of the change is critical to support any health effect although interventions may have a limited clinical impact but be epidemiologically relevant. Also, based on the available data, the premise that bioactivescontaining foods are safe may be questionable.

An integrated approach including multiple biomarkers, genetic variability, effect of gut microbiota and risk/benefit assessment should be used to support the potential health effects of functional foods.

2). Nutritional assessment is used to determine whether a person or group of people is well nourished or malnourished (over-nourished or under-nourished). It involves the interpretation of anthropometric, biochemical (laboratory), clinical and/or dietary data. Nutritional assessment is the interpretation of anthropometric, biochemical (laboratory), clinical and dietary data to determine whether a person or groups of people are well nourished or malnourished (over-nourished or under-nourished).

Nutritional assessment can be done using the ABCD methods. These refer to the following:

A.Anthropometry

B.Biochemical/biophysical methods

C.Clinical methods

D.Dietary methods.

The word anthropometry comes from two words: Anthropo means ‘human’ and metry means ‘measurement’. In your community you will be able to use anthropometric measurements to assess either growth or change in the body composition of the people you are responsible for.

b) Anthropometry is the measurement of physical dimensions such as height or weight, as well as the fat mass composition of the human body to provide information about a person's nutritional status. ... There are procedures for measuring length, height, weight and MUAC. Weight-for-age is an index used to assess child growth.

Anthropometric measurements used to assess growth

To assess growth in children you can use several different measurements including length, height, weight and head circumference.

 Length

A wooden measuring board (also called sliding board) is used for measuring the length of children under two years old to the nearest millimeter (as shown in Figure 5.1). Measuring the child lying down always gives readings greater than the child’s actual height by 1-2 cm.

Procedure

To measure the length of a child under two years, you need one assistant and a sliding board.

As you can see in Figure 5.1, you need an assistant to help you measure a child using this method.

Both assistant and measurer are on their knees (arrows 2 and 3).

The assistant holds the child’s head with both hands and makes sure that the head touches the base of the board (arrow 4).

The assistant’s arms should be comfortably straight (arrow 5).

The line of sight of the child should be perpendicular to the base of the board (looking straight upwards) (arrow 6).

The child should lie flat on the board (arrow 7).

The measurer should place their hands on the child’s knees or shins (arrow 8).

The child’s foot should be flat against the foot piece (arrow 9).

Read the length from the tape attached to the board.

Record the measurement on the questionnaire

Height

This is measured with the child or adult in a standing position (usually children who are two years old or more). The head should be in the Frankfurt position (a position where the line passing from the external ear hole to the lower eye lid is parallel to the floor) during measurement, and the shoulders, buttocks and the heels should touch the vertical stand. Either a stadiometer or a portable anthropometer can be used for measuring. Measurements are recorded to the nearest millimeter.

Procedure

As with measuring a child’s length, to measure a child’s height, you need to have another person helping you. Figure 5.2 illustrates the procedures, and in Figure 5.3 you can see a young child having his height measured.

Both the assistant and measurer should be on their knees (arrows 2 and 3).

The right hand of the assistant should be on the shins of the child against the base of the board (arrow 4).

The left hand of the assistant should be on the knees of the child to keep them close to the board (arrow 5).

The heel, the calf, buttocks, shoulder and occipital prominence (prominent area on the back of the head) should be flat against the board (arrows 6, 7, 14, 13 and 12).

The child should be looking straight ahead (arrow 8).

The hands of the child should be by their side (arrow 11).

The measurer’s left hand should be on the child’s chin (arrow 9).

The child’s shoulders should be levelled (arrow 10).

The head piece should be placed firmly on the child’s head (arrow 15).

The measurement should be recorded on the questionnaire (arrow 1).

Weight

A weighing sling (spring balance), also called the ‘Salter Scale’ is used for measuring the weight of children under two years old, to the nearest 0.1 kg. In adults and children over two years a beam balance is used and the measurement is also to the nearest 0.1 kg. In both cases a digital electronic scale can be used if you have one available. Do not forget to re-adjust the scale to zero before each weighing. You also need to check whether your scale is measuring correctly by weighing an object of known weight.

Adjust the pointer of the scale to zero level.

Take off the child’s heavy clothes and shoes.

Hold the child’s legs through the leg holes (arrow 1).

Hold the child’s feet (arrow 2).

Hang the child on the Salter Scale (arrow 3).

Read the scale at eye level to the nearest 0.1 kg (arrow 5).

Remove the child slowly and safely.

Sometimes you will have to improvise. For example in the field set up, it is difficult to measure very young children who cannot sit by themselves using the weighing pant attached to the scale. In addition, some children panic during the measurement and urinate, making the pant dirty. Therefore, mothers or caregivers may not be happy to let their children be measured in such a manner. The weighing scale with the pant can be improvised by using a plastic washing-basin which is attached to the Salter Scale and adjusting the reading to zero. You need to ensure the basin is as close to the ground as possible in case the child falls out, and to make the child feel secure during weighing. If the basin is dirty, then you need to clean it with a disinfectant. This is a much more comfortable and reassuring weighing method for the child and you can use it for ill children much more easily than the approaches described above.

3). Nutrition through the lifecycle. An individual's needs for nutrients and energy change over the life span. For example, while a typical adult woman may need only 6.7 milligrams of calcium per pound of body weight, a nine-month-old infant needs 27 milligrams of caclcium per pound of body weight.

It is during a body's growth periods that the need for nutrients is greatest. These occur during infancy, adolescence, and pregnancy. Once the growth period stops, energy needs and the need for certain nutrients declines.

The reasons behind a person's food choices also varies across the life span because social, psychological, economic, and leisure roles change during that time period. For example, during the teenage years, the opinions of peers and body image concerns become especially important. On the other hand, adults are more likely to be influenced by their health needs.

Infants

The member's manual discusses breastfeeding and bottlefeeding options. Research shows that breastfeeding is good for both baby and mother. If teenagers learn about the benefits of breastfeeding, they may be more likely to consider it when they are parents.

Generations ago, breastfeeding was the preferred feeding method. As formula became readily available, bottlefeeding became more popular. At the same time, a trend toward feeding babies solid food at an early age became popular as well. Today, trends in infant feeding are changing again. Breastfeeding has gained in popularity because of the nutritional benefits and antibodies (to protect againt infection adn allergies) that breast milk provides for the baby.

Early Childhood

Young children like to feed themselves just like they like to do everything else for themselves. It's easy to spill milk and make other messes as they learn how to eat! Parents and babysitters can help young children learn to eat and feed themselves by providing:

small utensils that are easy to hold.

plates with edges so that food won't slip off the plate.

small cups that won't tip over easily.

foods that can be picked up adn eaten with fingers.

small servings of food on a plate because too much can be overwhelming.

a high chair, booster seat, or cushions to reach the table.

Children who have positive experiences during family meals are more likely to develop healthy attitudes. This is an opportunity to reinforce good eating habits and to introduce a wide variety of foods. However, food should not be used to calm or cheer up children. That may result in children associating food with emotions and not hunger.

Children have small stomachs and cannot eat a lot of food at one time. It is easier to eat several snacks and meals than to eat three large meals a day. Bite-size pieces of raw fruits and vegetables and cheese cubes are ideal snacks. Other delicious, nutritious snacks include the following.

Overall health does not depend on a single food or a single meal, but on making good nutritional choices over a period of time. Usually there are nutritional equivalents that can be substituted for the foods a child refuses to eat. The following tips can help make foods fun.

Use cookie cutters to make sandwiches in the shapes of animals or toys.

Make sandwich ribbons, pinwheels (curled-up sandwich), or any other design.

Shape foods in unusual way, such as turkey, ham, or low-fat bologna roll-ups. For older children, toothpicks can hold cut vegetables in the shapes of boats or buildings.

Draw faces on fruits that are peeled, such as bananas, oranges, or tangerines. Or, cut a fruit in half, such as a peach, spread with yogurt or low-fat cream cheese and add raisins or other pieces of dried fruit for a fruit face.

Make a face on a sandwich. Peanut butter can be the “glue.” For the eyes, try raisins. For eyelashes and eyebrows, try parsley. For yellow hair try carrot curls. For a nose, try a carrot tip. For a mouth, try a slice of red pepper. Add arms and feet by attaching carrot or celery sticks.

Another factor that contributes to food selection is television. Children are influenced by the foods advertised on television. Before the age of seven or eight, few children can think critically about those advertised foods and may beg parents to buy a frequently advertised food.

Some children do not like milk or certain dairy products. Although some parents may be very concerned, there are nutritional alternatives to “sneak” milk in a child’s diet.

Consider certain dishes and combination foods that include milk and/or other dairy products, such as:

pizza,

pudding,

creamy soups,

macaroni and cheese, and

tacos or burritos with cheese.

What about ice cream? Ice cream, ice milk, and frozen yogurt are made from milk so they have calcium and other nutrients found in milk. However, they are also higher in fat and sugar. On occasion, ice cream can count as a serving from the Milk, Yogurt, and Cheese food group, but when this happens, the use of other fats and sweets should be reduced.

If a child has trouble digesting milk, some alternatives include:

drinking a small amount at one time,

eating yogurt or cheese,

drinking milk to which lactase has been added. Lactase is an enzyme which breaks down the sugar in milk (lactose). Lactase tablets are available to add yourself.

foods listed in the Alternative Sources of Nutrients in Milk chart on page 5.

Teenage Years

A child’s body begins a period of rapid change in size and shape approximately around the age of 10 years in girls and 12 years in boys. This is called the “adolescent growth spurt.” During the next four years, an average girl may grow 10 inches taller and gain 40 to 50 pounds. An average boy may grow 12 inches taller and gain 50 to 60 pounds. At the same time, their body shape begins to change, too.

The adolescent growth spurt requires many different nutrients. Calcium is especially important for bone growth and health because 45% of the bone an adult has is built up during adolescence. See the chart below for sources of calcium and what to do if a teen has trouble digesting milk or doesn’t like milk.

Although some teenagers become concerned that they are not changing as rapidly as their friends or other classmates in school, there is wide variation in the age at which the adolescent growth spurts starts. It is generally more dependent on the hereditary characteristics than on being a certain age.

How an adolescent feels about their body is closely related to how they feel about themselves. It is important for teenagers to:

know that change is normal,

take care of the body they have, and

talk to supportive family members and friends.

It is important to emphasize that changes in body size and shape are part of normal adolescent development. Females gain proportionally more body fat during this time, while males gain proportionally more muscle and bone mass.

One of the changes taking place during adolescence is the varying hormonal levels in the body. These hormones are responsible for the changes seen in the physical development of the body and secondary characteristics such as facial hair growth and deepening voices.

Pregnancy

Pregnancy is a special time in a woman’s life. Healthy eating can increase the chances of having a healthy baby. Gradual weight gain is important; 2-4 pounds during the first three months, then a little less than 1 pound per week for the remainder of the pregnancy. A total gain of 25-35 pounds is recommended.

If a woman is overweight at the beginning of the pregnancy, she should not diet, but instead limit the amount of desserts and other “extras.” She needs to continue a gradual line of weight gain parallel to the lines on the Weight Gain during Pregnancy chart in Member’s Manual Level D (p. 9).

If a woman is underweight at the beginning of pregnancy, she should increase her food intake and continue a gradual line of weight gain parallel to the lines in the above mentioned chart.

In addition, a pregnant woman has specific water and fluid needs, including to:

drink at least 6-8 cups of fluid daily;

limit the amount of caffeine-containing beverages;

limit soft drinks and sugared drinks; and

consume beverages that contain aspartame and saccharin in moderation.

All the weight gained goes directly to the baby and the mother’s tissue stores. Since the majority of the weight gain goes to the baby, a small weight gain can mean too small a baby. The following chart describes the location of the weight gain.

Older Adults

Throughout a lifetime, three of the keys to good health have been to:

eat a variety of nutritious foods;

limit the amount of fat, salt, and sugar in the diet; and

regular exercise.

Although these keys cannot guarantee good health, they can help an individual stay healthy as they grow older or perhaps improve health. However, older adults often have special nutritional needs because:

they need fewer calories than younger people to stay at the same weight; and

certain health problems become more common as people grow older.

After the teen years, the need for calories decreases approximately 5% every 10 years. Thus, a 60-year-old needs 20% fewer calories than a 20-year-old of the same weight. The best way for older adults to stay at the same weight is to:

eat less, and/or

exercise more.

The vitamin and mineral needs of healthy older adults appear to be similar to those of younger adults, although few studies on the nutrient requirements of the elderly have been conducted. Recent studies have shown that although older adults need fewer calories, the requirements for protein and calcium were somewhat higher in older adults than in younger adults. One explanation for these results could be that older adults absorb these nutrients less efficiently. Thus, older adults should be encouraged to consume recommended amounts of protein foods including milk, especially since a common problem among older adults is their rejection of meat and milk. However, as with other age groups, excess protein should be avoided.

Many older adults have difficulty chewing and swallowing food. Resolving these problems is critical to the nutritional status of the elderly. The following suggestions for easy to chew and swallow protein-rich foods may be helpful:

vegetables served in a cream or cheese sauce;

raw fruits and vegetables chopped or grated in a gelatin salad;

eggs cooked any way;

legumes, such as split peas, navy beans, lima beans, pinto beans, and kidney beans;

fish; and

ground meats or finely chopped meats.

Another problem characteristic of the elderly is diminished thirst.

Although the kidney usually concentrates the urine to conserve body water, the elderly tend to excrete a more dilute urine. In addition, an aging kidney loses functioning units and is less able to cope with stress. This situation may result in a decreased amount of body fluids; the composition of these body fluids may change as well which can be potentially fatal.

It is extremely important to make certain that older persons drink sufficient fluids to replace fluid losses. Dehydration is a serious threat to the elderly. Fruit juices, milk, and even coffee, tea, soft drinks, “ades,” popsicles, ices, and gelatin desserts are mainly water. Fluids should not be allowed to replace food at mealtimes but should be offered at meals and encouraged between meals.