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The role of nutrition for exercise and health

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Abstract
Nutrition is the process of providing or obtaining the food necessary for health and growth. It broadly encompasses all actions necessary for obtaining, handling, preparing, serving, eating and utilization of food by the body. When individuals or communities do not feed appropriately they face a possibility of becoming malnourished and can face serious health problems. Extension workers should promote good nutrition in the community.
Good nutrition refers to a state when the food we eat is able to provide the recommended amounts of nutrients for the body to perform all its physiological activities. It is dependent on one's age, physiological status, physical activity level and sex. Good nutrition is important throughout the life cycle; right from pre-conception, conception, pregnancy, infancy, childhood, adolescence and adulthood. Good nutrition makes an individual healthy, more productive and improves the quality of life.
Carbohydrates are the preferred fuel for physical activities of high intensity and short duration. The importance of fat as an exercise energy source depends on the availability of carbohydrates. Fats are primarily used when the body performs low-intensity muscular work, thus, sparing the store of carbohydrate. The fitter the individual greater is the carbohydrate sparing. Protein is one of the most essential and multi-purpose nutrients. Animal sources such as meat, fish, eggs, and/or dairy products are often referred to as "complete" protein foods, whereas vegetable sources are described as being "incomplete" as protein content is concerned. Vitamins contribute to chemical processes that regulate metabolism, energy release, and tissue repair. No vitamins can be synthesized by the human body. Minerals make up 4% of our body weight. They are involved in many biological functions, including energy production, bone structure, and oxygen carrying. Healthy and physically active people who eat well-balanced meals consume enough of the essential micronutrients to maintain proper physiological functioning.

Keywords: Carbohydrates, fats, minerals, nutrition, proteins, vitamins

Introduction
The world is in the midst of an unprecedented "exercise-boom," reflected by the ever-growing number of people engaged in some form of physical activity for pleasure as well as health. Indeed, while for many decades it was almost prohibited in patients with certain medical conditions (e.g., heart disease, rheumatoid arthritis, and diabetes), it has now become apparent that physical activity is an important element of the rehabilitation process in such medical conditions, however, and fundamental to these issues are the nutritional status and dietary intakes of the exercising individuals.
It has been established that diet can affect physical performance and health in both athletes and non-athlete. Citizens of industrialized countries tend to regard the intake of food in a rather passive manner. This seems to be the result of a general lack of understanding of what constitutes optimal nutrition and how the latter regulates our bodily functions. Some of the food we eat is used to build, maintain, or repair the body cells, while the majority is processed (i.e., metabolized) for energy (ATP) production.
Most of this energy appears as heat and is used to keep the body warm; some are used for work of cells, and some for muscular work. Bodybuilding requirements determine the quality of diet, whereas the energy needs of the individual determine the quantity of diet; therefore, optimal nutrition is a dietary balance of different nutrients to keep the bodily functions at the required levels. In the watery medium of the cell, the delicate blending of carbohydrates, proteins, and fats, along with vitamins and minerals, make it possible. In this chapter, aspects related to these nutrients will be briefly discussed.

Carbohydrates
Carbohydrate is the body's preferred energy source and the most important fuel for the working muscle. During exercise of high intensity and brief duration, this nutrient provides

most of the energy needs. As a practical rule, both men and women should eat 7–10 g of carbohydrate per kg body weight per day each gram of carbohydrate will produce four calories of energy and in the process will use 0.7 L of oxygen. Carbohydrates should constitute around 60% of the total daily energy intake. Carbohydrates are stored as glycogen in the liver (80–100 g) and in the muscle (300–400 g); both stores can be exhausted by hard exercise; the entire store of this fuel in the body will last for about 100 min of strenuous steady-paced cycling, running, dancing, etc. Liver glycogen can be made available to muscle when it is broken down to glucose and then released into the blood. This blood glucose is also taken up and used by many other tissues, including the brain, while liver glycogen content falls rapidly if no food is consumed.

Fats

Fats (or lipids) serve a variety of functions, including all three purposes of nutrition: To form and maintain body structures to regulate metabolism and to provide the second main source of energy. The importance of fat as an energy source depends on the intensity of exercise as well as on the availability of carbohydrates. Fats are used along with carbohydrates when the body performs low intensity/long duration type of work, thus, sparing the store of carbohydrate; the fitter the athlete the greater the carbohydrate sparing. However, if the body starts to run low on carbohydrate, it will increase its use of fat. This may affect physical performance as fat utilization is generally associated with low-intensity muscular activity. For example, that while 142 g baked potato contains 145 calories, the same 142 g of fried potato chips contains 795 calories.

Proteins

Protein is one of the most essential and multi-purpose nutrient, as it has a wide variety of physiological functions associated with optimal physical performance and health. Protein forms the structural basis of muscle tissue; it is involved in the growth and repair of damaged tissue and has a role in the metabolic process that converts both carbohydrates and fats into energy. If carbohydrate and fat fail to provide enough energy, protein will be switched on to provide any extra energy. Protein is broken down into amino acids. There are 25 main amino acids; 8 of them (called essential amino acids) cannot be manufactured in the body and have to be found in our food. Animal sources such as meat, fish, eggs, and/or dairy products are often referred to as "complete protein foods" as they contain all of the eight essential amino acids, and therefore, higher biological value. Vegetable sources are described as being "incomplete" as they lack at least one of the essential amino acids. The human body has no protein reserve/store comparable to its large energy stores of fat and moderate stores of glycogen. Hence, optimal levels of protein should be maintained in the dancers' body. The average person needs 0.8 g of protein per kg of his/her body-weight per day, which provides 10–15% of total daily energy intake.

Vitamins

Thirteen vitamins cannot be synthesized by the human body; they are nevertheless essential for maintaining optimal bodily function. These nutrients contribute to the various chemical processes which regulate metabolism, release energy, and repair tissue. Vitamins are either water-soluble or fat-soluble in nature. The nine water- soluble vitamins (i.e., C, B1, B2, B6, B12, niacin, pantothenic acid, folic acid, and biotin) have an important role in protein metabolism. They are not stored in the body-tissues to any appreciable extent, they are depleted as a result of strenuous exercise, and they are easily destroyed in processing and cooking. These vitamins can be mainly received through fresh fruit and vegetables. Apart from VitaminC, excess supplementation can aggravate existing medical conditions. The four fat-soluble vitamins are A, D, E, and K. Daily ingestion of these vitamins is not necessary, given that they are normally stored in the liver and in the fat cells of the adipose tissue.

As in the case of water- soluble vitamins, excess intake of fat-soluble vitamins can produce toxic effects. Foods that are rich in Vitamins C and E may provide some protection against cancer and heart diseases. These vitamins serve as antioxidants to counter the damaging effects of the reactive chemicals known as free radicals on the cell membranes.

Minerals

The body is composed of at least 31 known chemical elements. The most abundant non-metal chemical element is oxygen, which amounts to 65% of a person's body weight. Three other nonmetal elements constitute 31% of the body mass; these are carbon (18%), hydrogen (10%), and nitrogen (3%). The remaining 4% of our body weight is composed of a group of 22 metallic elements called minerals. These minerals can further be classified into major minerals and trace minerals. Humans obtain their mineral nutrition from both plants and animals. Drinking water is also an excellent source of many minerals.

Conclusions

In the watery medium of the cell, the delicate blending of carbohydrates, proteins, and fats, along with vitamins and minerals is necessary to keep the bodily functions at the required levels. Healthy individuals who eat well-balanced meals consume enough of these nutrients and there is no need for supplementation. However, prolonged deficits in any of the nutrients can cause health and physical performance impairments.

References

1. Braun MU, Rauwolf T, Zerm T, Schulze M, Schnabel A, Strasser RH. Long term biventricular resynchronisation therapy in advanced heart failure: Effect on neurohormones. Heart. 2005;91:601-605.
2. Food and Agriculture Organization (FAO). Agriculture, food and nutrition for Africa: A resource book for teachers. Rome: FAO. FAO. 2008. Mycotoxin Prevention and Control in Food Grains. Rome: FAO; c1997.
3. FAO/World Health Organisation (WHO). Document for Information and Use in Discussions Related to Contaminants and Toxins of the GSCTF, Report No. CF/2 INF/1 to the Codex; c2008.
4. Gbemenou Joselin Benoit Gnonlonfin, PACA Training Notes, Afflatoxin analysis in food and feed Uganda; c2014.
5. Hoona J. Presentation on Food Safety, Addis, Ethiopia. Nutrition Implications of Aflatoxin Exposure: An Analysis of Mothers and Children in Timor-Leste's.

Food and International Food Policy Research Institute (IFPRI). Decisions, Gender and Development. A Synthesis of Recent Research, Washington D.C; c2014.
6. IFPRI. Global Nutrition Report: Actions and Accountability to Accelerate the World's Progress on Nutrition; c2014.
7. Scrimshaw NS. Malnutrition, brain development, learning, and behavior nutrition; c2009.
8. Quisumbing AR. What Have We Learned? From Research on Intra household Allocation? in Household; c2003.
9. Ross IJ, Hamilton HE, White GM. Principles of Grain Storage, AEN-20; c1990.
10. Smith LC, Haddad L. Overcoming Malnutrition in Developing Countries. Past Achievements and Future Choices. Food, Agriculture and the Environment. Discussion Paper 30, IFPRI; c2000.
11. Eurenius E, Stenstrom CH. Physical activity, physical fitness, and general health perception among individuals with rheumatoid arthritis. Arthritis Rheum. 2005;53:48-55.
12. Montero A, Lopez-Varela S, Nova E, Marcos A. The implication of the binomial nutritionimmunity on sportswomen's health. Eur J Clin Nutr. 2002;56(Suppl 3):S38-S41.
13. Johansen KL, Kaysen GA, Young BS, Hung AM, da Silva M, Chertow GM. Longitudinal study of nutritional status, body composition, and physical function in hemodialysis patients. Am J Clin Nutr. 2003;77:842-846.