Nutrition and Bacteria of the Body

 Nutrition is a vital component of the science behind biology. Biology is defined as the study of life; nutrition is defined as providing food necessary for health and growth (Merriam-Webster). Adequate nutrition for health, also promotes growth of healthy bacteria within the intestinal cells. Bacteria of the intestine, or gastrointestinal tract, is especially important in relation to nutrition. The bacteria that makes up the gastrointestinal tract are what makes up the microbiome. Microbiome is defined as “a community of microorganisms that inhabit a particular environment and especially the collection of microorganisms living in or on the human body” (Merriam-Webster). The foods we consume affect the makeup of our microbiome at the molecular level. By consuming nutrient-rich foods, the microbiome is promoted to grow healthy bacteria that aid in digestion and other dietary related processes.

 There are five different building blocks that work collaboratively to make up the study of nutrition. These building blocks are named nutrients; nutrients are defined as “chemical compounds in food that are used by the body to function properly and maintain health” (Health Terms: Nutrition). The five main nutrients are proteins, fats, carbohydrates, vitamins, and minerals. Proteins are found throughout the entirety of tissues within the body, especially in bones and muscles. According to the Dietary Guidelines 2015-2020, the recommended intake of protein for males age 14-18 is 5.75-7 ounces, and for females is 5.50-6.25 ounces. Currently, the average intake for both groups is lower than the recommended dietary intake. There are multiple types of fats, saturated and trans, are solid at room temperature and are unhealthy when overconsumed that can lead to chronic disease later on in life. Unsaturated fat is “healthy fat” meaning that it is liquid at room temperature and can be found in cooking oils and fish. Carbohydrates are converted during digestion to glucose (sugar) that is used as energy throughout the body in the cells, tissues, and organs. There are also two different types of sugars, simple and complex. Simple sugars like fructose are found in natural sources like fruits. Complex sugars are found in foods like potatoes, whole grain bread, and legumes. Vitamins and minerals are sub-groups of proteins, fats, and carbohydrates, and are the nutrients that make up all foods. Like protein, they are not stored in the body and must be consumed every day to meet the Dietary Guideline’s recommendations (Dietary Guidelines Chapter 2).

It is especially important in adolescence to meet all the recommended intakes set by the Dietary Guidelines in order to promote healthy growth. Produced by the United States Department of Agriculture, Choose MyPlate is an essential resource for information on what to eat and how much to eat (Start Simple with MyPlate). Also, there are recommendations of healthy foods to choose from in each major nutrient category.

The largest number of bacteria is found within the gastrointestinal tract and coexists peacefully in a healthy person. The functionality of a healthy microbiome is so essential that “[it] is even labeled a supporting organ because it plays so many key roles in promoting the smooth daily operations of the human body” (The Microbiome, 2017). The microbiome is as unique as each individual person. It also serves to protect the body from harmful pathogens that cause disease. The microbes within the microbiome are named microbiota and are the catalysts for keeping the microbiome functional. A way to ensure that microbiota is functional and healthy is to supplement the normal diet with probiotics. Probiotics are defined as, “foods that naturally contain microbiota, or supplement pills that contain live active bacteria—advertised to promote digestive health” (The Microbiome). Due to probiotics being in their own separate category as supplements and not as food or drug, “they are not regulated by the Food and Drug Administration in the U.S.” (The Microbiome).

 The research in the field of Nutrition and the Microbiome is ever-evolving and still has much left to be discovered. In recent years, The NIH Human Microbiome Project was created to further understand how microbial flora is involved in health and disease of humans (NIH Human Microbiome Project). After the initial phase, a second phase was developed, The Integrative Human Microbiome Project was developed to “study these interactions by analyzing microbiome and host activities” (The Integrative Human Microbiome Project). In this second phase of the Human Microbiome Project, there are three different longitudinal studies being measured: pregnant women, gut disease like IBD, and onset of type 2 diabetes. The Integrative Human Microbiome Project began in 2014 and will lead to more phases of the Human Microbiome Project in the future to fully study the complexities of human health and disease.

Reference

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