

Fiber, a component for health gastrointestinal endocrine system -

Fazakas Zita¹, Tarcea Monica², Guiné Raquel³

¹*Department of Biochemistry, University of Medicine and Pharmacy Tirgu-Mures*

²*Department of Community Nutrition and Food Safety, University of Medicine and Pharmacy Tirgu-Mures*

³*Department of Food Science and Technology, Food Science Research Institute, Viseu, Portugal*

Dietary fiber was classified according to its solubility in an attempt to relate physiological effects to chemical types of fiber. *Soluble fibers* (B-glucans, gums, wheat dextrin, psyllium, pectin, inulin) were considered to have benefits on serum lipids, while *insoluble fibers* (cellulose, lignin, pectins, hemicelluloses) were linked with laxation benefits. More important characteristics of fiber in terms of physiological benefits are viscosity and fermentability. *Viscous fibers* (pectins, B-glucans, gums, psyllium) are those that have gel-forming properties in the intestinal tract, and *fermentable fibers* (wheat dextrin, pectins, B-glucans, gum, inulin) are those that can be metabolized by colonic bacteria.

Objective: To summarize the beneficial effects of dietary fiber, as nutraceuticals, in order to maintain a healthy gastrointestinal system.

Methods: Our study is a systematic review. Electronic databases, including PubMed, Medline, with supplement of relevant websites, were searched. We included randomized and non-randomized clinical trials, epidemiological studies (cohort and case-control). We excluded case series, case reports, in vitro and animal studies.

Results: The WHO, the U.S. Food and Drug Administration (FDA), the Heart Foundation and the Romanian Dietary Guidelines recommends that adults should aim to consume approximately 25–30 g fiber daily. Dietary fiber is found in the indigestible parts of cereals, fruits and vegetables. There are countries where people don't eat enough food fibers, these people need to take some kind of fiber supplement. Evidence has been found that dietary fiber from whole foods or supplements may (1) reduce the risk of cardiovascular disease by improving serum lipids and reducing serum total and low-density lipoprotein (LDL) cholesterol concentrations, (2) decreases the glycaemic index of foods, which leads to an improvement in glycemic response, positive impact on diabetes, (3) protect against development of obesity by increasing satiety hormone leptin concentrations, (4) reduced risk of developing colorectal cancer by normalizes bowel movements, improve the integrity of the epithelial layer of the intestines, increase the resistance against pathogenic colonization, have favorable effects on the gut microbiome, wich is the second

genomes of the microorganisms, (5) have a positive impact on the endocrine system by gastrointestinal polypeptide hormonal regulation of digestion, (6) have prebiotic effect by short-chain fatty acids (SCFA) production; butyrate acid is the preferred energy source for colonic epithelial cells, promotes normal cell differentiation and proliferation, and also help regulate sodium and water absorption, and can enhance absorption of calcium and other minerals. Although all prebiotics are fiber, not all fiber is prebiotic. This generally refers to the ability of a fiber to increase the growth of bifidobacteria and lactobacilli, which are beneficial to human health, and (7) play a role in improving immune function via production of SCFAs by increases T helper cells, macrophages, neutrophils, and increased cytotoxic activity of natural killer cells.

Conclusion: Fiber consumption is associated with high nutritional value and antioxidant status of the diet, enhancing the effects on human health. Fibers with prebiotic properties can also be recommended as part of fiber intake. Due to the variability of fiber's effects in the body, it is important to consume fiber from a variety of sources. Increasing fiber consumption for health promotion and disease prevention is a critical public health goal.

Keywords: dietary fiber, prebiotics, short chain fatty acid, gastrointestinal system, enteric endocrine system