Chapter 2
Dietary Fibers and their Role as Functional Food for Human Health: Food Fibers and Human Health

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ABSTRACT
This chapter mainly summarizes the sources of dietary fibers and how they act as functional food for benefiting the human health. Dietary fibers could be soluble and insoluble in water and the major sources are fruits, vegetables, nuts and whole grains. Dietary fibers play role in the control of various disorders like cardiovascular diseases, digestive disorders, diabetes, obesity and colonic cancer. Dietary fibers benefit the human health by acting through various mechanisms in the gastrointestinal tract. According to the WHO recommendations at least 25 g of dietary fiber per day should be consumed. Effect of food processing practices on the physiochemical and functional properties of dietary fibers is also covered in this chapter.

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INTRODUCTION

Ancient Greek physicians had some knowledge of prevention of constipation by using food items that had bulked excretions (British Nutrition Foundation, 1990). Fibers are the components of plant material that resist the human digestive enzymes. According to the Institute of Medicine which contains the dietary fiber can be defined as the non-digestible carbohydrates and lignin that are intrinsic and intact in plants; whereas the functional fiber consists of isolated, non-digestible carbohydrates that have beneficial physiological effects in humans and total fiber is the sum of both. According to the American Association of Cereal Chemists the dietary fiber is the edible parts of plants or analogous carbohydrates that are resistant to digestion and absorption in the human small intestine with complete or partial fermentation in the large intestine and as per this association the dietary fiber includes polysaccharides, oligosaccharides, lignin and associated plant substances. Dietary fibers promote beneficial physiological effects including laxation, blood cholesterol attenuation and blood glucose attenuation. The codex committee on nutrition and foods for special dietary uses defines dietary fiber (adopted as Codex definition, July 2009) as carbohydrate polymers with ten or more monomeric units that are not hydrolyzed by the endogenous enzymes in the small intestine of humans. They are classified into the following categories (Daniel, 2006; Lupton, 2010):

1. Edible carbohydrate polymers naturally occurring in the food.
2. Carbohydrate polymers which have been obtained from raw food material by physical, enzymatic or chemical means.
3. Synthetic carbohydrate polymers. The indigestible portion of food derived from plants is termed as dietary fiber (roughage) and it has two main components, soluble fiber and insoluble fiber.

Where patients are on hospital stay, post-operation, bedridden, pain medication control, etc constipation should be watched to prevent unwanted complications such as bowel impaction, vitals instability, hemorrhoids or even death as a result of straining and consequent vagal stimulation. Easy way to prevent those complications is through anticipatory interventions like high fiber diet. Such dietary fiber helps in keeping intestinal and bowel health in good condition. Hence the current chapter deals with major sources of dietary fiber, major health benefits of dietary fiber, recommendations and guidelines for the dietary fiber intake and effects of various food processing operations on the quality of dietary fiber (Daniel, 2006).
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