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Dates: Received: 02 June, 2016; Accepted: 03 October, 2016; Published: 04 October, 2016

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www.peertechz.com

ISSN: 2455-8583

Mini Review

Dietary Fiber

Review

To the identification of food components that can optimize our physiological and psychological functions. This development, which aims to ensure the welfare, health and reduced susceptibility to disease during life, gave birth to the concept of “functional foods”.

“Dietary fiber is the remnants of the edible part of plants and analogous carbohydrates that are resistant to digestion and absorption in the human small intestine with complete or partial fermentation in the human large intestine.

It includes polysaccharides, oligosaccharides, lignin and associated plant substances. Dietary fiber exhibits one or more of either laxation (fecal bulking and softening; increased frequency; and/or regularity), blood cholesterol attenuation, and/or blood glucose attenuation. Reading the definition shows it is obvious that the committee deemed it necessary:

- 1) To clarify the constituent make up of dietary fiber; to recognize that a primary characteristic of dietary fiber is resistance to digestion and absorption in the small intestine.
- 2) To recognize that a primary characteristic of dietary fiber is fermentation in the large intestine
- 3) And to include key physiological impacts demonstrated in the past 30 plus years of research. Dietary fiber, also known as roughage or bulk, includes the parts of plant foods your body can't digest or absorb. Unlike other food components, such as fats, proteins or carbohydrates — which your body breaks down and absorbs — fiber isn't digested by your body. Instead, it passes relatively intact through your stomach, small intestine and colon and out of your body

Fiber is commonly classified as soluble, which dissolves in water, or insoluble, which doesn't dissolve.

Soluble fiber

This type of fiber dissolves in water to form a gel-like material. It can help lower blood cholesterol and glucose levels. Soluble fiber is found in oats, peas, beans, apples, citrus fruits, carrots, barley and psyllium.

Insoluble fiber

This type of fiber promotes the movement of material through your digestive system and increases stool bulk, so it can be of

benefit to those who struggle with constipation or irregular stools. Whole-wheat flour, wheat bran, nuts, beans and vegetables, such as cauliflower, green beans and potatoes, are good sources of insoluble fiber. Most plant-based foods, such as oatmeal and beans, contain both soluble and insoluble fiber.

“Dietary Fiber consists of the remnants of edible plant cells, polysaccharides, lignin and associated substances resistant to (hydrolysis) digestion by the alimentary enzymes of humans”. This definition defines a macro-constituent of foods which includes cellulose, hemicellulose, lignin, gums, modified celluloses, mucilages, oligosaccharides, and pectins and associated minor substances such as waxes, cutin, and suberin.

Constituents of dietary fiber

Non-Starch Polysaccharides and Resistant Oligosaccharides

Cellulose; Hemicellulose; Arabinoxylans; Arabinogalactans; Polyfructoses; Inulin; Oligofructans; Galactooligosaccharides; Gums; Mucilages; Pectins;

Analogous Carbohydrates

Indigestible Dextrins; Resistant Maltodextrins (from corn and other sources); Resistant Potato Dextrins; Synthesized Carbohydrate Compounds; Polydextrose; Methyl cellulose; Hydroxypropylmethyl Cellulose; Indigestible (“resistant”) Starches

Lignin

Substances Associated with the Non-Starch Polysaccharide and Lignin Complex in Plants

Waxes; Phytate; Cutin; Saponins; Suberin; Tannins

Sources of dietary fibre

Dietary fibre is found in fruits (pears, strawberries, blackberries, raspberries, currants, and oranges), vegetable (Brussels sprouts, artichoke, onion, garlic, corn, peas, green beans, broccoli), pulses (lentils, chickpeas, beans) and wholegrains (all bran and oat bran cereals, whole and mixed grain breads).

Advantages of dietary fibers

Bowel function: Dietary fibre, particularly insoluble fibre, helps prevent constipation by increasing stool weight and decreasing gut transit time. This effect is enhanced if fibre intake is paralleled by an increase in water intake.

The short chain fatty acids, produced when fibre is fermented by gut bacteria, are an important source of energy for colon cells and might inhibit growth and proliferation of gut tumour cells.

By improving bowel function, dietary fibre can reduce the risk of diseases and disorders such as diverticular disease or haemorrhoids, and may also have a protective effect on colon cancer



Blood glucose levels: Soluble fibre, may slow digestion and absorption of carbohydrates and hence lower the rise in blood glucose that follows a meal (postprandial) and insulin response. This can help people with diabetes improve control their blood glucose levels.

Blood cholesterol: Results of epidemiological studies identify another role for dietary fibre in the prevention of coronary heart disease (CHD) that of improving blood lipid profiles. Clinical trials confirm the results of these epidemiological studies. Isolated viscous fibres such as pectin, rice bran or oat bran lower both total serum cholesterol and low density lipoprotein (LDL or bad) cholesterol levels. At the same time, research continues to show that diets high in a mix of dietary fibre also protect against CHD.

Other: While prevention of constipation, improved blood glucose levels, and blood lipid profiles predominate as beneficial outcomes of a diet high in dietary fibre, other benefits are worth noting. For example, because fibre provides bulk in the diet, without added calories, it can have a satiating effect on appetite; helping in weight management.

In order to have all the benefits of fibre it is important to vary the sources of fibre in the diet. Diets with fruits, vegetables, lentils/beans and wholegrains not only provide dietary fibre but as well many other nutrients and food components essential to good health.

Red Yeast Rice may be considered in people with elevated plasma LDL Colestrol at an early stage in pre Disease stage tbove statins. At an earlier stage before the age of 40 yrs.

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Citation: Trivedi J (2016) Dietary Fiber. Glob J Obes Diabetes Metab Syndr 3(1): 006-007.