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5/14/2024

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Dietary fiber and whole grains contain a unique blend of bioactive components including resistant starches, vitamins, minerals, phytochemicals and antioxidants. As a result, research regarding their potential health benefits has received considerable attention in the last several decades. Epidemiological and clinical studies demonstrate that intake of dietary fiber and whole grain is inversely related to obesity, type two diabetes, cancer and cardiovascular disease (CVD). Generally speaking, dietary fiber is the edible parts of plants, or similar carbohydrates, that are resistant to digestion and absorption in the small intestine.

PDF Version of the webpage (first pages)

Fiber Botanical Information

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Keywords: Dietary fiber and whole grains contain a unique blend of bioactive components including resistant starches, vitamins, minerals, phytochemicals and antioxidants. As a result, research regarding their potential health benefits has received considerable attention in the last several decades. Epidemiological and clinical studies demonstrate that intake of dietary fiber and whole grain is inversely related to obesity, type two diabetes, cancer and cardiovascular disease (CVD). Generally speaking, dietary fiber is the edible parts of plants, or similar carbohydrates, that are resistant to digestion and absorption in the small intestine. These fractions include arabinoxylan, inulin, pectin, bran, cellulose, β-glucan and resistant starch.
Description and Research Abstract: Dietary fiber and whole grains contain a unique blend of bioactive components including resistant starches, vitamins, minerals, phytochemicals and antioxidants. As a result, research regarding their potential health benefits has received considerable attention in the last several decades. Epidemiological and clinical studies demonstrate that intake of dietary fiber and whole grain is inversely related to obesity, type two diabetes, cancer and cardiovascular disease (CVD). Generally speaking, dietary fiber is the edible parts of plants, or similar carbohydrates, that are resistant to digestion and absorption in the small intestine. These fractions include arabinoxylan, inulin, pectin, bran, cellulose, β-glucan and resistant starch.

Dietary fibre is that part of plant material in the diet which is resistant to enzymatic digestion which includes cellulose, noncellulosic polysaccharides such as hemicellulose, pectic substances, gums, mucilages and a non-carbohydrate component lignin. The diets rich in fibre such as cereals, nuts, fruits and vegetables have a positive effect on health since their consumption has been related to decreased incidence of several diseases. Influence of different processing treatments (like extrusion-cooking, canning, grinding, boiling, frying) alters the physico- chemical properties of dietary fibre and improves their functionality. Dietary fibre can be determined by different methods, mainly by: enzymic gravimetric and enzymic—chemical methods. This paper presents the recent developments in the extraction, applications and functions of dietary fibre in different food products.

Observational studies have shown that dietary fiber intake is associated with decreased risk of cardiovascular disease. Dietary fiber is a non-digestible form of carbohydrates, due to the lack of the digestive enzyme in humans required to digest fiber. Dietary fibers and lignin are intrinsic to plants and are classified according to their water solubility properties as either soluble or insoluble fibers. Water-soluble fibers include pectin, gums, mucilage, fructans, and some resistant starches.
In summary, pineapple shell is a promising source of dietary fiber containing associated polyphenols that exhibit antioxidant activity. This property together with the neutral color and flavor makes it a suitable fiber for a wide range of applications as a food ingredi- ent.

Analytically, dietary fiber is defined as nonstarch polysaccharides and lignin from plants. Lignin is a complex polymer of phenylpropane residues; the remaining dietary fiber components are polysaccharides. These polysaccharides resist digestion because they are non-a-linked-glucan-polysaccharides, whereas the human digestive tract appears to secrete only a-glucosidases (Southgate, 1982). Any degradation of dietary fiber in the human gastrointestinal tract results from the action of enzymes secreted by the intestinal microflora.

The health benefits of DFs (Dietary Fiber) include the prevention and mitigation of type 2 diabetes, cardiovascular disease and colon cancer. By modulating food ingestion, digestion, absorption and metabolism, DFs reduce the risk of hyperlipidemia, hypercholesterolemia and hyperglycemia. Emerging research has begun to investigate the role of DFs in immunomodulation. If substantiated, DFs could facilitate many biologic processes, including infection prevention and the improvement of mood and memory. This review describes the accepted physiologic functions of DFs and explores their new potential immune-based actions.

The health benefits of dietary fiber have long been appreciated. Higher intakes of dietary fiber are linked to less cardiovascular disease and fiber plays a role in gut health, with many effective laxatives actually isolated fiber sources. Higher intakes of fiber are linked to lower body weights. Studies have provided evidence that inulin and oligofructose (OF), lactulose, and resistant starch (RS) meet all aspects of the definition, including the stimulation of Bifidobacterium, a beneficial bacterial genus. Other isolated carbohydrates and carbohydrate-containing foods, including galactooligosaccharides (GOS), transgalactooligosaccharides (TOS), polydextrose, wheat dextrin, acacia gum, psyllium, banana, whole grain wheat, and whole grain corn also have prebiotic effects.

Since dietary fiber has shown to be beneficial with regard to metabolic syndrome, this dietary component was selected to test a hypothesis that a simple dietary recommendation promoting fiber may result in improving overall dietary quality and weight loss for patients with metabolic syndrome.

Excessive energy intake is linked with obesity and subsequent diet-related health problems, and it is therefore a major nutritional challenge. Compared with the digestible carbohydrates starch and sugars, fiber has a low energy density and may have an attenuating effect on appetite. Likewise, some fibers will increase satiety by being viscous or contribute to large and/or swollen particles, which may facilitate mastication and increase retention time in the stomach, or potentially through fermentation and an ensuing satiety-inducing endocrine feedback from the colon. Thus, fibers may clearly contribute to energy balance. The metabolizable energy content is very often considerably lower than the commonly used level of 8kJ per g fiber, and some fibers may reduce energy intake indirectly through satiety-inducing effects.

The hypocholesterolemic and hypoglycemic effects of various natural and semisynthetic dietary fibers have been studied for their poten- tial use in the prevention and improvement of metabolic syndrome. Of these dietary fibers, hydroxypropyl methylcellulose (HPMC) has been shown to lower plasma cholesterol and reduce weight gain. Reductions in plasma cholesterol and triglyceride levels were correlated with a decrease in plasma leptin and an increase in adiponectin. These results suggest that adipocytokines are regulated by HPMC and may play a pivotal role in the hypocholesterolemic effect.

Vitamins, carotenoids, tocopherols, flavonoids and a variety of plant extracts have been reported to possess potent anti-oxidant properties and have been widely used in the skin care industry either as topically applied agents or oral supplements in an attempt to prolong youthful skin appearance. Prevention is the best and most effective way to work against extrinsic skin aging effects. The best prevention strategy against the harmful action of free radicals is a well regulated lifestyle (caloric restriction, body care and physical exercise for body), with low stress conditions and a balanced nutritional diet, including anti-oxidative rich food.

In conclusion, this article has provided evidence that current dietary fiber intake levels may be insufficient to maintain colonic mucosal health and defense, and reduce inflammation and cancer risk in otherwise healthy people. Secondly, current commercial tube feeds generally overlook the metabolic needs of the colon, and when combined with antibiotics may predispose patients to dysbiosis, bacterial overgrowth with pathogens such as C difficile, and acute colitis, thus perpetuating critical illness.

Proper nutrition is an important parts of any ageing-well strategy. Ageing is a biological process which makes an organism more susceptible to disease and debility because of a gradual erosion in its adaptability to the environment. An older person is likely to need extra amounts of essential nutrients; and these are Calcium, Vitamin D, Vitamin B12, Zinc, Potassium, Folic acid and Fiber. The signs of aging include not only wrinkles, but also memory loss, decreased brain function, and an increasing risk for chronic diseases such as heart disease, osteoporosis, and cancer.

Diet can play a major role in cancer prevention. The international differences in cancer incidence are largely accounted for by lifestyle practices that include nutrition, exercise, and alcohol and tobacco use. About 50 percent of cancer incidence and 35 percent of cancer mortality in the U.S., represented by cancers of the breast, prostate, pancreas, ovary, endometrium, and colon, are associated with Western dietary habits. Cancer of the stomach, currently a major disease in the Far East, relates to distinct, specific nutritional elements such as excessive salt intake.

Dietary fiber has been associated with a reduced risk of colorectal cancer. However, it remains unclear at which stage in the carcinogenic pathway fiber may act or which food sources of dietary fiber may be most beneficial against colorectal cancer development.

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