



Indigestible components help your bowel movement

Dietary fiber has been considered as the non-nutritive portion of food. Since some research studies unveiled the fact that it is important to ameliorate conditions of diseases, it is considered to be the sixth nutrient. Perhaps surprisingly, there are other components that are beneficial for our intestines than dietary fiber. This issue will include explanations of indigestible components including dietary fiber.

◆◇ Dietary fiber is beneficial for bowel movement

Dietary fiber is not degraded by human’s digestive enzymes. It has two main components: soluble dietary fiber and insoluble dietary fiber. Soluble dietary fiber dissolves in water and its viscosity increases after its dissolution in water. On the other hand, insoluble dietary fiber does not dissolve in water which tend to contain water. It becomes bloated in several times to tens of times of the original volume once it contains water. How does dietary fiber that is considered as the non-nutritive portion of food become the prevention or amelioration of a disease condition? The most common characteristic is its effect against constipation especially insoluble dietary fiber. Once insoluble dietary fiber absorbs water, it bloats and increases the volume of feces which in turn facilitates defecation. Soluble dietary fiber becomes nutrients for the intestinal bacteria that produce acetate and butyrate. These compounds stimulate intestinal walls which enhance defecation. The effect of dietary fiber is not only a relief of constipation but also a variety of other functions. Soluble dietary fiber slows the rates of digestion and absorption of carbohydrates in diets which lets our body suppress the rise in the blood sugar and insulin levels. This will be a prevention and treatment for diabetes. The secretion of saliva also increases when we eat dietary fiber because dietary fiber requires a great mastication. It brings a sense of fullness and becomes a prevention against the overconsumption of foods. Many clinical studies have suggested the effect of a reduction in the level of serum cholesterol because dietary fiber slows the absorption of fats.

◆◇ Dietary fiber is beneficial for beauty purposes because it reduces toxins in the intestines

Relieving constipation will contribute to the prevention of intestine related diseases and an elimination of toxins. Once the amount of feces increases due to the ingestion of insolvable dietary fiber, the passage of feces becomes smoother and faster which will reduces pressure in the large intestine. Accordingly, it will be effective to prevent the development of colon diverticulosis that is a protuberance of the mucosae on the wall of the large intestine. The feces also adsorbs toxins in the large intestine to eliminate them from the body which will be associated with a decreased risk of developing colorectal cancer. These toxins that were generated in the intestines are possibly absorbed into the body and cause a liver ailment. Moreover, they are carried via the blood stream and reach to skin with providing adverse effects. An ingestion of dietary fiber contributes to relieve these symptoms.

Some people are concerned about dietary fiber absorbing and eliminating minerals from their body together with the toxins. This condition would only happen if you overconsumed dietary fiber. If your intake level is

within the range of the recommended daily allowance, it facilitates the absorption of minerals. Once the intestinal bacteria use dietary fiber, they produce acidic substances. Consequently, the pH level in the intestines decreases. The ingested minerals become solvable in low pH environment which in turn increase its absorption rate.

Effects of dietary fiber

1. Promotion of carbohydrate metabolism
2. Promotion of fat metabolism
3. Prevention of intestine related diseases
4. Enhancing skin conditions
5. Stimulating gastrointestinal motility
6. Immune stimulation
7. Elimination of toxins
8. Increasing mastication
9. Facilitating a mineral absorption

An ingestion of food including dietary fiber slows the rate of absorption of carbohydrates and fats. It is responsible for the elimination of toxins which will prevent toxins to reach to the liver and skin. It stimulates directly intestines and immune systems which will contribute to infection controls with pathogens and viruses.

◆◇ Intestinal bacteria produce short-chain fatty acids from dietary fiber

Dietary fiber provides a variety of benefits to our bodies once they were used as the nutrients of the intestinal bacteria. These food materials that can be nutrients of good bacteria in the intestines are called prebiotics. Oligosaccharides are common prebiotics that help to increase the numbers of bifidobacteria. Soluble dietary fiber also becomes a nutrient of good bacteria and they produce short-chain fatty acids including acetate, propionate and butyrate.

Recent studies have reported that these short-chain fatty acids improve intestinal conditions and researchers in the field of intestinal bacteria give considerable attention to them. The short-chain fatty acids have been documented about their beneficial effects on intestinal and systemic health: the proliferation of intestinal cells, enhancement of mineral absorption, the improvement of fat metabolism in the liver, the stimulation of bowel peristalsis and controlling obesity. Dietary fiber plays such a great role for our health through working directly in the intestines and cooperative functions from the intestinal bacteria.

◆◇ Luminacoids could be more important than dietary fiber

Nowadays, an idea of losing weight by skipping an intake of carbohydrates referred to as a carbohydrate restricted diet has been increasing in the market. Certainly, overconsumption of carbohydrates makes people obese. However, you should not ignore the fact that carbohydrates are a very important nutrient for intestinal health. The intestinal bacteria decompose not only dietary fiber and oligosaccharides, but also luminacoides that is the generic name of compounds which have a prebiotic effect and are undigested by the digestive enzymes of humans.

There is a compound in luminacoides that is more nourishing for intestinal bacteria than dietary fiber. This compound is resistant starch. Normally, starches are degraded into glucose by the digestive enzymes and

absorbed by the body to use it for sugar. Resistant starch is a type of starch but indigestible. It becomes nutrients of the intestinal bacteria which will produce many beneficial substances in the intestines like short-chain fatty acids.

Resistance starch is abundant in whole-grain cereal, pasta, green bananas and cold potatoes. Once heated starch cools down, its structure changes and resistant starch will occur. A familiar example of food including resistant starch is cold rice balls and potato salad. These are the reason why an excessive carbohydrate restriction cause adverse effects to the intestinal bacteria. Other than resistant starch, indigestible proteins are called resistant protein and abundant in Soba (buckwheat noodles) and Sakekasu (the lees left over from sake production). A decrease of an intake of dietary fiber is associated with a decrease of a grain consumption. The amount of dietary fiber in 100 grams of mushrooms, seaweeds or vegetables is higher than in 100 grams of grain. However, it is not easy to eat a lot of mushrooms, seaweeds or vegetables at once. Therefore, increasing an intake of grain together with vegetables is important in order to increase the intake amount of dietary fiber. We can effectively have more dietary fiber if you add more brown rice, mix barley with white rice or chose rye bread and whole-grain bread. You can achieve health from your intestines by adding good amount of dietary fiber and luminacoides in your daily meals.

Food ingredients including luminacoides

Types of luminacoides	Food ingredients
Resistant proteins	Soba (buckwheat noodles) , Sakekasu (the lees left over from sake production)
Sugar alcohol	Melons, pears, mushrooms, Miso, wine
Resistant starch	Whole-grain cereal, pasta, immature bananas, potato salad, cold rice balls
Soluble dietary fiber	Fruits, vegetables, konjac, seaweeds, oats, barley, burdock root, jerusalem artichoke
Insoluble dietary fiber	Fruits, vegetables, grain, soybeans, cocoa, peanuts, mushrooms, shells of crabs and shrimps