

THE BENEFITS OF FIBRE IN YOUR DIET

Dietary fibre is not a single entity. The term refers to many compounds, mostly complex carbohydrates. Nutritionists advise that 15 g to 30 g of fibre be eaten daily. This amount can be supplied by a slice of whole grain bread and two servings of fruit and vegetables. Tables giving the fibre content of food are available in most nutrition books.

Fibre is of considerable benefit in the digestive tract. For one thing, it attracts water to the digestive tract. In turn, the water softens the feces and prevents constipation. For another thing, it provides bulk to the food. As it moves through the digestive system, this bulk stimulates the muscles of the intestinal walls and reduces the risk of *diverticulosis*, a condition in which the intestinal walls are weakened and bulge out. As well, this movement of the bulk lessens the chances that bacteria will infect the appendix and cause appendicitis. Furthermore, because it speeds up the passage of food through the digestive tract, fibre reduces the time during which the lining of the digestive tract is exposed to potential cancer-causing agents in the food. Still another benefit of fibre is its ability to bind cholesterol, a fatty substance. The cholesterol does not enter the blood and is eliminated in the feces. The level of cholesterol in the blood is thus moderated. High blood cholesterol levels have been linked to *atherosclerosis* (blockage of arteries by fatty deposits).

Fibre is not without its harmful effects. It carries water out of the body and can cause dehydration. It also reduces the absorption of iron and minerals such as calcium. Thus, moderate intake of fibre is advisable.

Questions:

1. What is dietary fibre?
2. How much fibre do nutritionists advise should be eaten daily?
3. What types of food contain fibre?
4. List five benefits of fibre in your diet.
5. List two harmful effects of excessive fibre in your diet.

DISEASES THAT ATTACK THE DIGESTIVE SYSTEM

The Esophagus

Heartburn is a burning sensation, created by the action of gastric juices, in the lower part of the esophagus. The cardiac sphincter normally remains closed unless a person is swallowing food or drink. However, a violent release of gas from the stomach (a large "burp") will cause the cardiac sphincter to open and can allow some of the very acidic gastric juices to be released into the esophagus. The esophagus is not as thickly coated with protective mucus as is the stomach, so the burning sensation that results is due to the acidic gastric juices "eating away" at the unprotected esophageal lining. It is referred to as *heartburn* because the burning sensation is felt in the part of the chest where the heart is located.

Hiatal hernia involves the opening (or *hiatus*) in the diaphragm through which the esophagus passes on its way from the chest cavity into the abdominal cavity. In a hiatal hernia, part of the stomach protrudes through the esophageal hiatus into the chest cavity. This condition often causes severe discomfort after eating, and may have to be corrected surgically.

The Stomach

In the simplest terms, an *ulcer* is a crater-like depression in the lining of the digestive tract. Ulcers in the stomach are called *peptic ulcers*, while those of the duodenum are called *duodenal ulcers*. If acid production in the stomach is increased, or mucus production is reduced (or non-existent), the acid will eat away the cells lining the tract to produce an ulcer. The causes of ulcers are often unknown, but may be related to stress or to diet. Heredity may also play a part in whether a person is prone to develop ulcers. Recent research indicates that some ulcers are caused by the presence of a certain type of bacteria, and so can be treated with antibiotics that kill the bacteria.

Ulcers are often very painful. A victim of ulcers can gain some relief from the pain by taking antacids and by eating very bland foods. The underlying cause of the ulcer must be determined before treatment can be successful.

The Liver and Gall Bladder

Cirrhosis, a serious liver condition, is most commonly caused by the consumption of large quantities of alcohol over a long period of time. It can also be caused by poor diet or by an infection leading to hepatitis.

The symptoms are the same regardless of the cause. They include nausea, weight loss, general weakness and abdominal pain (and sometimes abdominal swelling). Since these symptoms are common to many other conditions, careful testing is needed to determine if cirrhosis is the cause. These tests include X rays, blood tests, a general physical examination and a minor operation (called a biopsy) where a small sample of liver tissue is removed and examined microscopically.

Treatment for cirrhosis includes maintaining a well-balanced diet which is rich in vitamins and protein, plenty of rest and abstinence from alcohol. Given the chance, the liver can repair itself, but the process takes a long time.

Hepatitis is another disease of the liver. It can be caused by a variety of agents, including bacteria, viruses, parasites, alcohol or drugs. Symptoms of the disease include an inflammation of the liver itself, considerable pain in the abdominal region, and jaundice. The skin of a person suffering from jaundice has a pale yellow colour. This is caused by higher than normal levels of certain fatty chemicals in the blood.

Depending on the cause and severity of the disease, the treatment for hepatitis varies. Most patients recover completely (except in the case of Hepatitis B, which is caused by a virus that remains within the cells forever).

As the name suggests, *gallstones* are associated with the gall bladder. The gall bladder acts as a holding tank for bile salts which are produced in the liver. Over a period of time, a stone consisting of bile pigments and calcium salts can develop in the gall bladder. If this stone becomes stuck in the neck of the gall bladder, it can prevent the bile from passing down the duct to the small intestine. If the stone is small enough, it can be carried along with the bile to the small intestine and out of the body. However, if the stone becomes stuck and does not move, an operation is often needed.

The Pancreas

The pancreas is an organ with several different functions. Some cells of the pancreas produce a number of enzymes and other chemicals that are released into the small intestine to aid in digestion. Other cell types are important in the metabolism of sugar in the body and in maintaining blood sugar levels. The hormone insulin is produced in small groups of specially modified glandular cells in the pancreas (known as the islets of Langerhans). The failure of these cells to secrete sufficient amounts of insulin causes *diabetes mellitus*. Without insulin, glucose in the blood cannot enter the cells, and the body cannot use it for energy. The excess glucose remains in the blood, and is then removed by the kidneys.

There are several types of diabetes: type I diabetes, which requires total insulin replacement in order to live; type II diabetes, which is related to insulin resistance, obesity, high cholesterol, and high blood pressure, and is often controlled through diet, and gestational diabetes, which occurs during pregnancy and is usually temporary.

Pancreatic cancer is the fifth leading cause of cancer death around the world. Its incidence cuts across all racial and socio-economic barriers, and is nearly always fatal. Despite the continued diligent efforts of the medical community, it is estimated that 25,000 people may die from this disease each year in Canada.

The Appendix

The appendix is a blind tube extending from the caecum of the large intestine. Food material sometimes gets lodged in the appendix, where conditions are favourable for the growth of disease-causing bacteria. If these bacteria infect the appendix, they can cause *appendicitis*, which is an inflammation and swelling of the appendix. Under such conditions, surgical removal of the appendix may be necessary. If not so removed, the infected appendix may burst, releasing the infective bacteria into the abdominal cavity. *Peritonitis*, which is an inflammation of the body cavity surrounding the appendix, will result. This condition is very serious and can be fatal if left untreated.

QUESTIONS

1. Describe (in detail) how *heartburn* arises.
2. Describe the condition of a *hiatal hernia*.
3. a) What is an *ulcer* and how does it develop?
b) What are the main causes of ulcers, and how are they treated?
4. Describe the causes, symptoms, detection and treatment of *cirrhosis* of the liver.
5. Describe the causes and symptoms of *hepatitis*.
6. a) What is a *gallstone* and why is it dangerous?
b) How are gallstones dealt with?
7. a) What occurs in *diabetes mellitus*?
b) Name and compare the 3 main types of diabetes.
8. What are your chances for survival if you have *pancreatic cancer*?
9. a) What is *appendicitis* and how does it arise?
b) How is *appendicitis* treated?
c) What is *peritonitis* and why is it dangerous?