



Monosaccharides and Polysaccharides Source, Their Function is the Digestion and Intracellular Exchange of Carbohydrates Contained in Food

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Annotation

Monosaccharides and polysaccharides together with proteins and lipids are important chemical compounds for living organisms. The main source of carbohydrates is carbohydrates in food, which is mainly in the form of starch. For example, in bread products, leguminous plants, fruits and vegetables, sugar products.

Keywords: starch, sucrose, glucose, triose, pentose, ribose, oligo 1-6 glucosidase, amylo 1-6 glucosidase, maltose, sucrose, lactose, galactose.



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Carbohydrates are organic substances widely distributed in nature and make up 70-80% of the dry weight of plant bodies and about 2% of human and animal bodies. Carbohydrates perform very important functions in the human body, even though they are very small in quantity:

ENERGY FUNCTION - carbohydrates are the main source of energy for the human body, because approximately 60% of the energy required for the normal development of the body is generated from the breakdown of carbohydrates in the body. Glucose is the main source of energy for brain activity.

STRUCTURE FUNCTION—carbohydrates are part of cell membrane, nucleic acids, coenzymes, complex proteins, connective tissue, etc.

PROTECTIVE FUNCTION - carbohydrate-rich soy and other mucous secretions from various mechanical injuries of the inner walls of the esophagus, stomach, intestines, bronchial tubes; protects against the entry of pathogenic bacteria and viruses.

CONTROL FUNCTION - the complex carbohydrates in the food have a mechanical influence on the intestinal tract and increase peristalsis. Therefore,

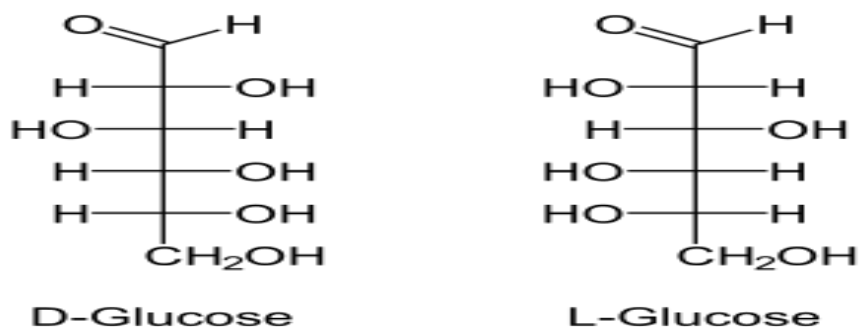
when constipation is observed, it is recommended to eat black bread with a lot of fiber.

FUNCTION OF SPECIFICITY - ensuring the specificity of blood groups of some representatives of carbohydrates: production of antibodies; participates in important processes such as transmission of nerve impulses.

RESERVE NUTRIENT FUNCTION - starch (in plants) and glycogen (in animals and humans) are reserve nutrients.



Monosaccharides are non-hydrolyzable (simplest) carbohydrates, including: trioses (with 3 "C") - 3-phosphoglyceraldehyde; tetrose (with 4 "C") - erythrose; peptoses (with 5 "C") - ribose, deoxyribose; hexoses (with 6 "C") - include glucose, fructose, galactose. Triose, tetrose, peptoses are basically the result of complete breakdown of glucose. Among the monosaccharides, glucose is an aldehyde alcohol that is widespread in nature and is the main component of disaccharides and polysaccharides. In addition to glucose, monosaccharides such as fructose and galactose are also found in the body of animals and humans in a free state, mainly in di- and polysaccharides. Monosaccharides have the ability to be oxidized, resulting in a 6-atom alcohol (for example, when D-glucose is reduced, a 6-atom alcohol - sorbitol is formed). Carbohydrates have such an important property as phosphorylation in the body, and their phosphorous esters play an extremely large role in metabolism. For example, hexozomonophosphate (glucose phosphate, fructose phosphate); hexose-diphosphate (fructose-1,6-diphosphate). Monosaccharides also form amino acids; in which one of the hydroxyl groups in the monosaccharide is replaced by the H,N-group. These amino sugars are mainly included in monopolysaccharides.



Disaccharides: sucrose (composed of glucose and fructose), lactose (composed of glucose and galactose); maltose (from two molecules of glucose) is included.

According to their structure, polysaccharides are divided into homopolysaccharides and heteropolysaccharides. Homopolysaccharides include glycogen, starch, cellulose, and cellulose. They are biopolymers composed of glucose residues. Such polysaccharides are called homopolysaccharides because they contain the same monosaccharide. Heteropolysaccharides (mucopolysaccharides) are composed of monosaccharides and their products and are divided into 2 depending on their composition: a) mucopolysaccharides with acid properties; b) neutral mucopolysaccharides. consumption of monosaccharides should be 15-20% of total carbohydrates. For the normal functioning of the brain, the daily need for monosaccharides is 160 - 180 g, which is a quarter of all carbohydrates consumed with food (300-500 g per day). For example, if a portion of honey is consumed, then sweets v Polysaccharides and disaccharides are digested in the

gastrointestinal tract and turn into monosaccharides. Digestion begins in the oral cavity under the influence of amylase and maltase enzymes in saliva, and the main digestion takes place in the duodenum and the initial part of the small intestine (pH 8-9). There are no carbohydrate-degrading enzymes in the stomach. Enzymes of amylase, sucrose, maltase, lactase, amylo-1,6-glucosidase, which ensure the digestion of carbohydrates, are developed in the mucous membrane of the pancreas and small intestine. Fiber (in the gastrointestinal tract) is not digested and promotes stool formation. Monosaccharides (mainly in the form of glucose) are absorbed into the blood (against the concentration gradient) through the microvilli in the epithelium of the small intestine with the consumption of ATF. (When carbohydrates are consumed in excess with food, a small amount of sucrose and lactose can be absorbed. But they are not used in the body, they are excreted through urine). Glucose with the blood goes to the liver, and a certain amount of it is converted into glycogen, and the main amount is delivered to the cells of all tissues with the blood. The amount of glucose in the blood is normal (in the blood of healthy people) 70-120 mg % (or 3.6-6.1 mmol/l according to "CI").

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