Proteins in the diet

Proteins are macromolecules composed of AMKs linked by a peptide bond. Essential AMKs include: isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, valine; for children and histidine. Full-value proteins with the highest biological value are those that contain all the necessary AMK - these are animal proteins, from plant proteins they are yeast and soy proteins. Proteins of plant origin are mostly incomplete proteins and their biological value is determined by a limiting (deficient) essential amino acid (eg lysine in wheat flour). However, protein sources can be combined so that the organism is optimally saturated with all AMK.

Function

Their function is to build new and restore degraded cell structures. They are part of enzymes , hormones , genetic structures and defenses and an important source of nitrogen . The supply of protein to the body should be such as to maintain a balanced nitrogen balance . In addition to the basic building function in the protein molecule, each AMK also has its specific function in the organism - eg methionine and cysteine as carriers of the methyl group are used in the synthesis of a number of functionally important substances in the organism - glutathione (detoxification processes), choline (liver protection). , phenylalanine and tyrosine (synthesis of adrenaline, thyroxine, pigment).

Metabolism

Proteins are cleaved by proteolytic E, individual AMKs are used to produce proteins in the body or are further degraded by decarboxylation, transamination, deamination. These metabolic products are then incorporated into the overall biochemical processes of the organism and used for specific purposes according to the nature of AMK.

Physiological requirements

An optimal intake of 0.7 - 1 g / kg of ideal body weight seems to be with about 50% animal protein and 50% vegetable protein. The specific need is influenced by age, health and physiological condition (childhood, pregnancy, lactation, convalescence, higher physical activity). The minimum supply of protein, which is still enough to ensure the basic life processes of the organism, is 0.5 - 0.6 g / kg of weight.

Deficiency

1. Protein malnutrition (kwashiorkor) with long-term protein deficiency and relative excess of carbohydrates - especially in a growing organism. KO: swelling , muscle atrophy , psychomotor changes;
2. disruption of immune processes;
3. insufficient growth or renewal bb. and tissues;
4. impairment of enzyme synthesis and function;
5. changes in the biotransformation of xenobiotics;
6. insufficient synthesis of glutathione;
7. influencing hormonal activity;
8. disruption of spermatogenesis ;
9. increased oncogenic risk of choline and methionine deficiency.

Excess

An excess of 1.6 g / kg ideal weight is considered to be in excess:

1. products of metabolism of unused AMK (eg biogenic amines - histamine, tyramine, serotonin, as decarboxylation products) can be toxic or they can also interfere with the process of oncogenesis (putrescine, cadaverine or activated forms of heterocyclic amines formed by heat treatment of food);
2. amino acid residues degraded by ketogenesis may be involved in increasing endogenous cholesterol levels (animal proteins have higher hypercholesterolemic effects than plant proteins);
3. protein grafts can be precursors of nitrosation reactions leading to the formation of carcinogenic A-nitroso compounds (nitrosamines, nitrosamides);
4. high protein consumption stimulating effect on division and proliferation bb. may support the promotional phase of the carcinogenic process by excessive production of eg cadaverine and putrescine in the small intestine ;

5. Excess animal protein is usually always accompanied by an unnecessarily high intake of fats (meat, meat and dairy products) with all the risks.

References

Related articles

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- Minerals in food
- Trace elements in food
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- Nutritional recommendations
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References

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