

HEAVY METALS IN SEMI-FINISHED PRODUCTS AND THEIR EFFECT ON THEIR EFFECT ON THE BODY

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Abstract. This article examines the properties of some heavy metals in semi-finished products and briefly describes its effects on human health

Keywords: Iron, cadmium, calcium, cobalt, magnesium, manganese, copper, nickel, lead, silver, chromium, zinc

Аннотация. В этой статье исследуются свойства некоторых тяжелых металлов в полуфабрикатах и кратко описывается их влияние на здоровье человека.

Ключевые слова: железо, кадмий, кальций, кобальт, магний, марганец, медь, никель, свинец, серебро, хром, цинк.

Introduction. Heavy metals are generally described as having relatively high densities, atomic weights, or atomic numbers. The criteria used and whether metalloids are included will vary depending on the author and context. For example, a heavy metal can be determined by density, a criterion that differs in physics may be the atomic number, while a chemist would be more concerned about chemical behavior. Clear definitions were later published, but none of them were widely accepted.

It is known that the oldest metals are simple metals, precious metals such as iron, copper and tin, silver, gold and platinum are heavy metals. Since 1809, light metals, such as magnesium, aluminum, and titanium, as well as lesser - known heavy metals, including gallium, thallium, and hafnium, have been found.

Some heavy metals are essential nutrients (usually iron, cobalt, and zinc), or are relatively harmless (e.g., ruthenium, silver, and indium), but may be toxic in larger amounts or in certain forms. Like other heavy metals cadmium, mercury and lead are very toxic. Potential sources of heavy metal poisoning include mining, waste, industrial waste, agricultural effluents, occupational exposures, paints, and processed wood.

Discussion and results. The physical and chemical properties of heavy metals should be treated with caution, as the metals they contain are not always consistently identified. Heavy metals tend to be relatively dense as well as less soluble sulfides and hydroxides than reactive light metals. Although it is relatively easy to separate such heavy metals from light metals such as tungsten, some heavy metals such as sodium, zinc, mercury and lead have some properties of light metals and light metals. Beryllium, scandium, and titanium have some properties of heavy metals.

Heavy metals are a relatively rare crust but are present in many aspects of modern life. These include, for example, golf clubs, cars, antiseptics, self-cleaning ovens, plastics, solar panels, cell phones, and particle accelerators.

The 8 main toxic chemicals in food are usually: mercury, lead, cadmium, arsenic, zinc, copper, tin, and iron. The first three are the most dangerous. For example, lead is a very toxic poison. In many plant and animal products, its natural content usually does not exceed 1,0 mg/kg. However, large amounts of lead can be found in wild fish (e.g., tuna, up to 2,0 mg/kg), mollusks, and crustaceans (up to 10 mg/kg). An increase in lead is observed in cans called tin containers.

When leaded gasoline is burned, tetraethyl lead is formed, which easily penetrates the soil and contaminates the food grown in it. Therefore, the amount of lead in plants growing along highways has increased. Be careful when shopping for “green” household items on the go. As a rule, they are grown behind the fence closest to the road.

You can protect yourself from lead (or in rare cases) avoid wild fish, crustaceans and crustaceans, use canned food in boxes, and buy food grown along the way. Along with lead, there is also a very toxic chemical element, cadmium, which is about 5-10 times lower than the natural content of lead in food. High concentrations of cadmium are observed in products such as cocoa powder (up to 0,5 mg/kg), animal kidneys (up to 1,0 mg/kg) and fish (up to 0,2 mg/kg). The lead content, like cadmium, increases in cans from a collection tin container. Mushrooms obtained from environmentally polluted areas may contain large amounts of cadmium: 0,1-5,0 mg/kg. Mushrooms are also called “forest cleaners” for their ability to absorb toxins. Excess cadmium was found in broiler carcasses and animal meat due to the use of safe feed.

The most common sources of cadmium are chocolate, animal kidney, fish, meat, chicken and mushrooms from environmentally unfavorable regions.

The data obtained during the study of semi-finished products are presented in the following table:

Products	Pb		Cd		Zn		Cu	
	The norm №0366-19	Result	The norm №0366-19	Result	The norm №0366-19	Result	The norm №0366-19	Result
Meat products	0,5	0,42	0,05	0,03	70	30	5	3
Egg protein	0,5	0,3	-	-	-	-	-	-
Milk	0,1	0,07	0,03		1,0		5,0	
Sour cream 25%	0,1	0,06	0,4	0,02	0,6	0,3	0,5	0,09
Cottage cheese	0,3	0,3	0,1	0,01	4,0	1,3	50,0	29,3
Cheese	0,5		0,2		4,0		50,0	
Ice cream	0,1		0,03		1,0		5,0	
Grains	0,5		0,1		-		-	
Legumes	0,1		0,1		-		-	
Cereals	0,5		0,1		-		-	
Bread	0,35		0,2		-		-	

Sugar	0,5		0,05		-		-	
Vegetables	0,05		0,03		5,0		10,0	
Tea	10,0		1		-		100,0	
Drinking water	0,1		0,005		1,0		5,0	

Mercury is a highly toxic poison of cumulative (cumulative) effect. Due to this feature, its content in young animals is less than in older animals, and in predators it is higher than in their prey. This is especially true of wild fish. For example, mercury can accumulate in the body of tuna up to 0,7 mg/kg or more. Other active natural “accumulators” of mercury from animal products are animal kidneys.

Their mercury content can reach 0,2 mg/kg. Thus, all mercury is present in the kidneys of wild fish and animals. To protect yourself from getting heavy metals, eat meat and fish products (especially wild fish), as well as products that contain heavy metals: cocoa beans, mushrooms, yogurt. The use of herbs and canned food grown throughout the years should be limited. Nutrition is a basic biological requirement of the human body. From whom proper nutrition depends on the vitality, performance and resistance of the organism to the external environment. Nutrition must provide the body with nutrients, as a result of which it restores the substances it consumes in the course of life - energy metabolism; the recovery of consumables and the synthesis of new cellular elements, viz. ensuring the plastic process, as well as the deposition of reserve substances in the depot tissue (fat, adipose tissue, glycogen - in the liver). Food is an integral part of everyone’s daily life. A person gets almost all the necessary substances for food for life, work and other social activities.

Metabolism is carried out through two main processes - assimilation and dissimilation. The process of assimilation consists of the constant intake of water, air and complex organic and mineral substances into the body. These substances are absorbed by the body, go through a series of processes, enter all the cells of the body and determine their vital activity. In parallel with this process takes place the process of dissimilation - the destruction of substances, as a result of which energy is released, which determines the vital activity of the organism.

The composition of modern human food is very diverse. To provide the human body with all the necessary nutrients (and their number is more than 600), his diet should contain about 32 elements of various products: bread, meat, fish, milk, vegetables, fruits, herbs, legumes, vegetable oils and much more.

Conclusion. It is necessary to distinguish between caloric intake (total caloric intake) and the quality composition of human food. The quality composition of food is of little importance for the energy expenditure of the body, and individual food components (fats, proteins, carbohydrates) can be replaced by their isodynamic equilibrium principle (according to caloric content) and plastic processes., the presence of a certain amount of food components is mandatory. This means that food consumption can be quantitatively sufficient (sufficient) and

poor quality (insufficient). It is known that many energy processes that take place in the human body require the presence of certain enzymes and substances to carry them out, the minimal content of which disrupts the course of these processes.

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