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RESEARCH OF FOOD SAFETY OF CERTAIN TYPES OF OIL-ANDFAT PRODUCTS

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Assessment of content of chemical components affecting the food safety of vegetable oils and margarine products has been carried out.

Keywords: oils and margarines, chemical components, food safety

Improving the quality and ensuring food safety of food modified fats is carried out by effective methods of catalytic modification using catalytic systems with increased selectivity and reduced isomerizing ability [1-3].

The production of catalytically modified edible fats and their use for the preparation of margarine products and high-solid confectionery fats improves the quality and food safety of products based on them [4, 5].

The most scientifically substantiated is the selection of technology for the production and catalytic modification of cottonseed oil using highly selective catalysts based on nickel, copper and promoting additives that reduce the content of trans-isomerized fatty acids in lard, as well as the ability to control the location of fatty acids in triglycerides of dietary fats [6 - 8].

The selection and establishment of optimal technological regimes for the production of catalytically modified edible fats make it possible to ensure high quality and food safety of consumer fats obtained on their basis [9–10].

Determination of physico-chemical parameters, fatty acid composition and arrangement of fatty acids in triglycerides of cottonseed oil allowed us to determine

science-based methods for the production of catalytically modified fats with high quality and increased food safety.

The production of benign and shelf-stable consumer fats largely depends on strict adherence to sanitary and hygienic requirements and food safety.

The quality of oil and fat products was determined by a sample taken from a homogeneous batch of the product in accordance with the requirements of the current standard on the rules and methods of sampling. During the examination of quality and food safety, the organoleptic indicators normalized by the standards were evaluated.

The data obtained confirmed that the content of toxic elements (lead, arsenic, cadmium, mercury, copper, iron), mycotoxins, pesticides and radionuclides did not exceed the levels specified by the hygienic requirements for the quality and safety of food raw materials and food products (SanPiN).

The main indicators reflecting the degree of oxidative deterioration of oils - peroxide and acid numbers in accordance with the requirements of SanPiN did not exceed the following levels: peroxide number - no more than 10 mmol active oxygen / kg, acid value - no more than 0.6 mg KOH / g.

Examination of the quality and food safety of margarine products included identification, detection of falsification, as well as the determination of safety in terms of safety indicators.

When identifying, the correspondence of margarine to its assortment was established. The identification of margarine makes it possible to distinguish it from butter.

When carrying out qualitative identification, the compliance of the product with the requirements of the current regulatory documentation was established, and the degree of freshness of the product was also determined.

According to the current documentation, the organoleptic, physicochemical, microbiological indicators

of the quality of margarine, as well as their safety indicators, were evaluated.

The taste, smell, texture and color of margarines were evaluated.

The mass fraction of moisture, fat, salt, acidity and melting point of fat isolated from margarine were also determined.

Microbiological indicators and safety indicators were established in accordance with the requirements of the current SanPiN.

A generalized analysis of hygienic indicators and food safety of experimental samples of oil and fat products was carried out. The results of the analyzes are shown in table.1.

Tab1

Hygienic indicators and food safety of experimental samples of oil and fat products

Indicator	Maximum permissible content, mg/kg	According to the assessment of the hygiene laboratory. mg/kg
Lead	0,1	No
Cadmium	0,05	No
Arsenic	0,1	No
Mercury	0,05	No
Copper	1,0	0,03
Zinc	5...10	No
Mycotoxins	Unacceptable	No
Pesticides	Unacceptable	No
Nitrates	1,5-2,0 mg/l	0,03...0,07
Nitrosamines	0,80-100 mkg/kg	No
Polycyclicaromatichydrocarbons	to 0,5 mkg/kg	No
Antibiotics	Unacceptable	Unacceptable

From the data given in Table 1, it follows that in the experimental samples of oil and fat products, individual indicators are lower than the values established by the regulatory documentation. This justifies the increase in its consumer level.

The quality of vegetable oils was determined by a sample taken from one batch of the product in accordance with the requirements of GOST 52062-2003 on the rules and methods of sampling.

At the first stage of the examination, the quality of vegetable oils was assessed according to organoleptic indicators normalized by the standards in order to identify the type of oil.

However, only an organoleptic evaluation is often not enough to identify an oil, especially for refined oils that are impersonal in taste and smell, as well as in the case of falsification of oils by adding cheap ones to expensive oils, such as olive oil. In these cases, the fatty acid composition was determined for the studied product, which is specific for each type of oil.

To assess the quality of oils, the main physical and chemical indicators were determined, normalized by GOSTs and TUs.

For all vegetable oils, the content of toxic elements, as well as mycotoxins, pesticides and radionuclides did not exceed the required levels, standardized by SanPiN 2.3.2.1078-01; microbiological indicators for most vegetable oils are not regulated (Table 2.)

table 2

VegetableOilSafetyIndicators

Indicator	Acceptablelevel, nomore	Note
Acid number, mg KOH/g	4,0	Unrefined
	0,6	Refined
Peroxide number, mmol 1/2 O/kg	10,0	
Toxic elements, mg/kg:		
lead	0,1	
	0,2	peanutbutter
arsenic	0,1	
cadmium	0,05	
mercury	0,03	
Mycotoxins	0,005	Unrefined
(aflatoxin B), mg/kg		
Pesticidesmg/kg:	0,2	
hexachlorocyclohexane	0,05	Refinedanddeodorized
(α -, β -, γ - isomers)	0,2	
DDT anditsmetabolites	0,1	Refinedanddeodorized
Radionuclides, Bc/kg:	100	
cesium-137	50	
strontium-90	500	Sunfloweroil
Kmafanm**, CFU/g***, no more	100	Corn
	Not allowed	
BGKP***** (coliforms), in 1 g of the product	Notallowed	
Pathogenic 1 microorganisms,		

including salmonella, in 125 g of the product	Notallowed	
Yeast, in 1 g of product	100	Sunfloweroil
	20	Corn

In the market for the consumption of vegetable oils, sunflower oil is the most popular (55% of the consumption of all vegetable oils).

Since margarine is a complex multicomponent system containing a water-milk phase, which can be affected by various groups of microorganisms, its microbiological indicators are assessed:

When preservatives are added, their mass fraction in margarine should be, %, not more than 0.1 ± 0.02 benzoic acid or sodium benzoate; 0.06 ± 0.01 sorbic acid

Thus, the study of the food safety of vegetable oils and margarine products made it possible to determine the content of chemical constituents that affect the nutritional value and safety of oil and fat products.

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