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ASPECTS OF FORENSIC COMMODITY EXPERTISE OF CHEESES AND ESTABLISHING THEIR FALSIFICATION

Dairy products occupy an important segment of the market in international trade. Trade in cheeses is especially popular and promising. Cheese is a highly concentrated dairy product, therefore, the yield of the finished product during its manufacture is relatively small: about 10-12 liters of milk are needed to produce 1 kg of cheese, and approximately 0.25 tons of 82.5% butter or 0.60 tons of cheese can be obtained from 1 ton of milk. These facts encourage unscrupulous manufacturers to falsify dairy products. The volume of counterfeits has now doubled. Dairy products belong to potentially dangerous food products for human health. In case of improper production technology, packaging, storage and transportation, they are easily perishable. Thus, there is a special relevance of assortment and information identification of dairy products, in particular, cheeses.

It is possible to determine the criteria for the authenticity of cheeses in the case of the most typical falsifications: when reducing nutritional value, the criteria for authenticity are the mass fraction of fat, the mass fraction of protein, the composition of mono- and disaccharides; when using non-dairy types of raw materials, and adding vegetable oils, the criteria for authenticity are the fatty acid composition of the fat part of the product, the quantitative content of β-sitosterols, campesterol, stigmasterol and brassicasterol; when faking protein nitrogen with melamine, the criterion for authenticity is the absence of melamine; when changing the species properties of products, the criterion for authenticity is the composition of organic acids.

Assortment identification is carried out primarily according to organoleptic, physicochemical indicators. For this identification, general criteria for the entire group of dairy products and specific criteria for each subgroup or type of product are used. Appearance, smell, taste and texture belong to general organoleptic indicators, and the mass fraction of fat and fatty acid composition belong to general physicochemical indicators [1].

Falsification by partial substitution of milk fat with refined oil, and milk protein with soy protein does not always allow to reveal the taste and smell. Based on this, it is advisable to study the fatty acid composition of cheese when using the organoleptic method. Determination of this indicator is also used in the assortment identification of cheese [2]. The pattern on the cheese cut is a standardized name of its internal structure, it belongs to the essential characteristics, types, types, subtypes and names of the goods in this subgroup. The presence of mold or mucus is one of the identifying features of certain types and names of cheeses.

Quantitative falsification is achieved by underweight of non-packaged and packaged goods; it can be subjective or objective in nature. In case of technological falsification by replacing a part of milk with the required fat content with skimmed milk, the fat content of cheeses decreases [3]. In case of information falsification of dairy products, names close to natural products are used to designate them, for example, "Tvorogok", "Syrochok". A common way of cheese falsification is to replace milk fat with vegetable fat. The most common problem faced in the classification of cheese is the prevalence of such a product as cheese product - this is cheese with vegetable fat, a milk-containing product made in accordance with the cheese production technology [4].

To protect consumers from low-quality and falsified food products, the Law of Ukraine "On the Quality and Safety of Food Products and Food Raw Materials" is in effect [2, 5]. If the cheese manufacturer establishes a longer shelf life than indicated in the sanitary and epidemiological rules and regulations (SanPiN), it is obliged to justify it by conducting a series of laboratory tests at the stages of product storage.

Requirements regarding food safety, including cheese, are outlined in the Law of Ukraine "On Information for Consumers Regarding Food Products" (as amended). This document requires manufacturers to indicate on the front side of the consumer packaging whether milk fat was replaced with vegetable fat during the production of this product. If it was replaced, it will no longer be a milk-based product, but a milk-containing product with a milk fat substitute. In the labeling of cheese, it is necessary to indicate the type of main starter microflora, as well as the nature of the origin of milk-clotting enzyme preparations (DSTU 6003:2008) [6].

According to the requirements of the State Standard for cheese DSTU 6003:2008, any packaged cheese product must contain the following information: cheese name; name and full address and telephone number of the manufacturer, address of production facilities; net weight, g or kg; cheese composition in order of preference of the ingredients used during its production; nutritional and energy value (caloric content) indicating the amount of fat and protein in established units of measurement per 100 g of cheese; fat content in dry matter, %; final consumption date "Best before..." or production date and shelf life; production batch number (except for consumer packaging); storage conditions; barcode according to DSTU 3147; standard designation.

Difficulties also arise with cheese identification for customs classification purposes. To reduce their customs payments, suppliers both reduce the quality of products and try to assign them incorrect HS codes – a goods classifier used by Ukrainian customs [7]. When classifying goods according to the HS, customs authorities make classification decisions, preliminary decisions, or provide clarifications. Decisions on the classification of goods according to the HS are made by customs authorities in cases of detection of incorrect goods classification.

In case of detection of signs of incorrect goods classification before their release, or if the declared information is not confirmed accordingly, the customs authority has the right to conduct an additional verification. In this case, it may appoint a customs expertise or request additional information/documents. The customs authority immediately informs the declarant about the need to provide additional information or documents.

For the classification of cheese in the HS, commodity position 0406 "Cheese of all kinds and sour milk cheese" is provided. Group 04 "Milk and milk products; bird eggs; natural honey; edible products of animal origin, not specified elsewhere" includes cheese from cow's milk, in brine containers, products obtained by concentrating whey with the addition of milk or milk fat.

The classification of cheese in position 0406 according to the HS is based on the following features: 1. Production technology and degree of ripening (fresh – 0406 10, grated – 0406 20, processed – 0406 30, blue – 0406 40, others – 0406 90), as well as type; 2. Fat content; moisture content; 3. Raw materials (cow's, sheep's, goat's, buffalo milk).

The purpose of customs expertise of cheese is to determine the indicators that allow unambiguous classification of the goods according to the HS. Such identification indicators are classification features, namely the production technology and type of cheese, fat content and moisture content, origin of raw materials, and value, which are subject to determination

during the customs expertise. As a rule, when appointing expertise, customs authorities address these very issues to experts. Cases of incorrect determination of the classification code from the HS are very common. This is mainly due to the fact that declarants do not have the necessary skills and knowledge, or it happens by mistake. To achieve the goal of cheese identification and answer the questions of customs authorities, experts conduct research using various methods. Using organoleptic methods, the expert determines the type and production technology. Based on physico-chemical studies, the chemical composition, raw materials, the presence of falsification (the presence of additives of non-dairy origin, for example, vegetable oils), the degree of maturity, etc. are determined [5].

During the customs expertise, the expert is guided by regulatory documents, standard and recommended research methods, uses the terminology of regulatory documents, the HS, as well as terminology accepted in the industry.

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