

CURRENT PROBLEMS OF STUDYING THE PROPERTIES OF MILK FATS OBTAINED FROM LARGE AND SMALL HORNED ANIMALS

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Annotation. This article covers the current issues of studying the physicochemical and biological properties of milk fats obtained from large and small horned animals. The composition, quality and problems encountered in the technological processing of milk fat are currently scientifically analyzed. Also, the influence of environmental factors, animal nutrition and breed characteristics on the quality of milk fat is studied. The article also develops scientific and practical recommendations for improving the quality of dairy products.

Keywords: milk fat, large horned animals, small horned animals, quality, composition, environmental factors, technology.

Milk is one of the most important biological products in human nutrition, which contains protein, fat, carbohydrates, minerals and vitamins. Milk fat is the most important energy component of milk and is of particular importance in human health, the digestive system and metabolic processes. Currently, the study of the composition, quality and technological properties of fats obtained from the milk of large (cow, bull) and small horned animals (goat, sheep) is one of the important scientific directions in the food industry, biotechnology and veterinary medicine.

In recent years, it has been found that the quality indicators of milk fat are significantly affected not only by the genetic factors of the animal breed, but also by their nutrition, environment, quality of care and environmental conditions. Therefore, an in-depth study of the physicochemical composition of milk fats, improvement of their processing technology and strengthening of quality control are among the urgent issues of modern science.

Milk fat has a complex chemical composition, which mainly consists of triglycerides, phospholipids, sterols, fatty acids and fat-soluble vitamins (A, D, E, K). Triglycerides make up the main part of milk fat (96–98%). Their molecules are ester derivatives of various fatty acids with glycerol, which affect the physical properties of these fats, such as melting point, viscosity and taste.

The proportion of unsaturated fatty acids in milk fat of large-horned animals is relatively small, consisting mainly of palmitic, stearic and myristic acids. In the milk of small-horned animals - sheep and goats, unsaturated fatty acids, including oleic and linoleic acids, are more common. Therefore, goat and sheep milk fats are characterized by easy digestibility and high biological activity.

Cow milk fat is the most common in human nutrition, its average fat content is around 3.5–4.0%. Sheep milk has a fat content of 6–8%, which is higher in terms of energy. Goat milk is

characterized by 4.5–5% fat. However, qualitatively, goat milk fat globules are smaller, which makes them easier to digest.¹

Milk fats of small-horned animals have a specific taste, smell and creamy color. The caprylic, capric, capric acids in their composition give goat milk fat a specific aroma. This characteristic gives cheese, yogurt, and other fermented products made from goat's milk their uniqueness.

The study of the physicochemical properties of milk fats today poses a number of problems. The main ones are:

The influence of environmental factors. The habitat of animals, the quality of water and feed affect the amount of toxic substances in the fat. This can negatively affect the safety of milk fat.

Genetic factors. The genetic characteristics of cows, sheep and goats of different breeds determine the amount and composition of their milk fat. However, not enough research has been conducted on local breeds in this regard.

Technological problems. During milk processing, high temperatures, mechanical mixing and low-temperature storage conditions change the physical state of fats. This leads to a violation of the natural structure of the fat.

Limited laboratory facilities. Many regional laboratories do not have enough modern chromatographic equipment to determine the spectrum of fatty acids. This limits the quality of scientific research.

In particular, chromatographic analysis clearly shows the differences between cow, sheep and goat milk fats. Also, using the infrared spectroscopy method, the energy absorption bands of fats are determined, and this method can be used to check the naturalness of milk fat or the presence of impurities.

Along with the development of the livestock industry, the volume of dairy product production is also increasing in the Republic of Uzbekistan. However, scientifically based work on analyzing the properties of milk fats has not been sufficiently established.

Research on the fat content, fatty acid ratios, vitamin content and biological value of milk from local breeds of animals is being conducted at a more practical experimental level. Therefore, it is necessary to strengthen cooperation between scientific institutes and food technology centers, and provide them with modern laboratory equipment.

Another important aspect is the establishment of environmental monitoring. Because in some regions, as a result of contamination of the feed base, the presence of heavy metal ions, pesticide residues and other harmful substances in milk fat has been noted. This threatens the safety of dairy products.

In order to thoroughly study the properties of milk fats and eliminate problems, it is advisable to work in the following areas:

Systematic study of the chemical composition of milk fat of local breeds of animals.

¹Qodirov, A. Sut yog‘larining fizik-kimyoviy tahlili. Samarqand: SamDU nashriyoti. 2020—163 b.

Practical application of new analytical methods - chromatography-mass spectrometry, NMR spectroscopy, etc.

Improving the quality of milk fat by optimizing feed and care conditions.

Introduction of low-temperature, environmentally friendly methods in milk processing technologies.

Development of national standards for dairy products suitable for the conditions of Uzbekistan.

Also, expanding the processing of goat and sheep milk, establishing the production of cheese, yogurt, kefir and other fermented products in this direction will increase economic efficiency.

Milk fats serve as a source of energy in the human body, strengthen the immune system and ensure vitamin metabolism. In particular, linoleic and linolenic acids in milk fat ensure healthy functioning of the cardiovascular system.

Goat milk fats are distinguished by the low incidence of allergic reactions. Therefore, products based on goat milk are recommended for children and people prone to allergic diseases. Sheep milk fat is high in calories and has a full satiating effect, which is useful for people with high energy expenditure.²

In conclusion, the study of the properties of milk fats from large and small horned animals is not only scientific, but also practical.

In-depth study of their chemical composition, physical state and biological activity serves to improve the quality of dairy products, strengthen human health and ensure national food security.

Today, in order to solve existing problems in the field of milk fat research in Uzbekistan, it is necessary to strengthen the scientific and research infrastructure, study international experience and develop technologies suitable for local conditions.

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² Hasanov, N. Hayvonchilik mahsulotlari sifatini oshirish omillari. Toshkent: Innovatsion rivojlanish nashriyoti. 2023 — 198 b.