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PHYSICAL and CHEMICAL PARAMETERS of YOGURT MADE from ZAANEN GOAT 's MILK

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The article presents research on the physical and chemical parameters of milk and lactic acid yogurt product from Zaanen goat breeds grown in the Akmola region. It was found that the fat content of goat's milk for the main indicators is on average 4.4%, for protein-3.4%, which corresponds to the indicators of GOST 32940-2014. Yogurt was produced using bacterial concentrated yeast cultures Profiline and Golden time.

Keywords: goat, Zaanen breed, goat's milk, milk fat, density, yogurt

ФИЗИКО-ХИМИЧЕСКИЕ ПОКАЗАТЕЛИ ЙОГУРТА, ПРИГОТОВЛЕННОГО ИЗ КОЗЬЕГО МОЛОКА ЗААНЕНСКОЙ ПОРОДЫ

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В научной работе были проведены исследования по физико-химическим показателям молока из зааненских пород коз, выращиваемых в Акмолинской области, и кисломолочного йогурта, получаемого из него. По основным показателям козьего молока жирность составила в среднем 4,4%, по белку-3,4%, т. е. установлено, что соответствует показателям ГОСТ 32940-2014. Йогурт производился с использованием бактериальных концентрированных дрожжевых культур Profiline и Golden time.

Ключевые слова: коза, зааненская порода, козье молоко, молочный жир, плотность, йогурт

Introduction. Kazakhstan has good prospects for the further development of the agro-industrial complex: the export position of the dairy and meat industries is growing, and in terms of wheat and flour, Kazakhstan in a short time became one of the largest exporting countries in the world. The membership of the Republic of Kazakhstan in the Eurasian Economic Union and the World Trade Organization simultaneously provides opportunities and places high demands on competitiveness in the domestic and foreign markets. In this regard, the production and export of competitive goat's milk and dairy products, which provide the population with domestic pure goat's milk, dairy products, is of great importance.

The state program for 2017-2021 provides for an increase in the volume of livestock production by 6748 thousand tons in 2021 [1].

Goat's milk is good for metabolic disorders, prevents colds, helps in the treatment of cancer, increases strength, accelerates recovery processes, slows down aging and supports the immune system. Milk and dairy products are the best natural, curative, rich in vitamins, so it is very important to develop a goat dairy farm. This will not only increase the GDP of the country's agro-industrial complex, but also meet the growing demand for therapeutic nutrition of people who do not tolerate cow's milk, people with low immunity, diseases of the gastrointestinal tract, and diabetics.

The share of goat's milk in the total volume of world dairy products produced from all types of farm animals is about 2%, and the cost in most countries is equal to two units (liters) of cow's milk, which is due to the peculiarities of its physical and chemical composition. According to the FAO, the level of production of goat's milk in the world (about 12-13 million tons). t.) sheep's milk (7-8 million. 1.6-1.7 times higher than T.) [2]. Goat's milk products are considered an exotic dish for most people. In addition, it is also used as a healthy food product. Goat's milk and its processed products can be used as dietary and therapeutic food for all categories of the population, including for feeding children with allergies to cow's milk [3,4]. Potential opportunities for the production and processing of goat's milk in Kazakhstan are gradually increasing.Currently, it is mainly produced from zaanen dairy goats bred in private farms near Almaty, in the complexes of "Sarayshyk" LLP in Atyrau region, "Ordabasy" LLP in Turkestan region, "PH Zerenda" LLP in Akmola region, so their dairy products are currently not available in the domestic market. That is, pasteurized, sterilized goat's milk, yogurt, cheese, butter are produced in small quantities.

Recently, due to the growing demand for goat's milk and its products, the production and processing of goat's milk has been widely developed and is becoming increasingly important. Therefore, in recent years, there has been an increase in new developments and research related to goat's milk with technical and economic advantages [5]. Yogurt, one of the products of goat's milk, belongs to the most popular dairy products, currently the production of yogurt from goat's milk is growing every year. At the same time, due to the use of Bulgarian cane in the composition of yeast in strict compliance with sanitary standards and technological norms, goat's milk products can be used not only as a food product, but also as probiotic preparations for the prevention and complex treatment of many diseases in various fields of Medicine [6]. In this regard, the relevant direction is the production and processing of goat's milk.

The purpose of the study is to determine the physical and chemical parameters of goat's milk and the finished product obtained from it – yogurt.

Methodology and form of research. In accordance with the tasks set, the research was carried out on a goat farm in Akmola region. The object of the study was raw milk of the zaanen goat breed and yogurt, a product of goat's milk. According to the chemical composition of milk, the

main performance indicators were determined. During the study, the following methodology was used, sampling and preparation for testing and analysis were carried out according to the 26929-94 place "sampling and preparation for testing" [7,8]. The chemical composition of milk was carried out in the laboratory of the Department of "Technology of production and processing of livestock products" of the Kazakh agrotechnical university named after S. Seifullin. The acidity of milk and dairy products was determined by a meter using special acid testing equipment. In determining the organoleptic and other indicators of goat's milk, the interstate standard 32940-2014 "raw goat's milk"and the technical conditions of GOST RK "National Kazakh dairy products" were used in determining the main indicators of yogurt food [9].

The results obtained and its analysis. The zaanen goat breed is bred on the farm. The birthplace of the most valuable and highly productive dairy goat breed zaanen is Switzerland. It breeds the best dairy goats of the zaanen, Toggenburg and appenzel breeds (especially the first two), which had a great influence on the development of dairy goat breeding not only in Europe, but also around the world.

In general, compared to Central European goats and related goat breeds, zaanen goats are relatively large, bony, which is a good combination of fastness and high dairy productivity. Compared to Kazakh goats, the zaanen breed has a higher milk yield and is known around the world as the Holstein goat. The yield of domestic goat breeds is 1.5-2 liters per day, and the yield of the zaanen breed reaches 5-6 liters. The average milk yield at this enterprise is 650 kg of milk. The physical and chemical indicators of goat's milk varied depending on the seasons, the physiological state of the goat, and the periods of the milking season. Table 1 shows the composition and properties of the main indicators of goat's milk obtained on average.

Table 1-The main indicators of goat's milk.

№	Indicators	норма	нақты
1	Mass fraction of fat,%	Not lower than 3.2	4,4±0,06
2	Mass fraction of protein, %	Not lower than 2.8	3,4±0,05
3	Mass fraction of dry matter, %	Not lower than 11.8	12,5±0,03
4	Titer acidity, 0T	Not lower than 14 and not higher than 21.0	17,5±0,06
5	Density kg / m3	1027,0-1030	1028±1,0

In the analysis of goat's milk indicators, the difference in titer acidity of milk from cow's milk is insignificant. The density of milk is high, because it depends on the chemical composition

of the milk. It should also be noted that goat's milk is not heat-resistant (tolerates t = 130°C for 19 minutes). In terms of milk fat and protein content, goat's milk has some advantages over cow's milk. Therefore, it was found that the milk of zaanen goats is suitable for milk production and has a high milk yield, and the fat content of milk is sufficient even for the production of some dairy products. For the production of goat's milk products in the industrial industry, the technical condition of GOST 32940-2014 "raw goat's milk" is used. Physical, chemical and organoleptic parameters of goat's milk, as shown in Table 1, showed that they meet the requirements of this technical condition. Yogurt,one of the products of goat's milk, belongs to the most popular dairy products, that is, yogurt is used not only as a food product, but also as probiotic preparations in various branches of medicine, for the prevention and comprehensive treatment of many diseases, as the most necessary food in the children's diet. Therefore, at present, the production of yogurt from goat's milk is growing every year. If we talk about the technology of obtaining yogurt products in the production shop for the production of yogurt. Yogurt is produced from unpasteurized milk using bacterial concentrated yeast cultures Profiline and Golden time in accordance with the technical conditions of GOST RK" National Kazakh dairy products [10].

Goat's milk is poured into a hopper mixer, where it is mixed according to the recipe with the addition of sugar, stabilizer and other components. The main liquid enters the tubular pasteurizer, where it is subjected to heat treatment at a temperature of 85-870C for 15 minutes. Then special yeast is introduced until the main liquid passes into the fermentation tanks and reaches a certain level of acidity (ph 4.5-4.6). As yeast, bacterial concentrated yeast cultures Profiline and Golden time are used. The fermentation process lasts 4-6 hours until the known acidity level is reached, and the condensed liquid is sent to the cooler. Then the thermoblock is thermized at a temperature of 85^0C with the addition of special natural additives to taste. The finished product goes further to the packaging equipment. The shelf life of the finished product is 2 days at a temperature of 4^0-7^0C. Currently, increasing the nutritional and biological value of food products, taking into account the modern physiology of nutrition, is carried out in specific ways that allow scientifically based enrichment of fermented dairy products.

Modern ideas of rational nutrition mean providing the human body with a certain amount of protein substances, carbohydrates, fats, vitamins and mineral compounds. Physical and chemical corsets of yogurt are shown in Table 2.

Table 2-Physical and chemical indicators of yogurt

№	Indicators	Results, %
1	Protein	2,45
2	Dry matter	24,62
3	Fat content	3,14
4	Carbohydrates	15,22

The results in the table show that the resulting product is enriched with proteins. Protein plays a particularly important role in this series. Proteins in the human body perform several important functions - plastic, catalytic, hormonal, specific, and transport functions. Protein quality indicators are related to the assessment of the amino acid composition of products.

Table 3-results of microbiological studies of yogurt

№	Name of indicators	Standard for OD	Real results	OD by test methods
1	Microbiological indicators: lactic acid microorganisms Koe / g(cm3)	$1*10^7$	$1*10^7$	GOST 10444-89
2	Vitamins, mg / 100g; C		2,15	GOST 24556-89
3	Viscosity, PA*s		19,1	GOST 27709-88

As can be seen from the results of microbiological studies of the finished product-yogurt, the content of vitamin C increased and amounted to 2.15 mg/100 g, it was found that it corresponds to yogurt in terms of safety and quality indicators.

Conclusion. Thus, zaanen showed that the physical, chemical and organoleptic parameters of goat milk meet the requirements of this technical condition. This means that by processing goat's milk, it is possible to obtain pasteurized milk, fermented milk products and cheese. Currently, the range of products produced from goat's milk is not very large. According to the demand of the population, yogurt is produced from non-skimmed milk. Yogurt was produced using bacterial concentrated yeast cultures Profiline and Golden time. It should be noted that in the processing of goat's milk, equipment of production imported from Italy is used.

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