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MILK QUALITY FOR CHEESE PRODUCTION IN SILAGE TYPE FEEDING OF COWS

ЯКІСТЬ МОЛОКА ДЛЯ ВИРОБНИЦТВА СИРУ В УМОВАХ СИЛОСНОГО ТИПУ ГОДІВЛІ КОРІВ

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Abstract. *The results of studies to study the relationship of changes in milk indicators obtained in the silage type of feeding of dairy cows of the farms of Chernivtsi region are presented. The causes of low quality cheese, which is made from cows, which are in conditions in the stall period of silage feeding. In the winter and spring, when protein deficiency in the diets is observed, there is a decrease in protein content in milk. In other periods of the year, with increased protein nutrition, the protein content in milk increased. The correlation coefficient between them $R = 0.976 \pm 0.068$. Summer milk contained 7% more casein than milk obtained during the feeding of cows with silo. The lower content of casein in milk in the spring, which reduces the yield of cheese by 10-11%. The highest density values are marked in August-September.*

Keywords: *cheese, milk, density, diet, silo, cows, casein, nutrition.*

Much attention is paid to the production of improved complete foods with high protein content and biologically active substances. Such products include cheese. The tendency to increase cheese production is aimed at solving the problem of full -fledged protein nutrition and more complete use of components of milk. However, much of the current cheese is not responsible for the quality of the high requirements for this product. Cheese production has increased milk quality requirements. [1, 2].

Due to the widespread use of corn silage for feeding cows a number of authors have studied its impact on the quality of milk and cheese [4].

The authors did not think about the use of corn silage in cheese production zones. The quality of industrial cheeses produced in areas where animals are used for animal feed, as long as the lower quality of those areas where it is not used. In addition, such studies were conducted only in the research conditions of certain areas of the country,



and there are almost no work on the study of production conditions for feeding cows and the quality of commodity milk for cheese production in the western regions of the country [3, 5].

Given the relevance of the problem of increasing production and improving the quality of cheese and its dependence on the quality of milk, which is obtained in the conditions of silage type of feeding of cows in the western regions of Ukraine, (Chernivtsi region) were set the following tasks: to determine the biochemical composition and technological properties of milk in the silage type of cows feeding ; Identify seasonal changes in sanitary and hygienic indicators of milk quality; Establish the relationship between cheese quality and milk quality; To study the impact on the quality of fodder rations with the addition of diamone phosphate; On the basis of the obtained data, give an in -depth characteristics of milk cheeseship in the silage type of feeding milk cows, to introduce the results obtained in the zones of Chernivtsi region, where cheese is produced. The object of the study was the milk milk obtained from the cows of the Simimental breed in the conditions of silage type of feeding on farms of farms of Chernivtsi region. In one of the farms to the silo diet was added diamone phosphate

At cheese factories, a scientific and production experiment was conducted to study the relationship of changes in the indicators of milk obtained in the above conditions, with the quality of cheese. Monthly for two years from each farm, samples of morning milk and average daily samples were selected. Morning milk samples were investigated for temperature, fat content, density, acidity, purity of a relict treatment, a relict test was put. Daily samples of milk were investigated in the laboratory of the Department of Food Technologies for Food Production and Standardization. Depending density, dry matter, cata, fat, total protein, casein and its fractions, serum proteins, non -protein nitrogen, ash content, phosphorus. Calcium, sodium, potassium and magnesium.

To study the quality of milk as raw materials for cheese production, experimental cooking of solid rennet cheese of the Dutch brown cheese by conventional technology was carried out. In whole and low -fat milk, density, fat, acidity were determined. In



the normalized mixture, dry matter, fat, density, acidity, common protein, casein, serum proteins, calcium, phosphorus, sodium, potassium, in mature cheeses - fat, dry substance, ash, acidity, sodium chloride content, general and soluble protein. , maturity [1, 7].

Studies of milk, cheese, whey, normalized mixture for cheese and low -fat milk were carried out by standard methods and techniques [5, 6].

The example of the Chernivtsi region revealed a close relationship between the biochemical composition and technological properties of milk, depending on the conditions of feeding dairy cows in the region. The causes of low quality cheese, which is made from cows, which are in conditions in the stall period of silage feeding.

The keeping of animals in the winter is tied in cowsheds, with motion on walking pads, in the summer - pasture. Milking three times. Most of the farms of the zone use rations saturated with corn silage by 10-15% of total nutrition. In the summer, all farms are fed by green conveyor cultures: winter rye, wheat, sowing cereals and legumes, corn. In the structure of summer diets, green fodder was 72-75, and concentrates 25-28% of the nutritional value of the rations changed significantly during the seasons. One feed unit in the winter had digestible protein 64 g, sugar 60 g, raw fat 35 g, calcium 8 g, phosphorus 4 g.

In the spring, the overall level of feeding animals was declining. In the summer, feeding of cows was more complete. Each forage unit accounted for 74-78 g of digestible protein, 150-160 g of sugar, 9 g of calcium and 4 g of phosphorus. On average, in two years of studies, milk contained in a percentage of 11.76 ± 0.05 solids, 8.27 ± 0.03 - Somo, 3.45 ± 0.01 - fat, 2.96 ± 0.114 - protein, in the case number of casein 2.35 ± 0.041 , serum proteins - 0.605 ± 0.007 ; 0.026 ± 0.0007 - non -protein nitrogen and 0.717 ± 0.005 - ash. A-vitamin activity of milk was in winter 618 ± 17.34 , in the spring- 377 ± 9.21 and in the summer- 1136 ± 28.3 m/ kg. In the milk under study, the content of the main components (solids, fat and protein) is lower by 5-9% in relative calculation compared to the genetic capabilities of the Simimental breed of cows. The content of all components in milk is undergoing seasonal changes. Low content of solids, fat, protein is set in the spring. The decrease in the fat content of milk in the



spring is associated with insufficient feeding of animals by the main nutrients and mass calving at this time.

In the winter and spring, when protein deficiency in the diets is observed, there is a decrease in protein content in milk. In other periods of the year, with increased protein nutrition, the protein content in milk increased. Seasonal changes in casein are similar to protein changes.

The correlation coefficient between them $R = 0.976 \pm 0.068$. Summer milk contained 7% more casein than milk obtained during the feeding of cows with silo. The lower content of casein in milk in the spring, which reduces the yield of cheese by 10-11%.

The content of fractions of $\alpha + \beta$ -casualties was 88.3% with fluctuations from 84.56 to 92.44% monthly. The amount of γ -code in milk decreased by the end of the calendar year, which improved the technological properties of milk for use in cheese production. A close correlation between the ratio of protein/fat and $\alpha + \beta$ -casual/fat is established. The correlation coefficient $r = 0.92$. The average annual content of mineral elements in commodity milk was as follows (in mg/%): calcium - 120.53 ± 0.46 , phosphorus - 97.03 ± 0.66 , potassium - 119.73 ± 7.679 , sodium - $33.86 \pm \pm 0.245$, magnesium - 10.66 ± 0.020 .

Calcium fluctuations relative to the average data range from 10.4 to 12.7%. The phosphorus content in milk deviations from the average values did not exceed 4.8%. The amount of calcium in milk decreased from winter to summer, the most marked in the fall. The patterns in the dynamics of phosphorus have not been established. The low content of calcium and phosphorus in milk makes it less suitable for cheese production. The amount of potassium in milk changed in the seasons of the year. Its minimum number was in May and November. The sodium content has a tendency to reduce it from winter to summer. The largest amount of magnesium in milk was observed in the summer.

The density of milk, which reflects its composition, was relatively low - $1028.08 \pm 5.14 \text{ kg/m}^3$. In the change in the average density of milk in the months of the year there is an increase from May to October and a decrease from November to April. The



highest density values are marked in August-September. The acidity of milk has changed little in seasons. The close relationship between the number of microorganisms in milk and acidity is confirmed by the positive correlation coefficient $R = 0.840 \pm 0.171$.

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Анотація. Наведені результати досліджень з вивчення взаємозв'язку змін показників молока, отриманого при силосному типі годівлі молочних корів господарств Чернівецької області. Встановлені причини низької якості сиру, який виробляється з молока корів, що знаходяться в умовах в стійловий період силосної годівлі. В зимово-весняний період, коли спостерігається дефіцит протеїну в раціонах, відмічене зниження вмісту білка в молоці. В інші періоди року при підвищенні протеїнової поживності раціонів вміст білка в молоці зростає. Коефіцієнт кореляції між ними $r = 0,976 \pm 0,068$. Молоко літнього періоду містило на 7% більше казеїну в порівнянні з молоком, отриманим в період годівлі корів силосом. Нижчий вміст казеїну в молоці навесні, що зменшує вихід сиру на 10-11%. Найбільші значення густини відмічені у серпні-вересні.

Ключові слова: сир, молоко, густина, раціон, силос, корови, казеїн, поживність.