

Аналізуючи дані, ми відмітили середній коефіцієнт повторюваності за живою масою серед ярок I групи  $r_w = 0,56$ , і дуже високій серед ярок II групи  $r_w = 0,79$  в період 4– 8 місяців. Також, можна відмітити, що високий коефіцієнт повторюваності зберігається в період 8 -14 місяців, відповідно,  $r_w = 0,54$  та  $r_w = 0,77$ .

За довжиною вовни коефіцієнт повторювальності в 4 – 8 місяців для ярок I групи коефіцієнт складав  $r_w = 0,44$ , а серед ярок II групи  $r_w = 0,62$ . Така ж високий тенденція зберігається в період 8 -14 місяців., відповідно,  $r_w = 0,38$  та  $r_w = 0,60$

Висновки. Цигайська порода овець характеризується високою відтворювальною здатністю та скороспілістю, комбінованою продуктивністю, характеризується витривалістю та життєздатністю, тому використання її як материнську форму для схрещування є дуже доцільним.

Проводячи аналіз даних можна зробити висновок, що відбір ярок за живої масою, та довжиною вовни був би більш ефективним в 4 місячному віці. Тварини які мали більшу живу масу і довжину вовни в 4 місячному віці в наступні вікові періоди проявили би свій генетичний потенціал.

#### Список використаних джерел

1. Басовський М.З. та ін. Розведення сільськогосподарських тварин. Біла Церква, 2001. 400 с.
2. Бинкевич В. Я. та ін. Вівчарство України: основні тенденції функціонування галузі. Науковий вісник ЛНУВМБТ імені С.З. Гжицького. С .212-220.
3. Вороненко В. І. Довідник з вівчарства. Нова Каховка: «ПІЕЛ», 2008. С. 113–115.

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### COMPARATIVE STUDY OF THE LOCAL MOZZARELLA CHEESES QUALITY

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**Relevance.** With the economic development of our country, the consumers' demand for a safe and healthy product has also increased. That is why food products are subject to drastic control, which ensures their quality. Cheese is an extremely versatile food product that has a wide range of flavor, textures and end uses. Mozzarella is part of the pasta filata cheeses, it was originally made from buffalo milk, but now it is produced from cow milk in many countries [2,3,4]. Due to its high trophic-biological potential and dietary-culinary properties, mozzarella cheese is in great demand with the local population. In the Republic of Moldova mozzarella cheese is a new product, obtained according to Italian technologies with the adjustment of the technology to the conditions of the Republic of Moldova. The local consumers and producers are interested in this cheese. That's why we decided to evaluate the quality of mozzarella cheese from local producers.

**Material and methods.** The purpose of the research is to evaluate and control the local mozzarella cheeses quality. The achievement of this purpose involves the following objectives: appreciation of the local products packaging and labeling, studying the quality of the metric indices, analyzing the quality of the sensory parameters, determining the quality of the physical and chemical indices. In order to carry out the research, three samples were purchased from two local producers: Sample I - "Mozzarella from Braviceni", the producer Bravilacta SRL; Sample II - "Perle di Mozzarella", the producer: Ferma cu origini. The evaluation of the product quality and the analysis of the physico-chemical, sensory and metric indices of the analyzed samples were carried out within the "Laboratory of milk and dairy products evaluation" of the SAUM. After the organoleptic indicators were analyzed, the fat content in the cheeses was determined by using the acid-butyrometric method, the water content was determined by using the "Lacta" balance, the titratable acidity of the cheeses [1]. The evaluation of the sensory indices of the mozzarella cheeses was carried out in accordance with the requirements in force regarding the Quality Requirements for Milk and Dairy Products (GD no.158 of 07.03.2019).

**Results and discussion.** We have analyzed the packages marking of the examined products. All the marking data are placed on the packaging. The product is packed in a plastic box. The package is hermetically sealed, thus completely isolating the product from the external environment factors. The package is transparent, which allows us to visually see and analyze the product in the box. We pay attention to the shape, size and integrity of the mozzarella spheres and the way they are placed in the box, to the colour of the brine, and whether there are unusual sediments and impurities in the brine of the product. Another important feature of the packaging is the product labeling. The purpose of the label is to give the consumer the necessary, sufficient, verifiable information, so that he has the possibility to choose his products according to his requirements, financial possibilities, but also to know the risks to which he exposes himself by consuming the product in question in case some ingredients present in the product are contraindicated to him.

Analyzing the results of the packaging marking research, we notice a remarkable difference in the way of representing the data on the packaging. Each label is the producer's brand with specific indications, regarding the commercial name of the product and the ingredients used. Besides the difference in the basic ingredients contained in mozzarella cheese, there is a difference in the use of certain ingredients: the salt, which is present in the cheese from sample I and we notice its lack in the cheese from sample II. The biological and nutritional value differs from one producer to another. The amount of fat indicated on the package, has the highest value in the "Perle di Mozzarella" cheese – 26,8 g / 100 g of product, for the cheese from sample I - it is 25,0 g / 100 g of product. The cheese from sample II has high energy value – 345,2 kcal/100 g of product. The cheese "Mozzarella from Braviceni" is characterized by low energy ratio of 313 kcal / 100 g of product, which is explained by a lower content of proteins and fats.

The determination of the metric indices aims to know the differences in weight, size and diameter of the product used in consumption, these indices also have a great significance in the culinary field. The data obtained after determining the metric indices of the cheese samples show that each manufacturer capitalizes its product in different quantities. From the represented data we can see that the cheese from sample I is characterized by a total weight of approximately  $613 \pm 5,23$  (g), of which the mass of the masa «netto» constitutes –  $444,6 \pm 21,6$  grams, while the cheese from sample II has only  $261,5 \pm 13,3$ (g). The weight of one Mozzarella ball reaches, an average value of  $6,14 \pm 0,39$  (g) - (sample I), and  $10,6 \pm 0,33$  (g) - (sample II). The spheres are characterized by a diameter of  $20,7 \pm 1,2$  (mm) and  $29,3 \pm 0,88$  (mm), respectively. A noticeable difference was observed in determining the number of spheres present in the box. Cheese from sample I contains more spheres in the box -  $74 \pm 0,58$  (pieces), compared to sample II -  $24 \pm 1,2$  (pcs).

After having examined the metric indices, the cheese samples were subjected to the sensory evaluation, which was based on the visual appearance, section appearance, taste, flavour, consistency and colour. Having evaluated the visual appearance and the section appearance of the cheese from the experimental samples difference were not detected. The cheese from sample I had a specific milky taste, while the cheese from sample II had a pleasant taste, specific to sweet cream, slightly acid. The same trends were observed during the flavour evaluation. The consistency of the cheese from sample I was dense, elastic, fibrous. The cheese from sample II had soft, fine and elastic consistency. The colour of mozzarella cheeses from the investigated batches was highlighted. The cheese from sample I had a uniform white-yellow colour. During the sensory evaluation defects of taste, flavor and color were not found.

Knowing the physical and chemical characteristics of the cheese allows us to get a detailed knowledge of the milk quality which served as raw material and to take the necessary measures in order to obtain quality cheese. The determination of these indices allows the proper use of the product in the diet, these parameters also indicate the

trophic-biological potential of the product. The finished product of each manufacturer differs by the physical and chemical parameters that it has. The fat content in the cheese samples II constitutes  $25,1 \pm 1,02$  (%), ( $\pm S=1,77$ ), so is higher than in sample I –  $24,2 \pm 2,2$  (%), ( $\pm S=3,85$ ). The cheese "Mozzarella from Braviceni" is characterized by a lower water content –  $61,6 \pm 0,68$ %( $\pm S=1,19$ ), compared to „Perli de Mozzarella"-  $57,6 \pm 0,5$  (%), ( $\pm S=3,85$ ), ( $P < 0,01$ ). The titratable acidity of the cheese from sample I is characterized by a higher value and reaches on average -  $94,6 \pm 1,3$  (°T), ( $\pm S=2,3$ ), ( $P < 0,01$ ). The value of this characteristic parameter for mozzarella from sample II is lower and constitutes  $84,6 \pm 0,66$  (°T), ( $\pm S=1,15$ ), ( $P < 0,01$ ). The cheese from sample II, compared to the sample I, is characterized by a slightly acid taste, this is due to the free acidity, which has a value of  $5,4 \pm 0,03$ . The same assortment may vary according to taste and nutritional value depending on the physical and chemical parameters present in the product.

**Conclusions.** The research carried out on the products made for public consumption allows us to draw the following conclusions: The obtained results show that the quality of the packaging and labeling of the mozzarella cheese samples from the local producers meet the permissible requirements in force for the given products. According to the sensory evaluation mozzarella cheese produced by local producers complies with the rules in force. Following the analysis of the physical and chemical parameters of the studied cheeses, differences were found between the studied variants. Thus, in terms of water content and fat content relative to dry matter, titratable acidity and free acidity, the requirements of the standard for the experimental variants are met. The cheese quality evaluation shows that all the samples comply with the requirements of the standard in force according to the studied indicators, but there were stated differences between the studied variants. Analyzing the data obtained from the laboratory expertise, we can say that both types of cheese are made in accordance with the requirements of the technological process and recipe data. This determines the fact that these products are harmless to the health of the consumer.

### Bibliography

1. Guzun, Valentina. Technology of milk and dairy products. Laboratory and practical work. Chisinau, Ed.Civitas. 1998.
2. Jana AH, Govind P. Tagalpallewar. Functional properties of Mozzarella cheese for its end use application. J Food Sci Technol.2017 Nov; 54(12): 3766–3778.
3. Myrna Martinez-Martínez, Jorge F Velez-Ruiz. Development and Physicochemical Characterization of a Functional Mozzarella Cheese Added with Agavin. Journal of Food Science and Nutrition Research 2 .2019. 87-107.
4. Usturoi M. Control of milk and derived products. Iasi: PIM, 2012, 177