DOI 10.37000/abbsl.2025.115.09
UDC 637.12.05

Olha Piven,
PhD, Docent, Associate Professor of the Department of Infectious Pathology, Biosafety and Veterinary and Sanitary Inspection named after Professor V. Ya. Atamas
Odesa State Agrarian University
Odesa, Ukraine
ORCID ID 0000-0001-8168-1677
e-mail: olhapiven@gmail.com

Alyona Prysyazhnyuk,
6th year student of the second (master's) level of higher education, EP «Veterinary Hygiene, Sanitation and Expertise»,
Odesa State Agrarian University,
Odesa, Ukraine
ORCID ID 0009-0005-8626-6057
e-mail: uvhtdvf79@gmail.com

SEASONAL DYNAMICS OF SOMATIC CELL CONTENT IN MILK OF COWS FROM HOMEHOLD FARM

Abstract

The article presents the results of monitoring the seasonal dynamics of the content of somatic cells in raw cow's milk during 2024-2025. During the research period, samples of raw cow's milk taken at the agri-food markets of Odessa, as well as samples of raw cow's milk taken at the city's spontaneous markets, were examined. The obtained research results showed that for most of the year, samples of raw cow's milk sold at the agri-food markets of Odessa, in terms of somatic cell content, meet the requirements for high-quality raw materials, according to the current Ukrainian standard DSTU 3662:2018 "Raw cow's milk. Technical requirements", which regulates the safety and quality of this product of animal origin. In particular, it was found that the largest number of somatic cells in raw cow's milk from agri-food markets was detected during June, October and November, respectively - 420.0±3.5; 425.5±3.2 and 429.8±3.8 thousand/cm3. All these values, according to the current DSTU 3662:2018, correspond to first-grade raw milk. At the same time, samples of cow's milk from the spontaneous markets of Odessa, in most cases, can be attributed to first-grade and non-grade raw materials. In addition, the study found an increase in the content of somatic cells in both types of raw cow's milk samples in the fall (October-November) and in the spring (April-May). Thus, the average content of somatic cells in raw cow's milk sold at the spontaneous markets of Odessa exceeds the average annual indicators in samples taken at agri-food markets by 21%. The increase in the content of somatic cells in raw cow's milk is in most cases associated with the presence of subclinical mastitis in dairy cattle, which often does not have pronounced clinical manifestations, however, milk from such animals is dangerous for consumption by humans and animals, as it contains an increased number of microorganisms. The presented research results also proved the feasibility of combating spontaneous markets, because the products sold in them are not subject to veterinary and sanitary inspection and in most cases pose a threat to the health of consumers, causing outbreaks of food infections and toxicosis.

Keywords: *dairy herd, herd health, somatic cells, spontaneous markets, bacterial contamination of milk, subclinical mastitis.*

Introduction. Cow's milk, being a valuable food product, has been highly valued all over the world since ancient times. This food product is part of the daily diets of millions of people. In addition, raw milk is the basis for the production of a different types of fermented milk products. However, cow's milk is also characterized by perishability, and is also a product of biological origin that can act as a source of transmission of zooanthroponous diseases to humans, be a source of outbreaks of foodborne infections and toxicoinfections [8].

One of the leading parameters by which a hygienic assessment of milk can be carried out is the number of somatic cells in the raw material. This approach is widely used in EU countries, Canada, and the USA. In Ukraine, determining the content in raw milk is also mandatory, as it allows you to conclude that hygiene requirements have been met in the process of obtaining raw materials, and also allows you to identify animals with subclinical mastitis [9]. Somatic cells are always present in milk, but their number increases when an infectious agent enters the udder or it is damaged [24].

In Ukraine, the issue of the quality of cow's milk raw material is very acute, because the majority of raw material is produced on homestead farms (70%). Accordingly, it is very problematic to monitor compliance with sanitary and hygienic requirements in such farms [13].

Analysis of recent research and publications. The sanitary and hygienic quality of cow's milk production is a significant problem, because the general bacterial contamination of dairy raw materials is a set of sources of microorganisms entering the technological environment. That is, this includes the microflora of the udder, the microflora of the udder canals, bacterial contamination of milking equipment, the microflora of service personnel and the environment. However, it should be understood that during the processing process, the quality indicators of raw milk cannot be improved, they can only be stabilized [2, 4].

Raw milk acts as a nutrient medium for the reproduction and preservation of a significant number of microorganisms, including pathogenic and toxic ones [3]. Literature sources indicate that raw milk most often contains not only micrococci, psychrophilic microorganisms belonging to the genera *Achromobacter*, *Pseudomonas*, *Aeromonas*, *Enterobacter*, but also pathogenic and conditionally pathogenic microorganisms (*Escherichia coli*, staphylococci, corynebacteria, streptococci, etc.), which are the cause of inflammatory processes in the mammary gland and can cause consumers' food poisoning [4, 15].

Today, the most common method of heat treatment of raw milk is pasteurization, which can be carried out using various thermal regimes. The most effective approach that allows obtaining safe and high-quality dairy raw materials from dairy herds is the implementation of the HACCP system, recognized in most countries of the world, at the facilities of market operators [1, 3, 20].

A significant problem at raw milk production facilities is the problem of mastitis in cows, which leads to economic losses and reduced animal productivity

[10, 22]. Pathology occurs under the influence of a complex of exogenous and endogenous factors. The disease is manifested by morphological changes in tissues and physicochemical properties of milk. The nature of the manifestation of the inflammatory process directly depends on the duration of exposure to mechanical, thermal and chemical factors. They are the cause of the decrease in resistance of the mammary gland of cows. Against this background, optimal conditions are created for the influence of microorganisms [5]. The most dangerous form of mastitis is subclinical, which can be detected only by the content of somatic cells in the milk (leukocytes, epithelial cells). According to European standards, raw milk should contain no more than 250 thousand somatic cells per 1 cm^3 [6-7]. Literature sources report that an increase in the content of somatic cells, in some cases, may be associated with the onset of lactation, with the period of start-up and estrus [16, 23]. There are studies that prove the connection in cows between morphological and molecular genetic parameters of mastitis incidence [18]. According to literature sources, the content of somatic cells in milk is influenced by the productivity of dairy cows, their health, stage of lactation, and breed. In addition, any change in environmental conditions, unsatisfactory management methods on farms, as well as stress factors significantly increase the content of somatic cells in raw milk. On the other hand, compliance with hygiene requirements, as well as rational feeding, allows you to reduce the content of somatic cells in milk [21, 25-26].

According to scientists, mastitis in 90% of cases proceeds without clinical manifestations. Research results demonstrate that mastitis milk is characterized by a reduced density (less than 1025.0), titrated acidity (14–15 °T), and its active acidity is 7.7–7.1. During mastitis, the fat content of raw milk first increases and then decreases [11, 19]. Scientists report that as the content of somatic cells in raw milk increases, its biological value is lost; technological properties deteriorate during processing, and the acidity of milk decreases; losses of fat, casein, lactose, etc are observed [18].

Today, biochemical, cytological and bacteriological methods are used to diagnose subclinical mastitis. Indirect express methods for determining the increase in the number of somatic cells in raw milk include: Whatside test; California mastitis test; test with dymastine, mastidine; settling test [14]. There are reports that raw milk, which is supplied for sale to agri-food markets, should be examined for physicochemical parameters in 100% of cases, especially in autumn and spring [17].

There are several approaches to monitoring the health of cows' udders in the world: milk sampling from a common tank and individual sampling. For the purpose of monitoring, tests are carried out on an ongoing basis for the content of *E. coli*, total bacterial contamination and somatic cell count [12].

The aim of the study was to investigate the seasonal dynamics of the content of somatic cells in raw cow's milk, which is sold in dairy buildings of agro-food markets in Odesa and in spontaneous markets.

Presentation of the main research material. The research was conducted at the Department of Infectious Pathology, Biosafety and Veterinary and Sanitary Inspection named after Prof. V. Ya. Atamas and at the Multidisciplinary Laboratory of Veterinary Medicine of the Odesa State Agrarian University.

The study period was from June 2024 to May 2025. Every month, samples of raw cow's milk were randomly selected at the agri-food markets of Odesa (5 samples each month) and at the spontaneous markets of Odesa (5 samples each month). A total of 120 samples of raw cow's milk were tested during the research period.

The content of somatic cells in the raw material was determined using the Somatos-B device (viscometer). The device was used according to the instructions for use available for it, with calibration performed before each measurement. The essence of the measurement was to mix the specified volumetric quantities of milk and an aqueous solution of the drug "Mastoprim" and then determine the relative viscosity of the mixed samples by the time it took for their equal parts by volume to flow through the capillary. The obtained measurement results were compared with the requirements of the current DSTU 3662:2018 Raw cow's milk. Technical conditions.

The obtained measurement results were processed statistically, determining the mean value (M) and deviation from the mean (±m), using Microsoft Excel software for processing.

The results of measurements of the content of somatic cells in raw cow's milk are presented in Table 1.

Table 1

Monitoring of somatic cell content in raw cow's milk, M ± m, n = 12

№ in order	Season	Months	Number of somatic cells, thousand/cm^3	
			agri-food markets	spontaneous markets
1	Summer	June	420,0±3,5	420,5±3,0
		July	387,3±2,6	401,2±3,8
		August	395,5±3,1	407,3±2,5
2	Autumn	September	398,0±3,3	415,3±3,5
		October	425,5±3,2	525,8±4,3
		November	429,8±3,8	541,3±4,5
3	Winter	December	405,5±3,5	487,3±4,4
		Juniary	384,5±2,5	450,5±3,8
		February	387,4±3,3	475,2±4,1
4	Spring	March	393,3±3,1	508,5±4,1
		April	408,5±3,9	620,4±5,1
		May	404,5±3,1	604,3±5,1
Total			403,3±3,2	488,1±3,9

Thus, Table 1 shows that during the research period, samples of raw cow's milk, taken from the dairy buildings of the agro-food markets of Odesa, permanently had lower levels of somatic cell content. The average content of somatic cells in raw milk during the year was 403.3±3.2 thousand/cm^3, which is 21 % higher than the average annual content of somatic cells in raw milk from cows sold on spontaneous

markets. At the same time, certain dynamics were observed in the content of somatic cells in milk throughout the year, depending on the season.

The highest content of somatic cells in raw milk from agro-food markets was found in June, October, and November, respectively - 420.0±3.5; 425.5±3.2 and 429.8±3.8 thousand/cm^3. All these values, according to the current DSTU 3662:2018, correspond to first-grade raw milk. However, we attribute this to the peculiarities of the physiological state of dairy animals, which is confirmed by the data available in the literature [15]. During the 6-month research period, in this type of sample, the somatic cell content in raw milk did not exceed 400 thousand/cm^3, i.e. during July, August, September, January, February and March, the raw milk in terms of somatic cell content met the requirements of DSTU 3662:2018 of the highest grade.

Regarding the samples of raw cow's milk, which were collected at the natural markets of Odesa, during the research period the content of somatic cells in the samples was permanently higher compared to the samples of milk sold at agri-food markets. Thus, the average somatic cell count during June 2024-May 2025 was 488.1±3.9 thousand/cm^3. This indicator, according to the current DSTU 3662:2018, corresponds to first-grade raw materials. However, in October, November, March, April and May the content of somatic cells in milk was 525.8±4.3; 541.3±4.5; 508.5±4.1; 620.4±5.1; 604.3±5.1 thousand/cm3, respectively. These indicators exceed the values allowed for first-grade raw materials, which are allowed for use according to the current standard. In addition, milk with an increased content of somatic cells may pose a threat to the health of consumers, since the main reason for the increase in their content is the presence of subclinical mastitis in animals [7, 9, 15].

The obtained research results prove that the use of raw milk from natural markets is dangerous, because such raw materials are not subject to veterinary and sanitary inspection and may be obtained from sick animals. In addition, its implementation is carried out without compliance with sanitary and hygienic requirements, which leads to contamination of raw milk with pathogenic microflora, which is the cause of outbreaks of foodborne infections and toxicoinfections. The seasonal dynamics of the content of somatic cells in raw cow's milk is clearly shown in Fig. 1.

From Fig. 1 it becomes clear that the content of somatic cells is subject to seasonal dynamics, characterized by a significant increase in the indicator in the autumn (October-November) and spring (April-May) periods.

In the summer, the indicators in samples from agri-food markets and natural markets differ slightly, however, a significant discrepancy in values was noted in the period from September to May, with the maximum content of somatic cells in raw milk samples from natural markets in April-May 2025 - 620.4±5.1 and 604.3±5.1 thousand/cm^3, respectively, which indicates that the product does not meet the requirements of current standards and indicates that animals are affected by subclinical mastitis.

Conclusions and prospects for further research. Studies have shown that the content of somatic cells in raw cow milk is not constant throughout the year, which is due to the physiological processes that occur in the animal's body.

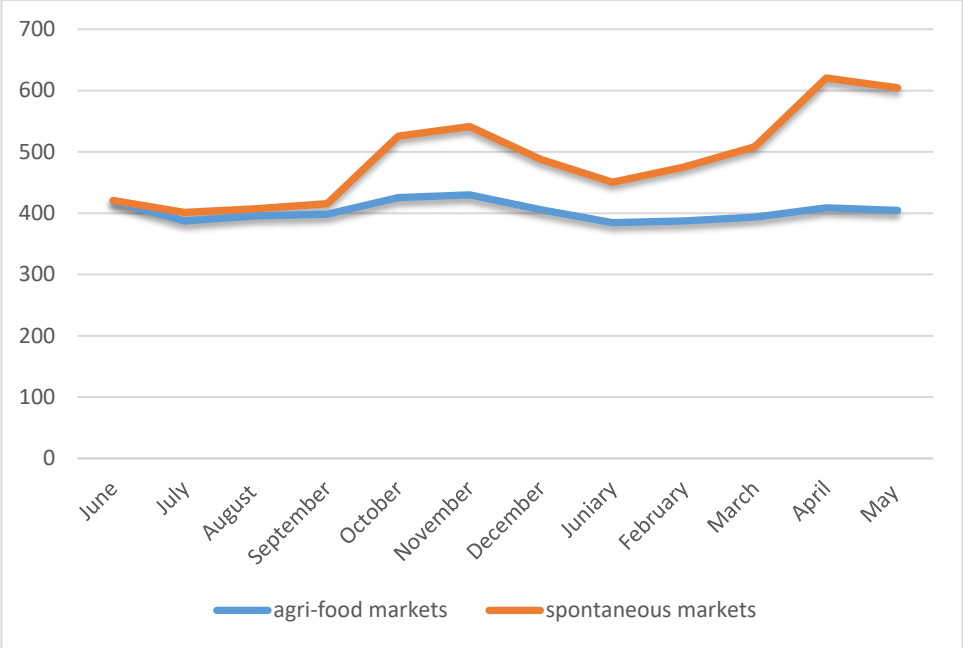

Figure 1 Comparison of somatic cell content indicators in raw cow's milk samples during 2024-2025 (figure of authores)

Raw cow's milk, which is sold on agri-food markets and undergoes veterinary and sanitary examination, is characterized by a lower content of somatic cells - 403.3±3.2 thousand/cm^3, because it is obtained from healthy animals, which is confirmed by veterinary documents. Such raw materials are safe for consumers.

Raw cow's milk, which is not sold in natural markets, in most cases does not meet the sanitary and hygienic requirements specified in the current DSTU 3662:2018. In particular, over the year, samples of such milk have a higher somatic cell content compared to samples taken at agri-food markets. In particular, the average annual content of somatic cells in such samples is 488.1±3.9 thousand/cm^3. Such raw materials in the fall (October-November) and spring (March-May) do not meet the requirements of the current standard for the content of somatic cells, and accordingly are unsafe for consumption by consumers, as they may be obtained from animals suffering from mastitis. In this regard, it is necessary to combat spontaneous markets at the state level, because the products sold in them can pose a threat to public health and cause outbreaks of foodborne infections and toxicosis.

Further research is planned to be devoted to studying the seasonal dynamics of the content of somatic cells in raw cow milk sold in the agri-food markets of the south of the Odesa region, which will make it possible to identify periods of the year when special attention should be paid during veterinary and sanitary examination to the detection of raw milk from cows suffering from subclinical mastitis.

Reference

1. Bazar O., Kukhtin M. D. Efficiency of pasteurization of raw milk with different microbial contamination. *Collection of abstracts of the VI International Scientific and Technical Conference "State and Prospects of Food Science and Industry".* 2022. P. 33-33.

2. Bernyk I. M. Innovative approach to obtaining high-quality raw milk. *Machinery, energy, transport, agro-industrial complex*. 2019. № 3 (106). P. 46-55.

3. Budilovich I. Why you shouldn't buy market milk. *Livestock of Ukraine*.2018. Iss. 2-3. P. 25-27.

4. Bukalova N. V., Prylipko T. M., Bogatko N. M., Lyasota V. P., Dzhmil V. I., Utechenko M. V., Bogatko L. M. Sanitary and hygienic control of the production of raw cow's milk and its microbiological analysis. *Tavria Scientific Bulletin. Series: Technical Sciences.* 2022. Iss. 3. P. 119-127.

5. Vinyukov A. O., Vinyukov, O. O. Factors influencing the incidence of mastitis in cows. *Animal breeding and genetics*. 2018. Iss. 56. P. 17-24.

6. Gavura V. M. Research of milk for mastitis in the private and public sectors at milk reception points. *Veterinary Medicine of Ukraine*. 2015. Iss. 3. P. 36.

7. Karavanskyi M., Rud V., Tarasenko L. The level of somatic cells in cow's milk as an important indicator of its safety. *Agrarian Bulletin of the Black Sea Littoral: Collection of Scientific Proceedings*. 2021. Iss. 101. P. 44-47.

8. Karpova D. V., Zazharska N. V. Improving measures to control the safety and quality of cow's milk. *Modern approaches to ensuring the safety and quality of livestock products: materials of the International Scientific and Practical Conference of NPP and Young Scientists (Odesa, December 6-7, 2022). P*. 200-202.

9. Kasyanchuk V. V., Bergilevych O. M., Sklyar O. I., Marchenko A. M., Teryokhina, O. V. The relationship between the number of somatic cells and the disease of cows with subclinical mastitis of staphylococcal and coliform etiology. *Bulletin of the Sumy National Agrarian University. Series: Veterinary Medicine*. 2015. Iss. 1. P. 72-77.

10. Mazurkevych A. Y., Hryshchuk A. V., Hryshchuk I. A. Mastitis – a current problem of dairy herds. *Bulletin of the Dnipropetrovsk State Agrarian and Economic University.* 2017. Iss. 3. P. 82-84.

11. Murska S. D. Modern scientific approaches to ensuring milk quality and developing safe antibiotics-free means for treating cows with mastitis. *Scientific Bulletin of the S. Z. Gzhytsky Lviv National University of Veterinary Medicine and Biotechnology. Series: Veterinary Sciences*. 2016. Iss. 18, № 1. P. 205-220.

12. Nadtochiy V. M. Monitoring milk quality and cow milking hygiene. *Modern approaches to ensuring the safety and quality of livestock products: materials of the International Scientific and Practical Conference of NPP and Young Scientists (Odesa, December 6-7, 2022).* P. 116-119. URL: https://surl.li/dzlqio

13. Novgorodska N. V., Blaschuk V. V. Problems of milk quality in Ukraine. *Scientific Bulletin of the Lviv National University of Veterinary Medicine and Biotechnology named after Gzhytsky.* 2015. Iss. (17, № 1 (4)). P. 72-76.

14. Ordin Yu. M., Ivachenko B. P., Eroshenko O. V. Comparative evaluation of modern methods for diagnosing subclinical mastitis in cows. *Nauk. visnyk vet. medzyniec: zb-k nauk. prts.* Bila Tserkva: BNAU. 2024. Iss. 1. P. 21-27.

15. Paliy A. P., Paliy A. P., Mykhalchenko S. A. Establishment of qualitative indicators of milk of cows suffering from mastitis. *Scientific and technical bulletin of the Institute of Animal Husbandry of the NAAS.* 2022. Iss. 127. P. 130-138.
16. Panevnyk V. Cellular composition of milk of healthy and mastitis-stricken cows. *Agrarian science and education of Podillia*. 2017. P. 343-345.
17. Piven O. T., Barchenko O. S. Monitoring the quality of cow's milk sold at the agro-industrial market of the city of Haisyn, Vinnytsia region. *Current aspects of the development of science and education: collection of materials of the III International Scientific and Practical Conference (Odesa, November 9-10, 2023).* Odesa, OSAU. 2023. P. 106-108.
18. Suprovych T., Suprovych M., Panevnyk V. Somatic cells of milk and allelic polymorphism of the BoLA-DRB3 gene in cows with mastitis. *Abstracts of the reports of the IV International Scientific and Technical Conference "State and Prospects of Food Science and Industry*". 2017. P. 40-41.
19. Tyshkivska N. V. Morphological composition of cow's milk with subclinical mastitis. *Scientific Bulletin of the National University of Life Resources and Environmental Management of Ukraine. Series: Veterinary Medicine, Quality and Safety of Livestock Products*. 2015. Iss. 221. P. 135-138.
20. Sharakhmatova T., Dyudina I., Izbrash E. The HACCP system in solving the problems of milk production as raw material. *Food Industry of the Agricultural Complex.* 2017. Iss. 5. P. 34-37.
21. Alhussien M. N., Dang A. K. Milk somatic cells, factors influencing their release, future prospects, and practical utility in dairy animals: An overview. *Veterinary world*. 2018. 11(5). P. 562.
22. Deshapriya R. M. C., Rahularaj R., Ransinghe R. M. S. B. K. Mastitis, somatic cell count and milk quality: An overview. *Sri Lanka Veterinary Journal.* 2019. Vol. 66(1). P. 1-12.
23. Ivanov G. Y., Bilgucu Ertugrul., Balabanova T. B., Ivanova I. V., Uzatici Ahmet. Effect of animal breed, season and milk production scale on somatic cell count and composition of cow milk. *Bulgarian Journal of Agricultural Science.* 2017. Vol. 23(6). P. 1047-1052.
24. Kaskous S. Physiological Aspects of milk somatic cell count in dairy cattle. *Int. J. Livest. Res*. 2021. Vol. 11. P. 1-12.
25. Sahin A., Yildirim A., Ulutas Z. Effect of various environmental factors and management practices on somatic cell count in the raw milk of Anatolian Buffaloes. Pakistan J. Zool., Vol. 48(2), 2016. P. 325-332.
26. Talukder M., Ahmed H. M. Effect of somatic cell count on dairy products: a review. *Asian Journal of Medical and Biological Research*. 2017. Vol. 3(1). P. 1-9.

Ольга Півень,
кандидат ветеринарних наук, доцент, доцент кафедри інфекційної патології, біобезпеки та ветеринарно-санітарного інспектування імені професора В. Я. Атамася
Одеський державний аграрний університет, Одеса, Україна
ORCID ID 0000-0001-8168-1677
e-mail: olhapiven@gmail.com

Альона Присяжнюк,
здобувач другого (магістерського) рівня вищої освіти 6-го курсу, ОП «Ветеринарна гігієна, санітарія і експертиза»
Одеський державний аграрний університет, Одеса, Україна
ORCID ID 0009-0005-8626-6057
e-mail: uvhtdvf79@gmail.com

СЕЗОННА ДИНАМІКА ВМІСТУ СОМАТИЧНИХ КЛІТИН У МОЛОЦІ КОРІВ З ПРИСАДИБНИХ ГОСПОДАРСТВ

Анотація

У статті представлено результати проведеного моніторингу сезонної динаміки вмісту соматичних клітин у молоці-сировині коров'ячому протягом 2024-2025 років. Протягом дослідного періоду було досліджено зразки молока-сировини коров'ячого, відібрані на агропродовольчих ринках м. Одеси, а також зразки молока-сировини коров'ячого, відібрані на стихійних ринках міста. Отримані результати досліджень показали, що більшу частину року зразки молока-сировини коров'ячого, які реалізуються на агропродовольчих ринках м. Одеси, за вмістом соматичних клітин, відповідають вимогам щодо сировини вищого гатунку, згідно чинного в Україні стандарту ДСТУ 3662:2018 «Молоко-сировина коров'яче. Технічні вимоги», який регламентує безпечність та якість цього продукту тваринного походження. Зокрема, встановлено, що найбільшу кількість соматичних клітин у молоці-сировині коров'ячому з агропродовольчих ринків виявлено протягом червня, жовтня й листопада відповідно – 420,0±3,5; 425,5±3,2 і 429,8±3,8 тис/см^3. Усі ці значення, згідно чинного ДСТУ 3662:2018, відповідають молоку-сировині першого гатунку. У той же час, зразки молока-сировини коров'ячого зі стихійних ринків м. Одеси, у більшості випадків, можна віднести до першого гатунку та негатункової сировини. Окрім того, у ході дослідження встановлено підвищення вмісту соматичних клітин у обох видах проб молока-сировини коров'ячого восени (період із жовтня по листопад) та у весняну пору (квітень-травень). Так, середній вміст соматичних клітин у молоці-сировині коров'ячому, що реалізується на стихійних ринках м. Одеси, перевищує середні річні показники у зразках, відібраних на агрпродовольчих ринках, на 21 %. Підвищення вмісту соматичних клітин у молоці-сировині коров'ячому у більшості випадків пов'язано із наявністю у дійного поголів'я субклінічних маститів, які часто не мають виражених клінічних проявів, однак молоко від таких тварин є небезпечним для вживання людиною й тваринами, адже містить підвищену кількість мікроорганізмів. Представлені результати дослідження також довели доцільність боротьби із стихійними ринками, бо продукція, яка на них реалізується, не піддається ветеринарно-санітарному інспектуванню, та у більшості випадків становить загрозу для здоров'я споживачів, спричиняючи спалахи харчових інфекцій та токсикозів.

Ключові слова: *дійне стадо, здоров'я стада, соматичні клітини, стихійні ринки, бактеріальне забруднення молока, субклінічний мастит.*

Reference

1. Bazar, O., & Kukhtyn, M. (2022). Efficiency of pasteurization of raw milk with various microbial contamination. *Collection of abstracts of the VI International scientific and technical conference "State and prospects of food science and industry"*, 33-33.
2. Bernyk, I. M. (2019). Innovative approach to obtaining high-quality raw milk. *Machinery, energy, transport, agro-industrial complex, (3(106)), 46-55.*

3. Budilovich, I. (2018). Why you shouldn't buy market milk. *Livestock farming in Ukraine*, (2-3), 25-27.
4. Bukalova, N. V., Prylipko, T. M., Bogatko, N. M., Lyasota, V. P., Dzhmil, V. I., Utechenko, M. V., & Bogatko, L. M. (2022). Sanitary and hygienic control of the production of raw cow's milk and its microbiological analysis. *Tavria Scientific Bulletin. Series: Technical Sciences*, (3), 119-127.
5. Vinyukov, A. O., & Vinyukov, O. AT. (2018). Factors influencing the incidence of mastitis in cows. *Animal breeding and genetics*, (56), 17-24.
6. *reports of the IV International scientific and technical conference "State and prospects of food science and industry",* 40-41.
7. Tyshkivska, N. V. (2015). Morphological composition of cow milk with subclinical mastitis. *Scientific Bulletin of the National University of Life Resources and Environmental Management of Ukraine. Series: Veterinary Medicine, Quality and Safety of Livestock Products*, (221), 135-138.
8. Sharakhmatova, T., Dyudina, I., & Izbrash, E. (2017). HACCP system in solving problems of raw milk production. Food industry, agro-industrial complex, (5), 34-37.
9. Alhussien, M. N., & Dang, A. K. (2018). Milk somatic cells, factors influencing their release, future prospects, and practical utility in dairy animals: An overview. *Veterinary world*, *11*(5), 562.
10. Deshapriya, R. M. C., Rahularaj, R., & Ransinghe, R. M. S. B. K. (2019). Mastitis, somatic cell count and milk quality: An overview. *Sri Lanka Veterinary Journal*, *66*(1).
11. Ivanov, G. Y., Bilgucu, E. R. T. U. G. R. U. L., Balabanova, T. B., Ivanova, I. V., & Uzatici, A. H. M. E. T. (2017). Effect of animal breed, season and milk production scale on somatic cell count and composition of cow milk. *Bulgarian Journal of Agricultural Science*, *23*(6), 1047-1052.
12. Kaskous, S. (2012). Physiological Aspects of milk somatic cell count in dairy cattle. *Int. J. Livest. Res*., (11), 1-12.
13. Sahin, A., Yildirim, A., & Ulutas, Z. (2016). Effect of various environmental factors and management practices on somatic cell count in the raw milk of Anatolian Buffaloes. *Pakistan J. Zool*., (48(2)), 325-332.
14. Talukder, M., & Ahmed, H. M. (2017). Effect of somatic cell count on dairy products: a review. Asian Journal of Medical and Biological Research, 3(1), 1-9.

Стаття надійшла до редакції 30 травня 2025 року.
Стаття пройшла рецензування 12 червня 2025 року.
Стаття опублікована 30 червня 2025 року.