

ISSN 2518–7554 print  
ISSN 2518–1327 online

**НАУКОВИЙ ВІСНИК**  
**ЛЬВІВСЬКОГО НАЦІОНАЛЬНОГО УНІВЕРСИТЕТУ**  
**ВЕТЕРИНАРНОЇ МЕДИЦИНИ ТА БІОТЕХНОЛОГІЙ**  
**імені С.З. ГЖИЦЬКОГО**

**СЕРІЯ: ВЕТЕРИНАРНІ НАУКИ**



**SCIENTIFIC MESSENGER**  
**OF LVIV NATIONAL UNIVERSITY OF VETERINARY**  
**MEDICINE AND BIOTECHNOLOGIES**

**SERIES: VETERINARY SCIENCES**

**Том 24 № 108**  
**2022**

Науковий вісник Львівського національного університету ветеринарної медицини та біотехнологій імені С. З. Гжицького. Серія: Ветеринарні науки входить до "Переліку наукових фахових видань України" (категорія Б), в яких можуть публікуватися результати дисертаційних робіт на здобуття наукових ступенів доктора і кандидата наук у галузі ветеринарних наук (остання пере-реєстрація згідно з наказом Міністерства освіти і науки України № 1301 від 15 жовтня 2019 р.).  
Свідчення про державну реєстрацію друкованого засобу масової інформації серія КВ № 14133–3104 ПР від 11.06.2008 року.

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Scientific messenger of Lviv National University of Veterinary Medicine and Biotechnologies.

Series: Veterinary sciences

includes in the "List of scientific professional publications of Ukraine", which can be published the results of dissertations for the degree of doctor and candidate of Science in Veterinary Science (last re-registration under the order of the Ministry education of Ukraine number 1301 of October 15, 2019)

Certificate of registration of print media Series KV number 14133–3104 PR from 11.06.2008 year.

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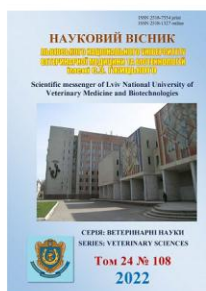
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Науковий вісник Львівського національного університету  
ветеринарної медицини та біотехнологій імені С.З. Гжицького.

Серія: Ветеринарні науки

Scientific Messenger of Lviv National University  
of Veterinary Medicine and Biotechnologies.

Series: Veterinary sciences

ISSN 2518-7554 print  
ISSN 2518-1327 online

doi: 10.32718/nvlvet10829  
<https://nvlvet.com.ua/index.php/journal>

UDC 619:616-078.995.1.636.22/.28

## Bacteriological study of the liver of cattle for dicroceliosis

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### Article info

Received 15.09.2022  
Received in revised form  
17.10.2022  
Accepted 18.10.2022

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*Plys, V. M., & Butenko, K. R. (2022). Bacteriological study of the liver of cattle for dicroceliosis. Scientific Messenger of Lviv National University of Veterinary Medicine and Biotechnologies. Series: Veterinary sciences, 24(108), 198–202. doi: 10.32718/nvlvet10829*

The article presents the results of organoleptic and microbiological studies of the chilled liver of cattle affected by the helminth *Dicrocoelium lanceatum*. The main goal was to determine how temperature regimes affect the quality and safety of the liver of cattle affected by dicrocelia and its contamination with microflora. An organoleptic examination of all animal slaughter products was carried out. According to organoleptic indicators, meat products did not differ from healthy ones, and only liver damage was noted. The liver is filled with blood, and the edges are dulled, the gallbladder is enlarged and filled with dark green bile, mucus and helminths. It was established that the liver is contaminated with microorganisms of the Enterobacteriaceae family, which were found on the 8th day of storage. Storage of the liver at a temperature of 0 °C for a day in samples No. 1, 4, 5 revealed bacteria of the *Escherichia coli* group, which increased by 27.7 % in the first sample; in the fourth for 10 days – by 16.1 %; 15 days in the 5th sample – by 10.8 % compared to the control, and also in the fifth sample *Proteus vulgaris* was isolated, which was 17.4 % and *Staphylococcus aureus* – 13.5 %. In the third tested sample, on the 8th day, bacteria of the *Staphylococcus aureus* species were found, which was 41.6 %. With a weak intensity of liver damage and contamination with the microflora of 31 CFU/cm<sup>3</sup>, slaughter products, namely the affected parts of the liver, are sent for disposal, and the non-affected parts of the liver and carcass are subjected to heat treatment and released for sale without restrictions. Following the current normative documents DSTU 4831:2006, DSTU 7444:2013, and DSTU ISO 6888-1:2003, with a high intensity of infestation, as well as in slaughter products, including liver, for the detection of more than 30 CFU/cm<sup>3</sup>, such a slaughter product is considered not fresh and subject to disposal. During the storage of beef liver for 15 days at a temperature of 0 °C, certain changes were detected, namely: the parenchyma of the organ is gray, has an unpleasant smell, the surface is covered with mucus, the consistency is flabby, the pit does not align when pressed with a finger.

**Key words:** dicroceliosis, cattle liver, microflora, bacteriological studies.

### Introduction

Meat and meat products in human nutrition play an essential role due to constant physical and intellectual stress (Basarab et al., 2015; Kotelevych, 2016; Vyslotska et al., 2021). To provide energy, a person needs to consume 100–120 g of meat daily to provide the human body with high-quality and safe food products that contain sufficient amounts of amino acids, minerals, and vitamins (Khimich et al., 2017; Bogatko, 2020).

Meat, the primary source of animal protein (Khalak & Gutyj, 2022; Khalak et al., 2022; Povod et al., 2022), is challenging to replace. Still, apart from it, there is the most valuable product that contains less protein but more various nutrients and hemoglobin, it is the liver.

Beef liver is one of the main organs, which contains essential substances for building and maintaining the vital activity of the body, namely: fatty acids (dozahexanoic, eicosapentaenoic, arachinic), rich in vitamins C, D, E, K, B, most of all vitamin A and B<sub>12</sub>. Of the minerals, iron, sodium, magnesium, phosphorus, calcium, potassium, zinc, and selenium are the most abundant. The latter are enzymes, amino and fatty acids.

The quality and safety of the liver depend on many factors, first of all, the presence of parasites (trematodes).

On the territory of Ukraine, an increase in the number of outbreaks of ruminant dicroceliosis is observed, the causative agent of which is the trematode of the species *Dicrocoelium lanceatum*. With a high degree of damage, an increase in the liver, growth of the network of bile ducts, and the presence of helminths are detected. With a



small lesion, the walls of the bile ducts are expanded, filled with the bile of a liquid consistency, and the presence of helminths. But at any intensity of damage, helminths release waste products that reduce the animal's resistance and create favorable conditions for the development of microflora, which can lead to food poisoning (Liu et al., 2016).

Scientist Pinar Şanlıbaba isolated a strain of *Staphylococcus aureus* from raw red meat of cattle and sheep. The leading research was to isolate and identify the strain using morphological and molecular methods. He also screened 9 genes of staphylococcal enterotoxin by polymerase chain reaction.

The authors (Salata et al., 2017) studied the dynamics of microbiological changes in frozen and chilled beef under different temperature regimes.

V. A. Brodovsky established that the contamination of meat and liver depends on the intensity of the infestation. He also discovered the influence of parasitic diseases on the safety of slaughter products (Brodovskiy, 2015).

V. Z. Salata, based on his research, found that beef storage at low temperatures causes psychotropic microflora to die, and the number of fungi and yeasts increases (Salata, 2017).

Scientists (Kuhtyn et al., 2021) established the temperature regimes of beef storage at which there is no violation of biochemical properties and no signs of spoilage.

Scientists from far abroad studied the effect of dry cooling on the microflora of beef carcasses Jasmine Kataria, Sasikala Vaddu, Estefania Novoa Rama, Gaganpreet Sidhu, Harshavardhan Thippareddi, and Manpreet Singh studied the effect of acids on the microflora of beef. As a result, it was established that precisely with this method, it is possible to achieve a two-fold reduction of aerobes, coliforms, and BGCP.

Scientists (McShary et al., 2021) proposed using alternative modes of beef cooling to accelerate the throughput of plants and improve logistics if necessary.

That is why the question arose regarding the mandatory bacteriological research of the chilled liver of cattle affected by the helminth species *Dicrocoelium lanceatum* for detecting microflora contamination under different storage temperature regimes.

#### The purpose of the work

Is to carry out a veterinary and sanitary examination and determine the bacterial contamination of cattle slaughter products with dicrocoeliosis under different storage temperature regimes.

#### Material and methods

The research was conducted during 2021–2022 based on the Dnipropetrovsk Regional State Service of Ukraine for Food Safety and Consumer Protection in the Bacteriological Department and the Dnipro State Agrarian and Economic University at the Department of Parasitology and Veterinary-Sanitary Examination.

Sampling for microbiological research was carried out following DSTU 7992-2015 “Meat and meat raw

materials. Methods of sampling and organoleptic assessment of freshness”.

Samples were taken from private farms weighing at least 200 g and measuring 8 cm × 10 cm × 10 cm.

Samples were prepared for microbiological research in accordance with DSTU 7963:2015 “Food products. Preparation of samples for microbiological analyzes” (flammability of sample surfaces, sampling, weighing, grinding of samples, etc.).

Equipment, reagents, and media were prepared according to DSTU ISO 7218.

Bacteriological studies were carried out according to generally accepted methods and under the regulatory and technical documentation DSTU 8381:2015 “Meat and meat products. Organization and methods of microbiological research”.

Cultures were carried out on simple and enriched nutrient media for cultivation, accumulation, and differentiation: lactose agar with diamond green and phenol red, lactose broth with diamond green and bile, McConkey broth, Kessler broth, Endo medium, Palkam agar, nutrient medium ALOA, meat peptone agar, egg yolk salt agar and egg yolk azide agar. In addition, bacteriological studies were carried out according to the generally accepted scheme and methods.

Detection of microorganisms, namely *Escherichia coli*, *Salmonella* spp., *Listeria monocytogenes*, *Staphylococcus aureus* was carried out following current state standards: (KMAFAnM) was determined according to DSTU ISO 4833, *Escherichia coli* DSTU ISO 4831:2006; *Salmonella* spp. according to DSTU ISO 12824; *Listeria monocytogenes* according to DSTU ISO 11290-1:2003; *Staphylococcus aureus* according to DSTU ISO 6888-1:2003.

Endo's medium was used to isolate *Escherichia coli* bacteria. Nutrient media for the isolation of *Proteus vulgaris* used meat peptone agar, which is prepared according to DSTU 7444:2013. *Staphylococcus aureus* was determined on meat peptone agar according to DSTU ISO 6888-1:2003.

After thermostatic the crops, a quantitative and qualitative study of the nature of the growth of microorganisms on nutrient media was carried out.

The analysis of the obtained results, particularly the identification of microorganisms, was carried out per DSTU ISO 7218 and the bacteria identifier “Berdzhi”.

#### Results and discussion

For the study, 5 samples of affected liver were selected from the private sector of the Novomoskovskiy district of the Dnipropetrovsk region, weighing 200 g. Before experimenting, the samples were subjected to organoleptic evaluation.

During the organoleptic examination, meat products did not differ significantly from healthy ones, but liver damage was noted. The liver is enlarged in size and dense in consistency. The color of the capsule is greenish, filled with blood, and the edges are blunted. The gall bladder is enlarged and filled with dark green bile, mucus, and helminths. The bile ducts are thickened, widened, and filled with thick dark greenish-yellow bile and marites.

With a weak lesion, the capsule of the liver is elastic. The fossa is quickly leveled when pressed, the section's color is light brown, and the bile ducts are expanded and filled with a few helminths. The liver of clinically healthy cattle has an elastic consistency, and dark brown color, on a section of the liver parenchyma and bile ducts without visible changes.

We were faced with the objectivity of the assessment of the affected liver, which was subject to cleaning from detected pathological changes and carrying out bacteriological studies to detect contamination, which, in the absence of insemination, is carried out without restrictions.

Our next step was to determine the contamination of cattle slaughter products with microorganisms, namely

the liver. The research was conducted following DSTU 8381:2015 "Meat and meat products. Organization and methods of microbiological research". It was stained by the Gram method.

The results of bacteriological studies shown in Table 1 indicate contamination of the liver with microorganisms of the Enterobacteriaceae family. When the liver was stored at a temperature of 0 °C for a day in samples No. 1, 4, 5, bacteria of the *Escherichia coli* group were detected, which increased by 27.7 % in the first sample; in the fourth for 10 days – by 16.1 %; 15 days in the 5th sample – by 10.8 %, and in the fifth sample *Proteus vulgaris* was isolated, which was 17.4 % and *Staphylococcus aureus* - 13.5 %. *Staphylococcus aureus* was found in the third examined sample on the 8th day, which was 41.6 %.

**Table 1**

Microbiological indicators of the chilled liver, which was stored for a particular time at a temperature of 0 ± 0.5 °C, CFU/cm<sup>3</sup>

Sample №	Isolated microflora	Storage time of meat products	Number of microorganisms
1	<i>Escherichia coli</i>	1 day	18 KYO/cm <sup>3</sup>
2	<i>Proteus vulgaris</i>	5 days	15 KYO/cm <sup>3</sup>
3	<i>Staphylococcus aureus</i>	8 days	12 KYO/cm <sup>3</sup>
4	<i>Escherichia coli</i>	10 days	31 KYO/cm <sup>3</sup>
5	<i>Escherichia coli</i>	15 days	46 KYO/cm <sup>3</sup>
	<i>Proteus vulgaris</i>		29 KYO/cm <sup>3</sup>
	<i>Staphylococcus aureus</i>		37 KYO/cm <sup>3</sup>

Keeping the beef liver for 15 days at a temperature of 0 °C, the following changes were observed: the parenchyma of the organ was gray, had an unpleasant smell, the surface was covered with mucus, the consistency was flabby, the pit did not align when pressed with a finger.

Due to the mechanical and toxic effect of the trematode species *Dicrocoelium lanceatum* and the inoculated microflora of the liver, its hilly surface is enlarged, lesions in the form of limited white spots are visible, a chronic inflammatory process develops in the bile ducts, which leads to thickening of the walls and expansion of the bile ducts.

According to DSTU 7444:2013, for the isolation of a microorganism of the species *Proteus vulgaris* for 5 days is – 15 CFU/cm<sup>3</sup>, DSTU ISO 6888-1:2003 – *Staphylococcus aureus* for 8 days is – 12 CFU/cm<sup>3</sup> and DSTU ISO 4831:2006 – *Escherichia coli* on the 10th day is – 31 CFU/cm<sup>3</sup>. Therefore, with a weak intensity of liver damage and microflora contamination of 31 CFU/cm<sup>3</sup>, slaughter products, namely the affected liver, are sent for disposal, and the non-affected parts of the liver and carcass are subjected to heat treatment and released for sale without restrictions.

Following the current regulatory documents DSTU ISO 4831:2006, DSTU 7444:2013, and DSTU ISO 6888-1:2003 for high-intensity of infestation, as well as in slaughter products, including liver, for the detection of more than 30 CFU/cm<sup>3</sup> of such a slaughter product is considered not fresh and must be disposed of.

Human consumption of slaughter products that have not been tested for microbiological insemination and

long-term storage of 15 and more than 15 days at a temperature of 0 °C, insufficiently subjected to heat treatment, may lead to food poisoning in the consumer.

### Conclusions

1. Bacteriological studies of slaughter products, namely cattle livers, indicate significant insemination of *Escherichia coli*, *Proteus vulgaris*, and *Staphylococcus aureus* after 5 days of storage at a temperature of 0 °C. Further storage of such raw materials will deteriorate the quality and safety of slaughter products.

2. The liver affected by the *Dicrocoelium lanceatum* helminth and contaminated with microorganisms is not allowed for sale.

### Conflict of interest

The authors claim that there is no conflict of interest.

### References

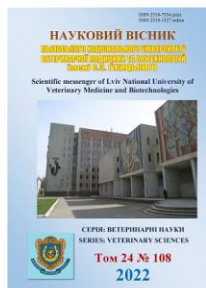
- Basarab, I., Paska, M., Romashko, I., & Moldavanova, L. (2015). Comparison of quality red meat derived from cattle and small cattle. *Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies. Series: Food Technologies*, 17(4), 3–5. URL: <https://nvlvet.com.ua/index.php/food/article/view/3240>.
- Bogatko, N. (2020). Sanitary and hygienic condition of refrigerators and facilities for storage of meat of slaughtered animals at the powers of their production and circulation. *Scientific Messenger of LNU of Veterinary*



- Medicine and Biotechnologies. Series: Veterinary Sciences, 22(99), 8–19. DOI: 10.32718/nvlvet9902.
- Brodovskiy, V. A. (2015). Veteryarno-sanitarna otsinka miasa i subproduktiv otrymanykh vid zaboiu velykoi rohatoi khudoby urazhenoi fastsiol vozom ta dykrotseliozom. *Naukovyi visnyk LNUVMBT imeni S.Z. Gzhytskoho*, 17(61), 220–226 (in Ukrainian).
- Khalak, V. I., & Gutyj, B. V. (2022). Feeding and meat qualities of young pigs of different genotypes according to melanocortin 4 receptor (Mc4r) gene and interbreed differentiation according to the coefficient of decrease in growth intensity in early ontogenesis. *Ukrainian Journal of Veterinary and Agricultural Sciences*, 5(3), 3–8. DOI: 10.32718/ujvas-3.01.
- Khalak, V. I., & Gutyj, B. V. (2022). Level of phenotypic manifestation of feeding and meat qualities of young pigs of different intrabreed differentiation according to some multi-component evaluation indexes. *Ukrainian Journal of Veterinary and Agricultural Sciences*, 5(1), 66–70. DOI: 10.32718/ujvas5-1.11.
- Khalak, V. I., Gutyj, B. V., & Bordun, O. M. (2022). Innovative methods of evaluation of sows by indicators of reproductive qualities and criteria for their selection by some multicomponent mathematical models. *Scientific Messenger of Lviv National University of Veterinary Medicine and Biotechnologies. Series: Agricultural sciences*, 24(96), 70–77. DOI: 10.32718/nvlvet-a9609.
- Khalak, V. I., Gutyj, B. V., Bordun, O. M., Stadnytska, O. I., Shostya, A. M., Usenko, S. O., Kuzmenko, L. M., Zasukha, L. V., Myronenko, O. I., & Karunna, T. I. (2022). Reproductive Qualities of Sows of Different Genotypes by Melanocortin - 4 (MC4R) Receptor Gene and Economic Efficiency of Their Use. *Journal of Mountain Agriculture on the Balkans*, 25(4), 1–15.
- Khalak, V. I., Hutyi, B. V., & Bordun, O. M. (2022). Vidtvoriuvalni yakosti svynomatok plusadaptivnoho, modalnoho ta minusadaptivnoho typiv, yikh minlyvist ta koreliatsiyni zviazok. *Visnyk Sums'koho natsionalnoho ahrahnoho universytetu. Seriya "Tvarynystvo"*, 2(49), 68–73 (in Ukrainian).
- Khalak, V. I., Stadnytska, O. I., Gutyj, B. V., Stryzhak, T., Bordun, O. M., Shostya, A. M., Usenko, S. O., Voloshchuk, V. M., Ilchenko, M. O., & Pundyk, V. P. (2022). Level of Phenotypic Exhibition of Polygenic Heritable Signs of Young Pigs of Different Intrabreed Differentiation by Integrated Significant. *Journal of Mountain Agriculture on the Balkans*, 25(5), 1–11.
- Khalak, V. I., Gutyj, B. V., Leskiv, Kh. Ya., Bordun, O. M., & Saienko, A. M. (2022). Feeding and meat quality of young pigs of different genotypes by the melanocortin 4 receptor gene (mc4r) and the economic efficiency of their use. *Colloquium-journal*, 21(144), 20–23. DOI: 10.24412/2520-6990-2022-21144-20-23.
- Khalak, V., Bankovska, I., & Gutyj, B. (2022). Pig biology: serum enzymes and their correlation with physicochemical properties and chemical composition of muscle tissue. *Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies. Series: Agricultural Sciences*, 24(97), 92–98. DOI: 10.32718/nvlvet-a9716.
- Khalak, V., Gutyj, B., & Denysiuk, O. (2022). Some parameters of the interior and productivity of young beef cattle. *Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies. Series: Agricultural Sciences*, 24(96), 131–138. DOI: 10.32718/nvlvet-a9618.
- Khalak, V., Gutyj, B., Il'chenko, M., Shostya, A., Usenko, S., & Petulko, P. (2022). Efficiency of using some poly-component mathematical models of selection indices for evaluation of young pigs for fattening and meat qualities. *Bulletin of Poltava State Agrarian Academy*, 2, 197–204. DOI: 10.31210/visnyk2022.02.23.
- Khalak, V., Gutyj, B., Pundyk, V., Bezalychna, O., & Husiatynska, O. (2022). Feeding and meat quality young pigs of different interbreed differentiation according to the tyler index and economic efficiency of their use. *Scientific practice: modern and classical research methods*, 16, 60–63.
- Khimich, M., Gorobei, A., Kozulin, F., & Zhekov, V. (2017). Monitoring of safety and quality products slaughter of pigs obtained in Odessa region. *Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies. Series: Veterinary Sciences*, 19(77), 148–152. DOI: 10.15421/nvlvet7732.
- Kotelevych, V. (2016). Veterinary–sanitary inspection and veterinary–sanitary assessment of meat rabbits of different age groups, grown in the private sector Emilchino village, Yemelchinskyy district, Zhytomyr region. *Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies. Series: Veterinary Sciences*, 18(3(70)), 153–156. DOI: 10.15421/nvlvet7036.
- Kuhtyn, M., Salata, V., Boltyk, N., Ruschyn's'ka, T., Kryzhaniv's'kyj, Ja., Klymyk, V., Kovalenko, V., & Malimon, Z. (2021). Characteristics of frozen beef according to biochemical and microbiological parameters. *Visnyk Ahrahnoi Nauky*, 99(4), 36–43. DOI: 10.31073/agrovisnyk202104-05.
- Liu, Y., Youssef, M. K., & Yang, X. (2016). Effects of Dry Chilling on the Microflora on Beef Carcasses at a Canadian Beef Packing Plant. *Journal of Food Protection*, 79(4), 538–543. DOI: 10.4315/0362-028x.jfp-15-476.
- McSharry, S., Koolman, L., Whyte, P., & Bolton, D. (2021). The microbiology of beef from carcass chilling through primal storage to retail steaks. *Current Research in Food Science*, 4, 191–199. DOI: 10.1016/j.crf.2021.03.002.
- Povod, M. G., Opara, V. O., Mykhalko, O. G., Povoznikov, M. G., Lykhach, V. Y., Voshchenko, I. B., Gutyj, B. V., & Moisei, I. S. (2022). Effectiveness of using high-protein sunflower concentrate in pig feeding. *Scientific Messenger of Lviv National University of Veterinary Medicine and Biotechnologies. Series: Agricultural sciences*, 24(97), 3–15. DOI: 10.32718/nvlvet-a9701.
- Povod, M., Mykhalko, O., Gutyj, B., Mironenko, O., Verbelchuk, S., Koberniuk, V., & Tkachuk, O. (2022). Dependence of the microclimate parameters of the pig house on different frequency of manure pits emptying and outdoor temperature. *Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development"*, 22(4), 603–616. URL: [https://managementjournal.usamv.ro/pdf/vol.22\\_4/Art65.pdf](https://managementjournal.usamv.ro/pdf/vol.22_4/Art65.pdf).

- Povod, M., Mykhalko, O., Povochnikov, M., Gutyj, B., Koberniuk, V., Shuplyk, V., Ievstafieva, Y., & Buchkovska, V. (2022). Efficiency of using high-protein sunflower meal instead of soybean meal in feeding of growing piglets. *Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development"*, 22(4), 595–602. URL: [https://managementjournal.usamv.ro/pdf/vol.22\\_4/Art64.pdf](https://managementjournal.usamv.ro/pdf/vol.22_4/Art64.pdf).
- Salata, V. (2017). Microbiological characteristics of frozen beef during storage. *Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies*, 19(82), 25–29. DOI: 10.15421/nvlvet8206.
- Salata, V., Kuhtyn, M., Semanjuk, V., & Perkij, Y. (2017). Dynamics of microflora of chilled and frosted beef during storage. *Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies*, 19(73), 178–182. DOI: 10.15421/nvlvet7337.
- Vyslotska, L., Gutyj, B., Kozenko, O., Khalak, V., Chornyj, M., Martyshuk, T., Krempa, N., Vozna, O., & Todoruk, V. (2021). System of antioxidant protection of the body of piglets under the action of feed additive "Sylimevit". *Scientific Messenger of LNU of Veterinary Medicine and Biotechnologies. Series: Veterinary Sciences*, 23(104), 10–17. DOI: 10.32718/nvlvet10402.
- Yakubchak, O. M., Khomenko, V. I., Melnychuk, S. D. та in. (2005). *Veterynarno-sanitarna ekspertyza z osnovamy tekhnolohii i standartyzatsii produktiv tvarynnytstva*; Za red. O.M. Yakubchak, V.I. Khomenko. Kyiv (in Ukrainian).





**Науковий вісник Львівського національного університету  
ветеринарної медицини та біотехнологій імені С.З. Гжицького.  
Серія: Ветеринарні науки**

**Scientific Messenger of Lviv National University  
of Veterinary Medicine and Biotechnologies.**

**Series: Veterinary sciences**

ISSN 2518–7554 print  
ISSN 2518–1327 online

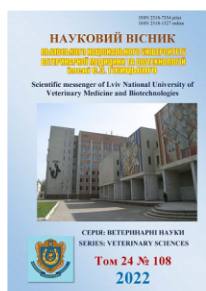
doi: 10.32718/nvlvet108  
<https://nvlvet.com.ua/index.php/journal>

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Series: Veterinary sciences

ISSN 2518–7554 print  
ISSN 2518–1327 online

doi: 10.32718/nvlvet108  
<https://nvlvet.com.ua/index.php/journal>

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Науковий вісник ЛНУВМБ імені С.З. Гжицького. Серія: Ветеринарні науки, 2022, т 24, № 108

**НАУКОВИЙ ВІСНИК**  
**ЛЬВІВСЬКОГО НАЦІОНАЛЬНОГО УНІВЕРСИТЕТУ ВЕТЕРИНАРНОЇ**  
**МЕДИЦИНИ ТА БІОТЕХНОЛОГІЙ**  
**імені С.З. ГЖИЦЬКОГО**  
заснований у 1998 році

**Scientific Messenger**  
**of Lviv National University**  
**of Veterinary Medicine and Biotechnologies**

**СЕРІЯ: ВЕТЕРИНАРНІ НАУКИ**

**SERIES: VETERINARY SCIENCES**

**Том 24 № 108**

Підписано до друку 20.12.2022. Формат 60x84/8  
Гарн. Times New Roman. Папір офсетний № 1. Ум. друк. арк. 24,06  
Наклад 300 прим. Зам. № 20/12.

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Ел. пошта: bkorpan@ukr.net, тел. 093-480-6141  
Код ДРФО 1948318017, Свідоцтво про державну реєстрацію  
В02 № 635667 від 13.09.2007