https://doi.org/10.26898/0370-8799-2021-5-9
УДК: 619.615.015.4;616-084;616.3;636.4
Тип статьи: оригинальная
Type of article: original

МОНИТОРИНГ БОЛЕЗНЕЙ ОРГАНОВ ПИЩЕВАРЕНИЯ КРУПНОГО РОГАТОГО СКОТА НА ТЕРРИТОРИИ ЗАБАЙКАЛЬСКОГО КРАЯ

(✉) **Савельева Л.Н., Бондарчук М.Л.**
Научно-исследовательский институт ветеринарии Восточной Сибири – филиал Сибирского федерального научного центра агробиотехнологий Российской академии наук
Забайкальский край, г. Чита, Россия
(✉) e-mail: luba.saveleva@mail.ru

Представлена динамика болезней органов пищеварения бактериальной этиологии среди крупного рогатого скота. Проанализированы статистические, лабораторные среднегодовые данные о зарегистрированных с этой патологией животных, о падеже и вынужденном убое скота за период 2016–2020 гг. Выяснено, что болезни органов пищеварения бактериальной этиологии распространены как у молодняка КРС (от 53,7 до 61,4%), так и у взрослого скота (43,1% от общего поголовья заболевших животных). На основании бактериальных методов исследований биологического материала выделены следующие возбудители: энтеропатогенная кишечная палочка *E. coli* (37,8% от общего числа заболевших животных) и стрептококки группы «D»-E. Faecalis (15,1%). У остального поголовья зарегистрированы ассоциативные формы инфекций (19,2%) и незаразные виды болезней органов пищеварения (27,9%). В результате проведенного мониторинга отмечен высокий уровень заболеваемости болезней органов пищеварения среди крупного рогатого скота в животноводческих хозяйствах следующих районов Забайкальского края: Акшинский, Красночикойский, Кыринский, Нерчинский, Оловянинский, Приаргунский, Хилокский, Шелопугинский, Агинский. Наименьшее распространение заболеваний крупного рогатого скота в организациях разных форм собственности зарегистрировано в крестьянско-фермерских хозяйствах края (6,8–10,9%). Средние показатели по численности зарегистрированных животных с данной патологией отмечены в сельскохозяйственных организациях (26,9–37,6%). Высокий процент данных заболеваний отмечен в хозяйствах населения (62,8%). При соблюдении в хозяйствах организации лечебно-профилактических мероприятий, правил гигиены содержания и кормления можно обеспечить сохранность и продуктивность скота, высокое качество и безопасность продукции скотоводства, проводить профилактику бактериальных заболеваний органов пищеварения.

Ключевые слова: крупный рогатый скот, мониторинг, болезни органов пищеварения, бактериальные болезни

MONITORING OF THE BOVINE DIGESTIVE DISEASES ON THE TRANSBAIKAL TERRITORY

(✉) **Savelyeva L.N., Bondarchuk M.L.**
Research Institute of Veterinary Medicine of Eastern Siberia – branch of the Siberian Federal Scientific Centre of Agro-BioTechnologies of the Russian Academy of Sciences
Chita, Transbaikal Territory, Russia
(✉) e-mail: luba.saveleva@mail.ru

The dynamics of digestive diseases of bacterial etiology among cattle are presented. Statistical, laboratory and annual average data on registered animals with this pathology, mortality and forced slaughter of livestock were analysed for the period 2016-2020. It has been found that digestive diseases of bacterial etiology are prevalent both in young cattle (53.7% to 61.4%) and in adult cattle (43.1% of the total number of diseased animals). The following pathogens were identified on the basis of bacterial tests on biological material: enteropathogenic *E. coli* (37.8% of the total number of diseased animals) and group D streptococci, E. Faecalis (15.1%). The rest of the herd had associated infections (19.2%) and non-contagious digestive diseases (27.9%). As a result of this monitoring, a high incidence of digestive diseases among cattle in livestock farms in the

following districts of the Trans-Baikal Territory was recorded: Akshinsky, Krasnochikoysky, Kyrinsky, Nerchinsky, Olovyaninsky, Priargunsky, Khiloksky, Shelopuginsky, Aginsky. The lowest prevalence of cattle diseases in organizations of various forms of ownership has been recorded in peasant farms in the region (6.8-10.9%). The average number of registered animals with this pathology is recorded in agricultural organizations (26.9-37.6%). A high percentage of these diseases were recorded in households (62.8%). When farms follow the organization of therapeutic and prophylactic measures, housing and feeding hygiene rules, it is possible to ensure the safety and productivity of livestock, high quality and safety of livestock products and to prevent bacterial diseases of the digestive organs.

Keywords: cattle, monitoring, diseases of the digestive system, bacterial diseases

Для цитирования: *Савельева Л.Н., Бондарчук М.Л.* Мониторинг болезней органов пищеварения крупного рогатого скота на территории Забайкальского края // Сибирский вестник сельскохозяйственной науки. 2021. Т. 51. № 5. С. 77–82. https://doi.org/10.26898/0370-8799-2021-5-9

For citation: Savelyeva L.N., Bondarchuk M.L. Monitoring of the bovine digestive diseases on the Transbaikal territory. *Sibirskii vestnik sel'skokhozyaistvennoi nauki = Siberian Herald of Agricultural Science,* 2021, vol. 5, no. 5, pp. 77–82. https://doi.org/10.26898/0370-8799-2021-5-9

Конфликт интересов
Авторы заявляют об отсутствии конфликта интересов.
Conflict of interest
The authors declare no conflict of interest.

INTRODUCTION

Respiratory and gastrointestinal diseases of young cattle are the most widespread at the present stage of livestock development. The reasons for this are that farms are staffed with "prefabricated livestock" from farms with different epizootic situations and non-compliance with the standard indicators of animal housing and feeding. High morbidity of young cattle leads to forced slaughter and death of a significant number of animals, to a decrease in live weight, which hinders the development of animal husbandry [1, 2].

Mass gastroenteritis in animals, in particular in newborn calves, is considered to be a factor-associated infection, etiologically determined by viruses, bacteria, protozoa and fungi. These diseases are epizootic in nature and are characterized by their stationarity, ubiquitous distribution and the presence of potentially virulent microbial associations [3-5].

Statistical and scientific data allow most gastrointestinal diseases of animals to be regarded as infectious diseases. They are caused by viruses (corona-, rota-, enteroviruses), bacteria (escherichia, clostridia, salmonella, etc.), protozoa, helminths (trichocephalus, strongyloides, etc.). Gastroenteritis of non-infectious etiology can also occur [2, 5].

The specific etiopathogenesis, clinical manifestation and course of the disease are determined by the interaction of macro- and microorganisms, the nature of the associations, the virulence of which is increased in the presence of unfavorable environmental factors [4–6].

The intestinal microflora, being in close relationship with the microorganisms, always reacts to changes in the conditions of housing, feeding and the presence of a pathological process. Any exposure caused by poor hygienic conditions within the production facility, improper transition to a new ration or stress can significantly affect the gastrointestinal ecosystem of calves [6-10]. In this regard, the issue of digestive diseases of bacterial etiology remains relevant.

The purpose of the research is to monitor digestive diseases of bacterial aetiology among cattle in the Trans-Baikal Territory.

MATERIAL AND METHODS

The material was cattle with signs of gastrointestinal diseases (including young cattle) from 10 districts of Trans-Baikal Territory (Aginsky, Akshinsky, Krasnochikoysky, Kyrin-

sky, Nerchinsky, Olovyaninsky, Priargunsky, Khiloksky, Chitinsky and Shelopuginsky). During monitoring, clinical and epizootological, statistical data on registered diseased animals in farms, veterinary reporting data (Form No. 2 - vet)[1] and laboratory tests results were taken into account. To clarify the diagnosis, sampling and examination of biological material (faeces, blood) from adult cattle and calves were carried out. Laboratory tests were conducted in the laboratory of laboratory and analytical studies of the Research Institute of Veterinary Science of Eastern Siberia - a branch of the Siberian Federal Scientific Center of AgroBioTechnologies of the Russian Academy of Sciences and the State Institution of the Regional Veterinary Laboratory. Bacteriological and biochemical tests were carried out in accordance with approved regulatory documentation[2].

RESULTS AND DISCUSSION

As a result of the data analysis of the examined livestock in 10 farms of Transbaikal Territory, digestive diseases take the leading place. In this connection, we took into account the data on registered sick animals, the number of fallen and forcedly killed cattle, including young cattle.

The number of diseased and dead animals from digestive diseases decreased by 21.8% and 66.3% respectively in cattle during the 5-year period compared to 2020 (see the table). In young animals, the morbidity rate was 33.4% and the mortality rate decreased by 66.3% of the total number of diseased animals with this pathology. To clarify the causes and factors of gastrointestinal diseases in cattle, such as colibacillosis, salmonellosis, streptococcosis and others, an analysis of laboratory tests for 2016-2020 was conducted. The figure shows the data on animals with digestive diseases of bacterial aetiology as a percentage of the total number of the diseased cattle in the region (29,599 heads in a 5-year period).

Statistical, laboratory and scientific data (2016-2020) show that digestive diseases of bacterial etiology are registered in young cattle (53.7% to 61.4%) and in adult cattle, with an average of 43.1% of the total number of animals suffering from digestive diseases over five years.

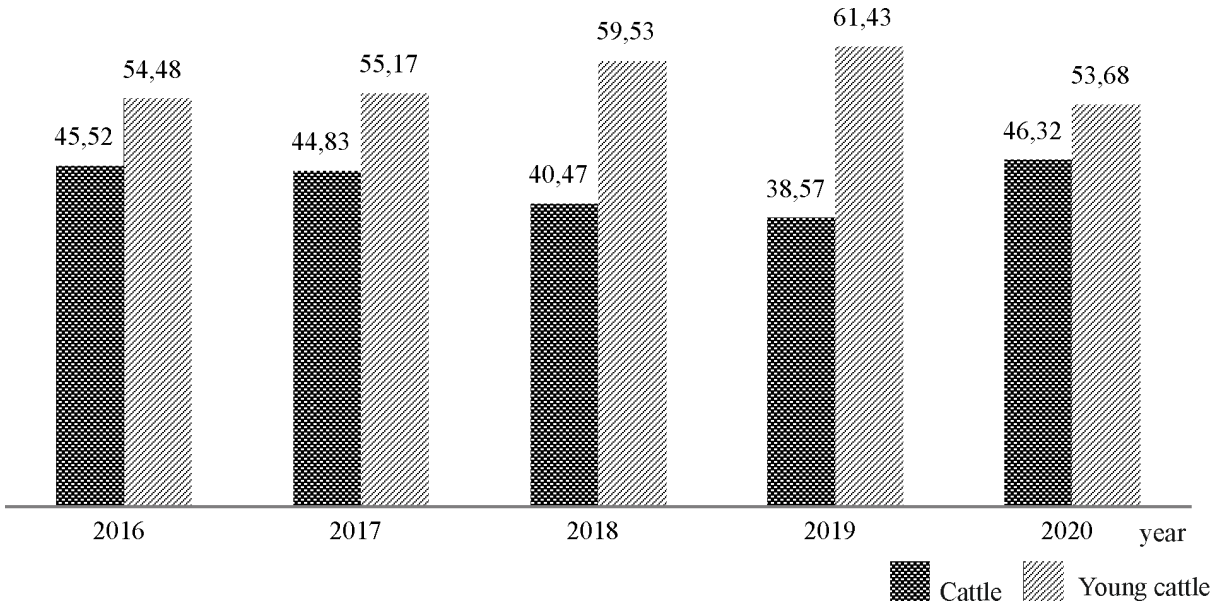
From biological material by bacteriological methods of investigation enteropathogenic *E. coli* was detected in 37.8% of the animals, group "D"-E.Faecalis in 15.1%, the rest of the animals had associated infections (19.2%) and

Данные об исследованных больных животных с болезнями органов пищеварения за 2016–2020 гг.
Data on the studied sick animals with diseases of the digestive system for 2016–2020

Year	Initially registered sick animals, heads		Of the reported sick animals, dead and compulsorily slaughtered, heads			
	bovine cattle	young cattle	bovine cattle		young cattle	
			dead	compulsorily slaughtered	dead	compulsorily slaughtered
2016	4577	2490	300	64	169	6
2017	4209	1887	186	77	102	0
2018	4127	1670	240	35	134	0
2019	3900	1504	178	48	85	5
2020	3578	1657	95	43	39	0

[1]Veterinary Reporting Form No 2 - vet "Information on non-communicable animal diseases" 2016-2020.

[2]MG 4.22723-10 and MG on bacteriological diagnosis of colibacillosis (escherichiosis) of animals, approved by the Department of Veterinary Medicine of the Ministry of Agriculture and Food of the Russian Federation No 13-7-2/2117 27.07.00. M., 2000. 54 p.



Динамика зарегистрированных болезней органов пищеварения бактериальной этиологии среди крупного рогатого скота, 2016–2020 гг.,%

Dynamics of reported digestive diseases of bacterial etiology among cattle from 2016–2020, %

non-infectious forms of digestive system diseases (27.9%).

As a result of this monitoring, a high level of disease incidence was noted among cattle in the following districts of Trans-Baikal Territory: Akshinsky, Krasnochikoysky, Kyrinsky, Nerchinsky, Olovyaninsky, Priargunsky, Khiloksky, Shelopuginsky, Aginsky.

Analysis of clinical and laboratory data shows that the incidence of gastroenteritis in newborn calves varies from single cases to 15-30%, lethality reaches 40-60% of the number of diseased animals, in addition to a decrease in meat productivity of 10-18% in over diseased animals.

In absolute numbers, losses from gastrointestinal diseases in 2016 were 2,465 heads, in 2017 and 2020 - 2008 and 1,826 heads, respectively. In 2020, in relation to 2016, the level of digestive diseases in young cattle increased by 6.5% and amounted to 55.7-62.8% of the total number of the diseased cattle.

The lowest percentage of diseased cattle with digestive diseases is registered in the farms of the region (6.8-10.9%). The average number of registered animals with this pathology is recorded in agricultural organizations (26.9-37.6%); the most frequent occurrence of these diseases is in household farms (62.8%).

CONCLUSION

According to monitoring of digestive diseases among cattle on a number of farms of various forms of ownership in Trans-Baikal Territory, the lowest incidence of the disease was recorded in peasant farms (6.8-10.9%). The average rate of registered animals with this pathology is noted in agricultural organizations (26.9-37.6%). A high percentage of these diseases was recorded in household farms (62.8%).

During bacterial diagnosis of biological material enteropathogenic *E. coli* was detected in 37.8% of cattle, group "D"-E. Faecalis - 15,1%, the rest of cattle (47,1%) have associated forms of infections and non-infectious forms of digestive diseases. Implementation in cattle farms of therapeutic and preventive measures, rules of hygiene of maintenance and feeding provides safety and productivity of livestock, high quality and safety of livestock products, prevention of bacterial diseases of digestive organs of animals.

СПИСОК ЛИТЕРАТУРЫ

1. *Гумеров В.Г.* Диагностика и специфическая профилактика респираторных и желудочно-кишечных инфекций крупного рогатого скота: монография. Казань: Казанская государственная академия ветеринарной медицины им. Н.Э. Баумана, 2016. 278 с.
2. *Желябовская Д.А, Шульга И.С., Остякова М.Е., Силенко В.А.* Распространенность заболеваний органов пищеварения крупного рогатого скота и его молодняка в Амурской области // ФГБНУ Дальневосточный зональный научно-исследовательский ветеринарный институт. 2019. № 49. С. 64–68.
3. *Макаров В.В., Святковский А.В., Кузьмин В.А.* Эпизоотологический метод исследования. СПб.: Лань, 2009. 224 с.
4. *Тамбиев Т.С., Тазаян А.Н., Бывайлов В.П., Кошляк В.В., Малышева Л.А.* Характеристика эпизоотического процесса при смешанных желудочно-кишечных инфекциях бактериальной этиологии в Ростовской области // Ветеринарная патология. 2015. № 3 (53). С. 5–10.
5. *Савельева Л.Н., Бондарчук М.Л., Куделко А.А.* Применение нового фитопрепарата при желудочно-кишечных расстройствах поросят // Сибирский вестник сельскохозяйственной науки. 2020. № 5. С. 56–61. DOI: 10.26898/0370-8799-2020-5-6.
6. *Савельева Л.Н., Бондарчук М.Л, Куделко А.А.* Этиологические факторы острых расстройств желудочно-кишечного тракта у свиней на территории Забайкальского края // Дальневосточный аграрный вестник. 2017. № 3 (43). С. 142–146.
7. Усикова Т.И. Этиология болезней желудочно-кишечного тракта молодняка крупного рогатого скота // Хакасский государственный университет им. Н.Ф. Катанова. 2018. № 1. С. 88–91.
8. *Acres S.D*. Enterotoxigenec Escherichia coli infections in newborn calves // Journal of Dairy Science. 1985. Vol. 68. N 1. P. 229–256.
9. *Baldwin R.L.* Modeling ruminant digestion and metabolism. London, New York: Chapman and Hall, 1995. 578 p.
10. *Foster D.M., Geof W.S.* Pathophysiology of Diarrhea in Calves. Veterinary Clinics of North America // Food Animal Practice. 2009. N 25. P. 13–36.

REFERENCES

1. Gumerov V.G. Diagnosis and specific prevention of respiratory and gastrointestinal infections in cattle: a monograph. *Kazanskaya gosudarstvennaya akademiya veterinarnoi meditsiny im. N.E. Baumana = Kazan State Academy of Veterinary Medicine named after N.E. Bauman*, 2016, 278 p. (In Russian).
2. Zhelyabovskaya D.A, Shul'ga I.S., Ostyakova M.E., Silenko V.A. Prevalence of digestive diseases in cattle and their young in the Amur region. *FGBNU Dal'nevostochnyi zonal'nyi nauchno-issledovatel'skii veterinarnyi institute = Far Eastern Zonal Veterinary Scientific Research Institute*, 2019, no. 49, pp. 64–68. (In Russian).
3. Makarov V.V, Svyatkovskii A.V., Kuz'min V.A. *Epizootological research method*. St. Petersburg, Lan', 2009, 224 p. (In Russian).
4. Tambiev T.S., Tazayan A.N., Byvailov V.P., Koshlyak V.V., Malysheva L.A. Characteristics of the epizootic process in mixed gastrointestinal infections of bacterial etiology in the Rostov region. *Veterinarnaya patologiya = Veterinary pathology*, 2015, no. 3 (53), pp. 5–10. (In Russian).
5. Savel'eva L.N., Bondarchuk M.L., Kudelko A.A. Application of a new phytopreparation for gastrointestinal disorders in piglets. *Sibirskii vestnik sel'skokhozyaistvennoi nauki = Siberian Herald of Agricultural Science*, 2020, no. 5, pp. 56–61. (In Russian). DOI: 10.26898/0370-8799-2020-5-6.
6. Savel'eva L.N., Bondarchuk M.L, Kudelko A.A. Etiological factors of acute gastrointestinal disorders in pigs on the Trans-Baikal Territory. *Dal'nevostochnyi agrarnyi vestnik = Far Eastern Agrarian Herald*, 2017, no. 3 (43), pp. 142–146. (In Russian).
7. Usikova T.I. Англоязычное название статьи. Etiology of gastrointestinal diseases in young cattle. *Khakasskii gosudarstvennyi universitet im. N.F. Katanova = Khakas State University named after N.F. Katanov*, 2018, no. 1, pp. 88–91. (In Russian).
8. Acres S.D. Enterotoxigenic Escherichia coli infections in newborn calves. *Journal of Dairy Science*, 1985, vol. 68, no. 1, pp. 229–256.
9. Baldwin R.L. *Modeling ruminant digestion and metabolism.* London, New York, Chapman and Hall, 1995, 578 p.
10. Foster D.M., Geof W.S. Pathophysiology of Diarrhea in Calves. Veterinary Clinics of North America. *Food Animal Practice*, 2009, no. 25, pp. 13–36.

ИНФОРМАЦИЯ ОБ АВТОРАХ

(✉) **Савельева Л.Н.,** кандидат биологических наук, ведущий научный сотрудник; **адрес для переписки:** Россия, 672010, Забайкальский край, г. Чита, ул. Кирова, 49; e-mail: luba.saveleva@mail.ru

Бондарчук М.Л., младший научный сотрудник

AUTHOR INFORMATION

(✉) **Lubov N. Savelyeva,** Candidate of Science in Biology**,** Lead Researcher; **address:** 49, Kirova St., Chita, 672010, the Trans-Baikal Territory, Russia; e-mail: luba.saveleva@mail.ru

Maria L. Bondarchuk, Junior Researcher

Дата поступления статьи / Received by the editors 22.07.2021
Дата принятия к публикации / Accepted for publication 06.10.2021
Дата публикации / Published 25.11.2021