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Review Article

**ANALYTICAL REVIEW OF CURRENT STATE THE
EPIZOOTIC SITUATION OF CATTLE LEUKEMIA IN THE
RUSSIAN FEDERATION**¹Leonid Fogel, ²Olga Kozyrenko, ³Vladimir Kuzmin, ⁴Eduard Dzhavadov, ⁵Yury Danko
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Abstract:

Cattle leukemia is one of the most serious and complex diseases for the Russian Federation, including from an economic point of view. Among the main infectious diseases of cattle in the Russian Federation, cattle leukemia takes 40-65.8%. The prevalence of the disease is associated with the use of black-and-white as well as red cattle for crossing to increase milk production. It is among these breeds that cattle leukemia occurs most often. It is believed that in our country, the occurrence of leukemia is associated with the importation from Germany of pedigree cattle on the territory of Western Siberia, the Kaliningrad, Moscow, Leningrad regions in 1940, 1945-1947.

At the present stage in the Russian Federation, about a third of the cattle livestock is infected with leukemia. As a result of what was held in 2015. Studies of more than 23 thousand samples of biomaterial and blood from cattle and small ruminants in 183 farms in 43 regions and their analysis found that 33.2% of them contained the genome of the causative agent of leukemia.

The Veterinary Department of the Ministry of Agriculture of Russia states that today in the whole country there is no fundamental improvement in the epizootic situation of cattle leukemia. Numerous works by domestic leukemia experts indicate that leukemia causes significant economic damage not only with the forced culling of sick animals, which, as a rule, are the most highly productive, but also due to the fact that animals infected with leukemia virus: lose their breeding value and not subject to sale; reduced by 12-15% milk and meat productivity.

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SHORT REVIEW:

Cattle leukemia is one of the most serious and complex diseases for the Russian Federation, including from an economic point of view. In addition, at the moment the development of science and practice does not allow creating effective means of treatment and prevention of this disease. Among the main infectious diseases of cattle in the Russian Federation, cattle leukemia is 40-65.8% [1]. This dynamic has been observed in recent decades. Based on the mathematical processing of the epizootological data on identifying unsuccessful items, there is no need to talk about improving the epizootic situation in the next 2 ... 3 years [2].

The main goal of breeders has always been the high productivity of cows, which as a result increased to the detriment of animal immunity. The prevalence of the disease is associated with the use of black-and-white as well as red cattle for crossing to increase milk production. It is among these breeds that cattle leukemia occurs most often. It should be noted that in wild animals, leukemia affects no more than 5% of individuals.

In Russia, cattle leukemia could get along with the importation of highly productive livestock. It is believed that in our country, the occurrence of leukemia is associated with the importation from Germany of pedigree cattle in Western Siberia, the Kaliningrad, Moscow, Leningrad regions in 1940, 1945-1947 [3]. In the future, leukemia in our farms spread everywhere. It was impossible to scientifically confirm this hypothesis in the 40s, since the virus itself was described only in 1969. Officially, leukemia in the USSR gained recognition since 1965. It was then that the official first instruction on how to combat it appeared [4].

At the present stage in the Russian Federation, about a third of the cattle livestock is infected with leukemia. In 2016, leukemia was diagnosed in 68 subjects of the Russian Federation [5]. Leukemia causes the greatest damage to breeding farms, as during anti-epizootic measures, the gene pool of the breeds is destroyed, the breeding and cultivation of valuable pure breeds of highly productive animals are damaged [6, 7]. Since 1997, cattle leukemia in Russia has been ranked first in the structure of infectious pathology [8, 9]. Due to restrictions on leukemia, breeding farms cannot realize genetically valuable gobies and heifers, and they turn into commodity producers of meat and milk. In addition to direct damage and high costs of recreational activities, cattle leukemia adversely affects the general economic indicators of livestock production [10].

Data on the number of animals suffering from leukemia were published by the Federal Center for Animal Health (FGBU "ARRIAH"), taking into account the fact that in 2015 in the Russian Federation about 19 million head of cattle were registered. As a result of what was held in 2015. Studies of more than 23 thousand samples of biomaterial and blood from cattle and small ruminants in 183 farms in 43 regions and their analysis found that 33.2% of them contained the genome of the causative agent of leukemia. Rotavirus infection of cattle (18.5% of samples) of cattle, found in 18.5% of samples, was second among cattle diseases [11]. A number of Russian researchers have found out the main ways of transmission of the pathogen of cattle leukemia from infected to intact animals; proved the presence of leukemia virus in the body of cattle in the electron microscopic study of samples of the liver and spleen, blood plasma and somatic milk cells of cows; studied the properties of the virus: tropism for lymphoid tissue, lifelong persistence, ability to cause secondary immunodeficiency states; improved the main methods of diagnostics, prophylaxis, corrected the ways of health improvement of the farms from cattle leukemia. However, some problems of leukemias in farm animals are still not fully studied, in particular: improvement of the technology for obtaining offspring free from the pathogen of cattle leukemia; isolated rearing of young stock, excluding the possibility of infection; methods for diagnosing intrauterine infection of cattle fruits in leucosis-unfavorable farms; radiological risk assessment of cattle leukemia; relationship with cycles of solar activity [12, 13, 14, 15, 16]. The etiology of leukemia has been studied by scientists in many countries for many decades, and only in 1969 J. Miller et al. discovered the leukemia virus in cattle. It should be noted that a fundamental study of leukemia carried out domestic scientists. Long-term experiments and analysis of literary sources allowed V.P. Shishkov in 1988 put forward a virus-immunogenetic theory of the etiology and pathogenesis of leukemia and a number of other animal tumoral diseases, which has been confirmed to date by numerous studies by domestic and foreign scientists [17].

Epizootic leukemia in cattle is a chronic malignant lymphoproliferative disease of viral etiology, widespread in all countries of the world. The OIE Terrestrial Animal Health Code (2016) and other documents of international organizations use the term enzootic bovine leukosis. The problem of bovine leukemia is the most urgent problem of veterinary medicine [18, 19], which is associated with a large number of livestock breeders who have contact with

infected animals when they are serviced, or specialists from meat-processing industries contacting at slaughter and processing of meat from these animals. And so far there is no consensus on the problem of bovine leukemia. So, some researchers [20] believe that cattle leukemia is a non-contagious infection and, with full observance of veterinary-sanitary and zoohygienic measures, it is possible to keep the infected and intact animals together. However, some problems of leukemias in farm animals are still not fully studied, in particular: improvement of the technology for obtaining offspring free from the pathogen of cattle leukemia; isolated rearing of young stock, excluding the possibility of infection; methods for diagnosing intrauterine infection of cattle fruits in leucosis-unfavorable farms; radiological risk assessment of cattle leukemia; interconnection with solar activity cycles.

CONCLUSION:

Thus, despite the widespread introduction of new methods for laboratory diagnosis of the disease and the adoption in 1999 of the "Rules for the Prevention and Control of Cattle Leukemia" [47]. The Veterinary Department of the Ministry of Agriculture of Russia states that today in the whole country there is no fundamental improvement in the epizootic situation of cattle leukemia. Numerous works of domestic leukemia experts indicate that leukemia causes significant economic damage not only with the forced culling of sick animals, which, as a rule, are the most highly productive, but also due to the fact that animals infected with the leukemia virus: are not subject to sale; reduce milk and meat productivity by 12–15%; lose their nutritional value and dietary properties of milk due to a decrease in total protein, most amino acids and metabolism They are often affected by various diseases (endometritis, mastitis, pneumonia, diarrhea, acute respiratory viral infections, necrobacteriosis); the introduction of tuberculin; the enormous economic losses of farms are associated with numerous annual diagnostic studies carried out in the framework of recovery. All this indicates the need for further study of this pathology in cattle.

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