

Diseases in Calves in Environmentally Unfavourable Conditions of the Chui Region of Kyrgyzstan

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Annotation

The article presents the results of an experimental study on the content of macro- and microelements in the system: - soil - water - feed - blood, and their influence on the occurrence of immune deficiencies in calves.

Keywords: Ecology, morphology, biochemistry, cattle, calves, soil, water, feed, macro- and microelements, blood, immune deficiencies, biogeocenotic pathology

Introduction

In recent years in Kyrgyzstan, the environmental situation has changed noticeably and, in connection with this, new problems have appeared for veterinary science, one of which is a comprehensive study of a certain biogeocenosis and its impact on the occurrence of mass biogeocenotic pathologies in animals, i.e. immune deficiencies, one of the forms of biogeocenotic pathology.

Currently, many scientists in the world and in Kyrgyzstan are working on this problem (A.A. Elenschläger [17] ; M.D. Nogoibaev et al. [3,4]; E.R. Ismagulova[2]; V. V. Valetov et al. [1], A.V. Sindreva[13], etc.). As they claim in their studies, changes in biogeocenoses necessarily affect the condition of animals, and this is the cause of the emergence of mass biogeocenotic pathologies.

Materials and Research Methods

A scientific and experimental study was carried out at the "Vetka" Agricultural Cooperative, Chabrets agricultural enterprise and the Sokuluk State Breeding Plant processing plant in the region, the content of macro- and microelements in soil, water, plants (feed) and blood in animals was studied using atomic absorption spectrophotometry . Analyzes of the morphological and immune composition of blood in pregnant cows and their calves were carried out in the department of technology of feed production and animal feeding of Kyrgyzstan. NIIZhIP and at the Department of Internal Animal Diseases of KNAU named after. K.I. Scriabin [10, 12].

Results

Soil, water feed as a component of a certain biogeocenosis is of great importance, especially when studying biogeocenotic pathology in cattle. It has been established that the main cause is biogeocenotic pathology in cattle is an imbalance in soil, water, feed (plants) of individual macro- and microelements. In this regard, we set the task of studying soil, water, and feed for the content of macro- and microelements in them [4, 5, 6].

After experimental studies, it was established that the amount of many macro- and microelements in the soil of an ecologically unfavorable biogeocenosis changes significantly compared to the basic indicators; for example, the content of manganese, phosphorus, magnesium, on the contrary, is greater than the threshold concentration [8, 9].

If we take the water data, we can conclude that the content of some elements, such as calcium, magnesium, phosphorus, iron, copper, manganese, selenium, molybdenum, cobalt, iodine, is reduced, and another, like zinc, is slightly increased to 0.007 mg/l versus 0.005 mg/l I, and the content of macro- and microelements in the feed indicates that certain indicators, for example, the amount of calcium has increased by 24.2%, and magnesium by 39.3% compared to the norm. Other biogenic elements such as phosphorus, copper, manganese, selenium, cobalt and iodine in the feed (plants) of this biogeocenosis were significantly lower than the control samples. This difference in the content of macro- and microelements in soil, water and plants (feed) in turn affects the morphoimmunological status of the blood of cows and their calves [8, 9, 10].

The results of a comparative study of the morphoimmunological composition of blood in cows and their calves with the control group are shown in the table.

Table 1. Comparative indicators of the immunomorphological composition of blood in cows and their calves

No.	Indicators	Experienced group		Control group	
		Cow	Calves	Cow	Calves
1.	Red blood cells, in $10^{12}/l$	5.85	7.36	6.5	8.6
2.	Leukocytes, $10^9/l$	8.9	9.2	10.0	9.6
3.	Hemoglobin, g/l	112.2	103.6	113.0	112.0
4.	Basophils, %	2.1	0.4	0.1	-
5.	Eosinophils, %	12.4	1.2	6.0	-
6.	Myelocytes, %	-	-	-	-
7.	Young, %	-	0.9	0.1	0.2
8.	Segmented, %	33.0	22.3	27	25.3
9.	Rods, %	2.3	6.2	2.8	2.0
10.	Lymphocytes, %	48.6	43.4	59	56.4
11.	Monocytes, %	2.0	3.2	5.0	3.4

Analyzing the data in the table, it should be noted that some indicators of the immunomorphological composition of blood in cows changed sharply compared to the control group, for example, the number of erythrocytes decreased to 5.85 in $10^{12}/l$ versus 6.5 in $10^{12}/l$ i.e. 10.7% below the average physiological norm. Analysis of the pattern of white blood cells showed a decrease in their number in the blood of cows in the experimental group than in the control group by 21.3%. We also proved that the amount of hemoglobin in the blood of animals in the experimental group was reduced by 12.0% compared to the control group [11, 12].

By comparing the leukocyte formula of experimental animals, we found out some changes. Thus, in the blood of cows in the experimental group, an increased content of basophils was found to be 2.1% versus 0.1% in the control values. There was also an increase in the number of eosinophils to 12.4 % i.e. 2.4 times more than healthy animals [11].

An increased number of neutrophils, in particular segmentonuclear forms in cows 33.0% and band forms in calves up to 6.2%, can be considered as a protective adaptation to changes in the biogeocenotic environment of a given biogeocenosis. A reduced number of lymphocytes up to 10.7%, and monocytes up to 60% in the blood of cows and their calves, indicates that the animals in the experimental group have a weak immune reactivity of the body [12].

The Discussion of the Results

As the results of experimental studies show, in the soil, water and feed of this biogeocenosis there is a serious imbalance in the content of individual macro- and microelements, as a result of which various biogeocenotic pathologies arise in animals (N.A. Uraziev et al. [15]; A.A. Elenschläger [17], I.A. Shkuratova [16], A.R. Tairova [14], M.D. Nogoibaev et al. [7, 10, 12], etc.).

Conclusions

- It has been experimentally established that an imbalance in the content of individual macro- and microelements in soil, water and feed always negatively affects the body not only in mother cows, but also in their calves.
- Based on the conducted morphoimmunological studies, it has been established that mother cows and their calves exposed to environmentally unfavorable conditions develop profound metabolic disorders, and massive biogeocenotic pathologies arise, such as immune deficiencies in calves.

Summary

This scientific article presents scientific results on the occurrence of immunodeficiency in young calves due to the effect of the reduction of macro- and microelements in soil, water, feed and blood on the body of a pregnant cow.

References

1. Valetova VV. Trace element composition of soil, water and the metabolic state of cattle in the KSUP Lomovichi of the Oktyabrsky district. 2011; Proceedings of the Moscow State Pedagogical University. 43-48.
2. Ismagulova ER. Clinical and morphological manifestations, prediction and correction of mineral metabolism in animals: 2006.
3. Nogoibaev MD, Mederbekova MS. Prospects for studying biogeocenotic pathology in animals in Kyrgyzstan. 2007; 71-76.
4. Nogoibaev MD. Bioecological assessment of the feed factor in the study of biogeocenotic pathology in animals. 2011; 1(19): 50-53.
5. Nogoibaev MD. Soil as a component of biogeocenosis and its influence on the occurrence of biogeocenotic pathology in animals. *Mater intl Conf Bishkek*. 2011; 86-89.
6. Nogoibaev MD. Biogeocenotic diagnostics of animals in Kyrgyzstan. *Mater m int Congress of Biologists*. 2012; 103-104.
7. Nogoibaev MD. Environmental monitoring and its role in improving the quality of livestock products in mountain biogeocenosis. *Mater m int Conf*. 2012; 5(27): 95-103.
8. Nogoibaev MD. The influence of anthropogenic environmental pollution

- on the occurrence of biogeocenotic pathology of animals. Mater m int. 2013; 254-255.
9. Nogoibaev MD. Food chains and biotic circulation in biogeocenoses. Mater m int symposium. 2013; 254-255.
10. Nogoibaev MD. Biogeochemical aspects of diagnosing animal diseases along the food chain: - soil - water - feed - animals. 2016; 1(37): 185-190.
11. Nogoibaev MD. Morphobiochemical changes in blood in cattle under conditions of environmental distress. 2016; 4 (36): 118-122.
12. Nogoibaev MD. Changes in morphological and immunological status Vestnik KNAU im. K.I. Scriabin. – Bishkek, blood in biogeocenotic pathology in calves. Bulletin of KNAU named after. K.I. Scriabin. 2017; 4 (45): 219 – 223.
13. Sindreva AV. Criteria and parameters of the action of microelements in the system: - soil - plants – animals. 2012.
14. Tairova AR. Biogeocenotic assessment of the “soil-plants-animals” system in the conditions of the agroecosystem of the southern Urals. Mater m int scientific prak. 2010; 365-368.
15. Urazaev NA. Biogeocenosis and agricultural pathology animals. 1985; 175.
16. Shkuratova IA. Biogeocenotic pathology of cattle in the Middle Urals and methods of its correction: Abstract diss doc in et Sci. 2001; 41.
17. Elensschläger AA. Microelements in biogeocenosis and regional pathology of endemic osteodystrophy of cattle. Abstract diss doc in et Sci. 1998; 34.