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## **Etiopathogenesis and prophylaxis of hypomicroelementoses of cows with calves of the soil - climatic conditions in the regions of Zerafshan valley**

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### **Abstract**

Eshburiev B.M. Etiopathogenesis and prophylaxis of hypomicroelementoses of cows with calves of the soil - climatic conditions in the regions of Zerafshan valley.

The usage of preparation "Microvit" per a head 50 g a day during 60 days with the aim of prophylaxis of microelementose of cows with calves conduces to bettering the clinical - biochemical status and haematological indexes, improves the quality of colostrum. All this positively influence on clinical biochemical status of new-born calves, their resistance and after all, lowers the beginning and development of diarrhea of neonatal etiology.

**Keywords:** endemic diseases, microelements, haemoglobin, premix, copper, cobalt, manganese, zinc

### **1. Introduction**

Ecological disasters in the attached to the Aral Sea zones have led to change of soil - climatic conditions in regions of Zerafshan valley. As a result, the percentage of morbidity with endemic diseases of animals, inhabiting in these zones has increased. The solution of this problem plays a great role in prophylaxis of the diseases, which are met at animals, such as: enzootical osteodistrophia, hypocupros, hypocobaltos, alimentary anemia, and in raising the productivity of live - stock - breeding, improving its quality and hence in the ensuring people's health.

The deficiency of some microelements in animals' organisms leads to bad assimilability of food, lowering of the productivity, worsening of the quality of products and breach of the reproductional function of animals<sup>[6]</sup>.

Notwithstanding the great economic detriment, etiology, mechanism of development, early diagnostics and preventive measures of this pathology of cows with calves have not been deciphered yet, which often leads to birth of weak, not possessing vital capacity and susceptible to diseases calves - hypotrophics<sup>[1,3]</sup>.

The state of health and their productivity in all depend on the processes of metabolism, the intensity of which mainly is regulated by the provision of organism with microelements, vitamins and other products of metabolism<sup>[2]</sup>.

The same type of feeding creates the conditions for springing up the deficiency of one type of elements and relative surplus of others in organism. The unfavorable influence on the composition of microelements in fodder is rendered also by abnormal applying mineral fertilizers in the soil. Overdosing of nitric fertilizers lead to the lowering of copper in plants; the surplus of potash fertilizers lowers the content of magnesium, and phosphate - zinc<sup>[1]</sup>.

Most of endemic diseases of animals proceed in combination, in polymorbid forms, chronically. Very often there are marked the diseases caused by the shortage not only of one microelement, but several of them. However the most bright display of pathology is caused by the deficiency or surplus of one certain element<sup>[2,4]</sup>.

The main role in etiology of hypocuprose of sheep is played by the deficiency of copper in the soil and fodder, and the raise of concentration of anthogonists such as: molybdenum, sulphates, cadmium lead<sup>[5]</sup>.

**1.1 The aim of inquiries:** The study of etiology, early diagnostics and elaboration of methods and means of prophylaxis of neonatal etiology at calves.

## 2. Materials and Methods

The researches were conducted on the farms of Bukhara, Navoi and Samarkand regions. The daily diet of cows with calves were studied on the content of digestible protein, carbon hydrates, carotin, calcium, phosphorus, cellulose and also copper, cobalt and zinc.

At the beginning of tests and every 20 days till the end of tests there was taken the blood of experimental cows and analyzed on the content of erythrocytes, haemoglobin, glucose, common protein and reserved alkali by generally accepted methodics, and also the quantity of some microelements (Cu, Co, Mn, Zn) by method of atom - absorption spectrophotometry. To study the functional state of liver there was studied the common bilirubin in the serum of blood (by method of Iendrashik, Kleggorn and Grof) activity of alanin- (ALaT) and aspartataminotransferase (ACaT) (by Raytman, Frenkel). The obtained results were processed by methods of variational statistics, the criteria of authenticity was revealed on 3 stages of probability according to methodics of B.K. Merkurjev [5].

Taking into account the results of regular researches of cows with calves there was elaborated the recipe of mineral - vitamin premix "Microvit" and the experiments were conducted in comparative aspect in 3 series of experiments. There were 3 groups of cows with calves of red - steppe breed in each series 5-7 heads in each, selected on the principle of analogues.

The cows of the first experimental group were fed with premix of 50 g of bentonit, 100 mg of copper sulphate, 100 mg of iodic potassium, 100 mg of manganese sulphate, 20 mg of cobalt chloride, 150 mg of zinc sulphate, 200 thousand IE vitamin A, 120 thousand IE vitamin D<sub>3</sub>, vitamin E 80 mg, the second group was fed with premix "Microvit" (50 g of bentonit, 200 mg of copper sulphate, 150 mg of iodic potassium, 200 mg of manganese sulphate, 40 mg of cobalt chloride, 250 mg of zinc sulphate, 240 thousand IE vitamin A, 160 thousand IE vitamin D<sub>3</sub>, vitamin E 100 mg). The third group of animals was fed with ration, accepted on a farm. The preparation was given to experimental animals daily during all the period of calving. The newborn calves were also under observation during the first 10 days. The mass of their body was determined at birth and 10 days of their life.

## 3. Results

The biochemical situation in Zerafshan valley, particularly under conditions of farms of Bukhara, Navoi and Samarkand is characterized by salting the soils, the content of some microelements such as: copper, cobalt, manganese, zinc was less than average normative indexes.

There was revealed the deficiency of carbon hydrates, carotene, phosphorus, copper, cobalt, manganese, zinc and the surplus of digestible protein, calcium and cellulose in the ration of cows with calves.

The provision of rations with sugar - 46,4%, with phosphorus - 84,2, with copper - 57,0, with cobalt - 75,3%, with manganese - 66,0% and zinc - 61,1%.

The researches have shown that at hypomicroelementoses of polymorbid character the content of haemoglobin, glucose, common protein, reserve alkali, macro- and microelements diminish and the functional state of liver is getting worse by haepatotoxic action of forming toxins.

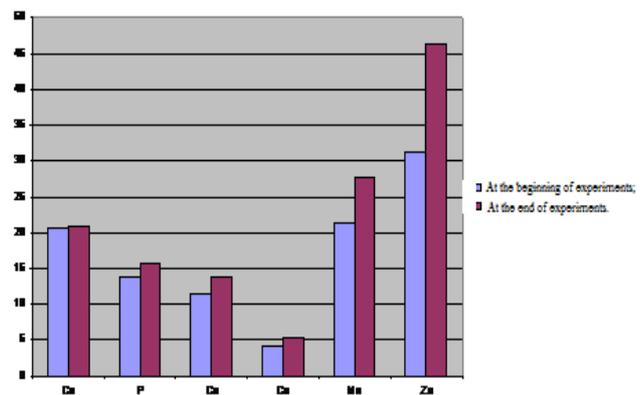
The researches have shown that applied preparations

especially in the composition of "Microvit" 50 g a day per a head during 60 days lead to normalization of all kinds of metabolism at cows with calves, the indexes of content of erythrocytes, haemoglobin, glucose, common protein and reserve alkali, calcium, phosphorus, copper, cobalt, manganese and zinc.

So, at the end of experiments in blood of animals of the first and the second experimental groups it was revealed the increase of the quantity of erythrocytes accordingly to 21,5 - 13,7%, haemoglobin - 14,1-22,5% glucose - 35,4-48,5 %, common protein - 4,8-8,7%, reserve alkali - 8,0-5,9%, calcium - 12,7-9,9%, phosphorus - 8,3-7,18%, copper - 47,3-35,6%, the lowering of the concentration of bilirubin to - 13,5-9,7%, the activity of aspartat- and alaninaminotransferas to 16,7-12,1 and 18,2-14,7% in comparison with initial indexes. The normalization of haematological indexes in physiological limits in this group shows the favorable influence of the used preparations on metabolic processes and bettering protein, synthetic carbon hydrate, detoxical and other functions of liver.

On the contrary, at controlled animals, there was revealed the reduction of the quantity of erythrocytes to 12,3%, haemoglobin - 3,6%, glucose - 10,9%, common protein - 3,4%, reserve alkali - 3,7%, calcium - 8,7%, phosphorus - 7,0%, copper -3,9%, cobalt - 6,9%, manganese - 18,9%, zinc - 18,9% and the raise of concentration of bilirubin to 9,13%, the activity of aspartat- and alaninaminotransferas to 12,1 and 13,7% in comparison with initial ones.

The newborn calves obtained from cows of experimental group had higher level of physiological maturing and resistance. The mass of their bodies was higher to 9,2 - 11,0% in comparison with calves obtained from cows of control group. The morbidity of new-born calves with diarrhea in experimental groups lowered. In addition, the disease, as a rule, was characterized by slight current and ended with recovery. Three new-born calves in control group fell ill with diarrhea (30%) one of them with fatal outcome.



The diagram: The changes in mineral composition of blood at tested animals.

## 4. Conclusion

The usage of preparation "Microvit", in the composition of: bentonit 50 g, potassium iodide - 150 mg, copper sulphate - 200 mg, cobalt chloride - 40 mg, manganese sulphate - 200 mg, zinc sulphate - 250 mg, vitamin A - 240 thousand IE, D<sub>3</sub> -160 thousand IE and vitamin E - 100 mg per a head 50 g a day during 60 days with the aim of prophylaxis of microelementose of cows with calves conduces to bettering the clinical - biochemical status and haematological indexes,

improves the quality of colostrum. All this positively influence on clinical biochemical status of new-born calves, their resistance and after all lowers the beginning and development of diarrhea of neonatal etiology.

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