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DETERMINING THE MECHANISMS OF DEVELOPMENT OF MINERAL METABOLISM DISORDERS IN CALVES

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Abstract:
This article describes the mechanism of development of diseases of mineral metabolism disorders in calves, clinical signs, and dynamics of changes in hematological parameters depending on age.

Keywords: calves, vitamins, minerals, calcium, phosphorus, parathormone, hemoglobin, glucose, carotene.

Аннотация:
В статье описан механизм развития нарушений минерального обмена у телят, клинические симптомы и динамика изменений гематологических показателей в зависимости от возраста.

Ключевые слова: телята, витамины, минералы, кальций, фосфор, паратгормон, гемоглобин, глюкоза, каротин.

Relevance of the topic. Better satisfaction of the demand of the population of our republic for milk, meat, eggs and other food products largely depends on the development of livestock farming and its efficiency. The production of livestock products is mainly carried out by farms and the private sector. Regularly providing the population of the republic with high-quality livestock products is an urgent task of veterinary science and practice.

As in all sectors of the national economy, the specialization of livestock farms, the organization of farms specializing in livestock farming require constant veterinary control of agricultural animals, timely detection of diseases in young animals, and the implementation of veterinary and zootechnical measures that ensure high productivity through effective treatment and prevention.

The causes of mineral metabolism disorders in calves born from productive cows imported to farms of our republic, where livestock farming is developing on the basis of intensive technologies, and the development of effective and easy-to-use local means for early diagnosis, treatment and prevention are urgent issues.

Vitamins and minerals play a significant role in the growth and development of young animals. Therefore, it is necessary to regularly monitor the amount of vitamins and minerals necessary for the body. It has been found that the deficiency or complete absence of certain vitamins and minerals in the diet of animals leads to significant disruption of vital processes in the body and the emergence of diseases with a long latent period in the body. During such diseases, metabolic processes in the body are disrupted to a certain extent, the body stops growing and developing [1,6,8].

Even the smallest amounts of biologically active substances such as enzymes, hormones, vitamins, growth stimulants, arginine, etc. in the body are chemicals with high physiological activity for the animal body and are of great importance in ensuring the normal functioning of tissues and organs [3,5].

When the amount of Ca2+ ions in the blood of animals decreases, vitamin D accelerates its transfer from the bones to the blood. The intensity of calcium

absorption in the intestine and the amount of calcium-binding protein in it decrease from the duodenum to the ileum. Calcium-binding protein bound to vitamin D is present not only in the intestinal mucosa, but also in bone tissue, the pancreas and other organs. Vitamin D also stimulates the absorption of inorganic phosphorus in the duodenum of animals. In the case of calcium and phosphorus deficiency, vitamin D plays a redistributive role by mobilizing calcium and phosphorus from bone tissue and delivering them to bone growth. Vitamin D is abundant in high-quality hay, alfalfa hay, corn silage, fish oil, fish meal, egg yolk, milk, and other products [2,4,7].

Object and methods of research. In order to study the mechanism of development of mineral metabolism disorders in calves, clinical and laboratory examinations were conducted on 1-month-old Simmental calves belonging to the Khikmatov Bunyod farm in Tashkent region. The growth and development indicators of 10 calves separated on the principle of similar pairs up to 3 months of age were studied.
Laboratory examinations were conducted in the private veterinary laboratory "Bioqon" located in Tashkent.
The calves in the experiment were clinically examined for appetite, color of mucous membranes, body coat, mobility, condition of teeth and bones, joints, shape of the chest, heart rate and respiratory rate per 1 minute, and body temperature °C.
Considering that the initial period of metabolic disorders in calves is associated with the quality of cow's milk and its timely provision to calves, the acidity (according to Turner), fat content (Gerber method), protein content (Keldal method), milk sugar (Bertrand method), and dry matter content of cow's milk obtained from cows were determined.

Analysis of the results obtained. The chemical composition and biological properties of colostrum from cows were studied. Colostrum is a specific secretion of the mammary gland, which can be secreted by all mammals (including humans). It begins to be produced by the organism individually in each case - from the 6th month of pregnancy and up to the 10th day after birth. In order to study the chemical composition and biological properties of colostrum milked from experimental cows, colostrum milked on the 1st and 3rd days after calving was analyzed for its chemical

composition. The acidity level of colostrum milked from newly calved cows according to Turner on the 1st day after calving was on average 26.6±1.6 (norm - 39.90), on the 3rd day - 33.1±2.3 T. The fat content of cow's milk on the 1st day after calving was 2.7±0.05% on average, and on the 3rd day - 3.2±0.05% (Table 1). The protein content of cow's milk from cows was also significantly lower than the norm, and on the 1st day after calving - 11.5±0.14% (norm - 14.8%), on the 3rd day - 6.2±0.08%. The protein content of cow's milk below the norm may negatively affect the formation of immunity to diseases in newborn calves [9].

The sugar content of cow's milk on the 1st day after calving was 3.2±0.07% (norm - 3.6%), on the 3rd day - 3.4±0.08%, the dry matter content on the 1st day - 18.5±1.26% (norm - 21.5%), on the 3rd day - 11.2±0.27%. From these indicators it can be seen that the biological value of cow's milk obtained from cows with micronutrient deficiencies is also low.

The literature contains information about the occurrence of dyspepsia in newborn calves in the first days of life who received cow's milk with low acidity, containing fat, proteins, milk sugar and dry matter below the norm [10]. Such sick calves begin to develop metabolic disorders.

1.- table

Milk parameters of experimental cows

INDICATORS	Days after giving birth			
	1- day	3- day	5- day	7- day
Acidity, ^{0}T	26,6±1,6	33,1±2,3	19,3±0,70	17,2±2,6
Fat, %	2,7±0,05	3,2±0,05	3,3±0,04	3,4±0,06
Protein, %	11,5±0,14	6,2±0,08	4,4±0,05	3,2±0,05
Milk sugar,%	3,2±0,07	3,4±0,08	3,7±0,05	3,6±0,06
Dry matter,%	18,5±1,26	11,2±0,27	10,6±0,31	10,2±1,13

Calves were subjected to clinical and hematological examinations starting from the age of one month.

Clinical examinations revealed that at the age of one month, calves showed signs such as pale mucous membranes, increased body cover, change in appetite, poor tooth development, bone deformation, and enlarged joints. These clinical signs were

observed to be clearly manifested from the month of weaning. It was determined that 4 out of 10 calves examined showed signs of gastroenteritis and bronchopneumonia. During the 1-month period, the average respiratory rate per minute was 25.2±0.34 times, the pulse rate was 96.4±1.2 times, and up to 5 months, the dynamics of changes were 28.2±0.24 and 99.8±1.6 times, respectively.

2- table

Clinical indicators of calves M±m. n=10

№	Inspection time	Body temperature, ^{0}S	Number of breaths, per minute	Heart rate, per minute
1	**1 monthly**	39,5±0,05	25,2±0,34	96,4±1,2
2	**2 monthly**	38,9±0,06	24,4±0,33	88,9±2,2
3	**3 monthly**	39,0±0,06	23,8±0,31	93,5±1,8
4	**4 monthly**	39,3±0,04	22,5±0,28	98,4±1,5
5	**5 monthly**	38,9±0,06	28,2±0,24	99,8±1,6

Figure 1. Process of clinical examinations in calves

Hematological indicators in calves were 105.8±2.13 g/l on average at one month of age, 87.9±2.34 g/l at two months of age, 79.6±3.32 g/l, 69.0±3.67 g/l, 68.3±3.35 g/l at three months of age. The number of erythrocytes correspondingly averaged 7.26±0.18 million/µl, 5.96±0.14 million/µl, 5.39±0.20 million/µl, 5.27±0.10 million/µl, 5.05±0.18 million/µl.

It was found that the number of leukocytes in the blood of calves decreased by an average of 1.69 thousand/µl compared to the initial indicators, carotene decreased accordingly to 0.210±0.01 mg%, and glucose decreased to 2.54±0.04 mmol/l. (Table 3)

3- table **Calf blood parameters M±m, n =10.**

Age of calves, months	Hemoglobin, g/l	Erythrocytes, million/µl	Leukocytes, thousand/µl	Carotene, mg%	Glucose, mmol/l
1	105,8±2,13	7,26±0,18	8,06±0,36	0,238±0,02	3,46±0,06
2	87,9±2,34	5,96±0,14	6,96±0,50	0,238±0,02	2,96±0,08
3	79,6±3,32	5,39±0,20	6,85±0,62	0,231±0,01	2,85±0,04
4	69,0±3,67	5,27±0,10	6,55±0,48	0,222±0,03	2,69±0,02
5	68,3±3,35	5,05±0,18	6,37±0,44	0,210±0,01	2,54±0,04

Conclusion

The development of mineral metabolism disorders in calves from the day of their birth is associated with the composition of cow's milk, which is observed in the deficiency of protein, sugar, and fat in it. After the weaning period at 3 months, this pathology is accompanied by symptoms such as anemia, increased body cover, growth retardation, bone deformation, enlarged joints, as well as hypohemoglobinemia and hypoglycemia.

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