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Therapeutic And Prophylactic Use Of A Complex Of Biologically Active Substances And Probiotics In The Gastrointestinal Diseases Of Newborn Calves.

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ABSTRACT

The aim of the research was to study the therapeutic and prophylactic effectiveness of the complex of biologically active substances and probiotics in gastrointestinal diseases of newborn calves. Clinical, morphological, hematological, biochemical, immunological studies of calves and cows were conducted, the relationship between these indicators in them was established. Metabolic disorders in cows of mothers leads to the birth of a weak non-viable young, which is ill with gastrointestinal diseases, in particular dyspepsia, both in mild and severe form. Violations of the ratio of microflora in the stomach and intestines of calves leads to the development of gastroenteritis in calves. The results from the application of the complex of biologically active substances Universal-Forte for dyspepsia, which is high as a preventive and therapeutic effect of probiotics based on *Enterococcus durans* In PMBC-11960 and *Enterococcus faecalis* In PMBC-11830, isolated from the gastrointestinal tract of the European ROE deer and brown bear in the gastro-intestinal diseases (gastroenteritis) in calves, the scheme of treatment of calves of patients with gastroenteritis these probiotics. The study identified etiological factors causing the incidence of dyspepsia in newborns, and gastroenteritis in calves older (10-20 day) age. Obtaining a high therapeutic effect in the dyspepsia of newborn calves was the result of the use of a complex of drugs that had an impact on the correction of metabolism, antioxidant action, immunomodulatory effect, activation of metabolism led to an increase in weight gain in young animals and reduce morbidity. Effective was the use of the drug for prophylactic intramuscular administration to cows mothers for 60,45,30,15 days before the expected delivery, on the day of birth and newborn on the day of birth on 12 and 30 days after birth in appropriate doses, which allows to recommend both for therapeutic and preventive purposes. High therapeutic effect was also obtained from probiotics isolated from the gastrointestinal tract of wild animals.

Keywords: cows, calves, gastroenteritis, dyspepsia, biologically active substances, probiotic, treatment, prevention.

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INTRODUCTION

Obtaining and preservation of young animals is the most important factor in the decision of the food program, providing the population with food. [4,5,6,7] However, the high incidence and incidence of acute digestive disorders (ARI), dyspepsia and gastroenteritis during the neonatal and lactic periods, cause enormous economic damage. This pattern is observed everywhere, according to various data, the incidence reaches 50,70,80 and more percent of the nascent calves [1,2,3]. The causes of morbidity are diverse in different conditions. these are factors affecting the development of the fetus through the mother's body associated with errors in feeding and exploitation of mothers ' cows on the one hand and negative factors affecting the newborn body from the moment of birth and in the following days of the newborn. Often, a mild form of dyspepsia passes into a toxic form and subsequently into gastroenteritis [8.9].

This was the basis for the recommendation and a significant number of methods and means of treatment and prevention, taking into account the etiology and pathogenesis of the disease [10,11,12]. Effective methods and tools in some conditions are not effective in others. At the same time, all etiological factors can be combined into two groups: those that have a negative impact on the development of the fetus through the mother's body and those that negatively affect the newborn animal. Therefore, therapeutic and preventive measures in our opinion should be directed on the one hand to the mother's body, especially in the third trimester, on the other hand to the newborn body. There is a need to find universal methods and means for the prevention and treatment of dyspepsia and gastroenteritis in calves, which was the purpose of our research.. In this regard, the task was set to test the complex of biologically active substances Univetselp-Forte for the prevention and treatment of dyspepsia, which has a corrective metabolism, antioxidant, immunomodulatory, increases metabolism and weight gain in young animals, reducing morbidity and other properties. And the use of probiotics based on Enterococcus durans VKPM B-11960 and Enterococcus faecalis strain M-37A №5 under the registration number VKPM B-11830, isolated from the gastrointestinal tract of European ROE deer and brown bear in gastrointestinal diseases(gastroenteritis) in calves, which have high antibiotic activity including pathogenic microorganisms. Along with antagonism to pathogenic and conditionally pathogenic microorganisms, probiotics possess immunomodulatory, antiallergic, antitoxic and other properties. The use of such tools is fully consistent with the principles of therapy and prevention.

MATERIALS AND METHODS

The object of research was cows and calves of the newborn and dairy age up to 7-8 days and 15-20 days, respectively. For the treatment of gastroenteritis, probiotics developed at the Department of therapy and pharmacology and in the research laboratory of biotechnology of Gorsky GAU at doses of 200.0 ml per head 2 times a day at a concentration of 10¹² million/ml in the treatment complex in comparison with the control and another group, where the treatment complex was included in the control of panzinorm, in another group of oak bark. Therapeutic prophylactic was used Univetsal-Forte (selenium generic veterinary drug) in comparison with antiviral. Universal-Forte been applied at the rate of 10 ml intramuscularly to the cows 3, 60,45,30,15 of day and the day of calving, and calves at 1, 15,30,45 and 60 days after birth in doses of 2-3 ml per calf. The complex of biologically active substances was based in 1 ml of solution: sodium Selenite - 1 mg, zinc sulphate 10 mg, Succinic and linoleic acid 10 mg, vitamin E (combinational E) of -7.5 mg, pharmasin 50 (tylosin)-50ЕД. The solution was exposed to ultrasound for 10 minutes. In the course of research conducted clinical trial, biochemical, morphological, hematological, immunological studies according to standard techniques [12] , were defined therapeutic and prophylactic efficacy.

RESULTS AND DISCUSSION

The use of probiotics in the treatment complex compared with the control, where panzinorm was used, and the first experimental group of calves ,where lignin was used in the treatment of gastroenteritis, led to a better therapeutic effect ,observed on day 5 compared with the control and the first group, where recovery occurred on day 10 and 8, respectively. Gastroenteritis was manifested by some increase in body temperature, increased pulse and breathing, low mobility, some calves gnashing teeth, colic, decreased appetite, increased peristalsis of the intestine,frequent defecation, fecal masses of grayish color with an unpleasant putrid smell, with the release of mucus and gases.. After the course of treatment, clinical signs returned to normal. There was a positive dynamics of morphological hematological, biochemical,

immunological parameters in calves in all groups, but in the group using probiotics for treatment they were better by 5-8 percent compared with the control.

Table 1: Clinical, morphological, biochemical parameters of blood in gastroenteritis of calves before and after treatment n=10, M±m

Indicators	normative value	Groups					
		Before treatment			After treatment		
		Control	1	2	Control	1	2
Temperature, °C	39,1±0,05	40,0±0,15	39,0±0,15	40,0±0,15	39,5±0,03	39,0±0,15	39,2±0,03
Heart rate, beats/min	94,0± 2,0	106,0±0,8	98,0±0,3	100,0±0,6	95,0±1,8	94,0±2,0	93,0±3,0
Breath, dv/min.	23,0± 0,34	25,±0,2	26,0±0,3	27,0±0,4	25,0±0,2	24,0±0,35	23,0±0,34
Erythrocyte, 10 ¹² /l.	6,4-6,8	8,4±0,31	8,2±0,11	8,7±0,1	7,4±0,1	7,8±0,14	6,8±0,4
Leukocytes, 10 ⁹ /l.	9,3 - 12,6	13,1±0,48	12,1±0,31	12,9±0,3	11,5±0,22	12,3±0,3	10,3±0,1
Total protein, г/l	58,0±1,3	62,0±0,7	62,0±1,6	64,0±0,8	60,0±0,2	60,2±0,2	58,0±0,1
Albumins, g / l	30,0±1,3	28,0±0,5	26,0±0,2	23,7±0,3	29,0±0,1	29,0±0,1	30,0±0,01
Alpha-globe., g / l	7,8±1,2	6,2± 0,2	5,9 ±0,07	6,1±0,03	7,1±0,07	6,9±0,9	7,8±0,01
Beta globe., g / l	12,2±2,4	10,7±0,17	10,8±0,28	10,0±0,28	11,2±0,01	12,0±0,001	11,7±0,001
Gamma –glob., g / l	7,9±1,9	6,2±0,28	5,6±0,07	5,3±0,09	7,1±0,07	7,2±0,05	7,7± 0,07
Hemoglobin, g / l	90- 26	130,0±1,8	128,0±3,4	132,0±2,0	110,0±2,0	105,0±1,5	115,0±0,12
ESR	0,5-1,5	0,4±0,01	0,5±0,02	0,5±0,02	1,0±0,05	1,0±0,05	1,5±0,01
Hematocrit, %	36-40	45,0±0,9	48,0±1,2	50,0±1,4	37,0±0,1	36,0±0,1	36,0±0,09
Digesting ability of pepsin, mm	0,5-2,0	0,2±0,03	0,3±0,02	0,3±0,02	1,0±0,01	1,0±0,01	2,0±0,01
Calcium mole / l	2,6 -2,7	2,2±0,05	2,3±0,04	2,1±0,02	2,4±0,02	2,6±0,01	2,7±0,01
Phosphorus, mmol/ l	1,4- 2,2	1,2±0,11	1,3±0,2	1,2±0,06	1,3±0,01	1,4±0,01	1,7±0,03

Dyspepsia was observed in 80% of calves and was characterized by severe digestive disorders, oppression, frequent defecation, often adynamia, lack of appetite, signs of dehydration of various degrees, etc. Infectious diseases were excluded Before carrying out therapeutic and preventive measures, blood from

mothers' cows and calves was examined, to assess the level of metabolism, the incidence and overall physiological resistance of calves by intradermal test with histamine by Ioffe was determined.

30 samples from cows during the period of dryness and 30 blood samples of newborn calves were taken. The incidence in the economy was 80% with a mortality of 18%.

Table 2: results of hematological blood tests of cows and calves M±m(n=30)

Indicators	Ed. izm.	Cows	calves
Erythrocytes	10 ¹² /l	6,9±0,9	6,7±0,9
Leukocytes	10 ⁹ /l	10,8±1,6	13,2±1,2
Hemoglobin	g/l	69,8±5,4	86,0±4,7

Table 3: Leukogram of patients with dyspepsia. M±m(n=10)

Researchtime	B	E	Neutrophils				L	Monocyte
			M	U	P	S		
Beforetreatment	0	2,5	0	17,5	27	32	19	2
Aftertreatment	0	2,0	0	9	20	35	32	3

As the table shows, after treatment, the indicators of leukogram has changed in the direction of normalization. If before treatment there was some shift of neutrophils to the left, then after treatment the number (%) of young forms decreased by half, the number of lymphocytes and monocytes increased. All this indicates a change towards normalization.

Table 4: Biochemical parameters of blood of cows of mothers in the dry period and calves born from them M±m (n=30)

№	Indicators	Ed. izm.	Cows	Newborncalves
1	Total protein	g/l	69,7±5,4	52,2±1,8
2	Albumins	%	39,0±3,7	38,6±1,6
3	Alpha-globulins	%	13,6±2,6	14,2±2,2
4	Beta-globulins	%	15,8±3,6	15,9±0,6
5	Gamma - globulins	%	30,2±2,5	26,4±1,9
6	A / G coefficient	K	0,56±0,08	0,68±0,6
7	TotalCa	mmol / l	2,2±0,10	2,1±0,12
8	Inorganic phosphorus	mmol / l	1,40±0,06	1,46±0,11

9	Alkaline reserve	% CO ₂	3,5±4,6	39,3±1,8
10	Sugar	mmol / l	2,4±0,6	3,8±0,7
11	Carotene	mmol / l	0,52±0,08	0,25±0,03
12	Selenium	mkg/kg	0,30±0,02	0,025±0,02
13	Vitamin E	mkmol / l	10,0±1,7	5,30±0,05

As can be seen from the data of the table there are significant deviations from the norm in terms of both cows and calves, which indicates a relationship between hematological and biochemical parameters.

The same relationship was established in determining these animals immunological parameters, and they were depending on the level of metabolism, which also serves in our opinion one of the important factors of morbidity. So the number of leukocytes is higher, the level of phagocytic activity is lower, the lysozyme and bactericidal activity of blood serum is lower. The same thing happened with the calves born of these cows.

All this gave us the basis for the application of biologically active substances Universal-Forte with prophylactic and therapeutic purposes in the gastro - intestinal diseases of newborn calves (dyspepsia).

The therapeutic and prophylactic application of the complex of biologically active substances (proposed Omarov R. S.) and antidiuretic was performed on 10 cows and 10 calves, obtained from them by 5 goals in each group. Hematological and biochemical parameters were studied. The results showed that cows have metabolic disorders, changes in immunological parameters, which affected the performance of calves.

In this regard, we conducted a study of the therapeutic and preventive effectiveness of the complex of biologically active substances that contribute to the correction of metabolism and increase resistance in 5 cows and 5 calves obtained from them.

The complex preparation offered by Omarov R. S. was administered to cows 60, 45,30,15 days before calving and on the day of delivery intramuscularly at the rate of 10 ml per animal, to calves on the first birthday, on 15, 30, 45, 60 days after birth in a dose of 2-3 ml per calf. The results of studies showed that calves with high birth weight were born from cows, hematological, immunological, biochemical parameters were better than other calves, cows gave birth better, there were no birth pathologies. Of the 5 calves received from these cows, 1 calf fell ill with dyspepsia on the 3rd day in a simple form. The use of a single complex at a dose of 3 ml intramuscularly on the 2nd day led to recovery. In addition, these calves, along with their birth weight, had higher weight gain during 3 months of observation. Among them, there was no incidence

In another group of calves with therapeutic and preventive purposes have adopted a comprehensive drug Antidiareiko. The drug powder, which includes Palestin (sulfate) 4000000ME, sulfaguanidine 1 g, filler-based electrolytes, binders, rehydralyte, energy substances to 100 E.

Antiviral, was used at 100 mg/kg of body weight with colostrum twice morning and evening.

Table 5: Indicators of therapeutic and preventive efficacy in dyspepsia

Indicators	1st groupset. BAV	2GroupAntidiareiko
Average weight of calves at birth	27	24,2
Numberofcalves	5	5
Time of disease, day	3	2-3
Number of cases ,%	1/20	3/60
The percentage recovered.	100	100

Duration of disease, days	1	2
Weight of calves at 10 days of age	29,2	26
Average daily weight gain, g	220	180

As shown by the data presented in the table, the application as a complex of biologically active substances, and antiviral contributes to the reduction of morbidity, reduction of the treatment time, increase weight gain. However, more effective was the complex of biologically active substances, including selenium, vitamin E, zinc sulfate, Linoleic acid and succinic, formazin in the form of a solution intramuscularly. content in 1 ml: sodium Selenite-1 mg., zinc sulfate-10 mg., amber and Linoleic acid-10mg.,vitamin E (combinational E) 7500 IU. pharmasin 50(tylosin) do -50000 ED. the water for injection. The drug after preparation was exposed to ultrasound for 10 minutes

This effect is mainly associated with the normalization of metabolic processes in cows, better development of the fetus, increasing their weight at birth and increasing resistance.

Table 6: Results of determination of economic efficiency of treatment and prophylactic measures at dyspepsia

Indicators	Indicator by groups depending on the method of treatment	
	1 gr. BAV	2GR–Antidiareiko
Prevented economic damage, ruble	16672	14788
Econ. efficacy as a result of treatment, ruble	16590,30	14340,40
Econ. Efficiency per 1 ruble cost	203,10	32 y6

Higher was the effect in the group with the therapeutic and prophylactic use of the complex of BAS than with the use of Antidiareiko.

CONCLUSION

- The greatest therapeutic effect in the treatment of gastroenteritis was obtained in the second group, where, together with traditional drugs, a probiotic was used at a dose of 200.0 ml/2 times a day at a concentration of 10 to 12 million/ml., which is associated not only with antibiotic activity relative to conditionally pathogenic and pathogenic activity amounting to 25-27 mm of growth retardation zone. , but also other properties.
- Treatment of calves with probiotic reduces the course of treatment twice as compared to the control.
- Probiotic in combination with other drugs improves clinical, morphological and biochemical parameters of the body of calves.
- The use of a complex of biologically active substances- "Univetselp-Forte" for therapeutic and prophylactic purposes in dyspepsia promotes normalization of metabolism in cows, increases the weight of the fetus at birth, has a positive effect on the biological status of calves, reduces significantly morbidity, increases weight gain during the first months after birth, has a positive effect on the immune status of both cows and calves.
- The use of Univetselp-Forte for calves for therapeutic purposes in mild dyspepsia prevents diarrhea during the day, and in severe form for 2-3 days after a single application , and the use in the next 15,30,45,60 days prevents the incidence of gastrointestinal diseases
- Positive results obtained in the study allow to recommend a universal selenium veterinary drug "Universal-Forte" proposed by Professor Omarov R. W with medical and preventive purpose in dyspepsia of calves.
- Recommend probiotics developed at the Department of therapy and pharmacology and in THE nil of Gorsky GAU for the treatment of gastroenteritis in calves in the postnatal period.

REFERENCES

- [1] Gadzaonov R.H., Pukhaev I. V. Prevention dyspepsia of calves with the use of lactic acid bacteria. Veterinary journal 2011; 57 (2):112-114.

- [2] Gadzaonov R.H., Ibragimov U.Z., Chegodaev F.N., Safronov V.G. the Application of biogenic stimulators "Univetselp" for the correction of metabolism and prevention of dyspepsia calves. Scientific notes of KGAVM them. N.E. Bauman., 2011; 1: 42-4
- [3] Floch M.N. Probiotics and functional foods in gastrointestinal disorders. *Curr. Gastroenterol. Rep.* 2001; 3 (4): 343-350.
- [4] Folwaczny, C. Probiotics for prevention of uncreative colitis recurrence: al-ternativemedicine added to standard treatment. *J. Gastroenterol.* 2000; 38(6): 547-550.
- [5] Schrezenmain, J. Probiotics, Prebiotics, synbiotics approaching a definition. *Am. J. Clin. Nutr.* 2001; 73: 361-364.
- [6] Shanahan, F. Probiotics in inflammatory bowel disease. *Gut.* -2001; 48 (5): 605.
- [7] Achermann M. Herpesviruses. *Methods in Molecular Biology.* 2004; Vol. 256: 199 - 219.
- [8] ailasapathy K. Survival and therapeutic potential of probiotic organisms with reference to *Lactobacillus acidophilus* and *Bifidobacterium spp.* *Immunol. Cell. Biol.* 2000; 78(1): 80 - 88.
- [9] Rolfe R.D. The role of probiotic cultures in the control of gastrointestinal heal. *J. Nutrition.* 2000; 130: 396 - 402.
- [10] Ahmed A.M. Genetic analysis of antimicrobial resistance in *Escherichia coli* isolated from diarrheic neonatal calves. *Veterinary Microbiology.* 2009; Vol. 136, (3-4): 397-402.
- [11] Kvietkute, N. Effect of probiotic Levucell SB on growth rate in calves. *Veterinarijairzootecnika.* Kaunas, 2005; 32(54): 54-56.
- [12] Link, R. Effect of a high dose of probiotic preparation on some blood indices of calves. *Med. weter.* 2007; 63(2): 171-174.