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RESISTANCE, PRODUCTIVITY, AND QUALITY OF VEAL WHEN USING BASULIFOR PROBIOTIC FEED ADDITIVE

Abstract. Against the background of the use of a probiotic feed additive at a rate of 0.3 g/kg and 0.4 g/kg of fodder, in experimental calves, compared with the controlanalogs, there was a significant increase in the average daily weight gain on the 15th day of the experiment by 4.60-4.90%, on the 30th day - by 5.87 - 6.34%, on the 60th day - by 7.48 - 7.81%, in the blood of animals the number of red blood cells increased by 3.69 - 4.54%, leukocytes - by 1.48 - 1.75%, hemoglobin - by 6.39 - 7.59%, in blood serum the level of total protein - by 3.28 - 3.31% ($P<0.05$), albumin - by 2.08 - 2.69% ($P<0.05$), globulins - by 3.70 - 4.20% ($P<0.05$), gamma globulins - by 12.41 - 12.91 % ($P<0.01$). Introduction to the diet of calves of the specified probiotic feed additive promoted a slight increase of immunoglobulins A in blood serum in the experimental calves, in relation to the control analogues, in both experimental groups of animals by 5.00% ($P<0.05$), immunoglobulins M - by 4.43 - 5.64% ($P<0.01$), immunoglobulins G - by 5.69 - 5.90% ($P<0.05$), increasing the preservation of calves - by 3.22 - 3.69% ($P<0.05$).

Key words: calves, viability, productivity, probiotics, Basulifor feed additive, resistance, preservation.

Introduction. In the conditions of livestock industry, with an increase in the density of animals, the cubic space of premises and, consequently, the air volume per animal decreased sharply. With the accumulation in the livestock premises of excess heat, moisture, harmful gases, reducing the oxygen content and the overall deterioration of the microclimate, there is a weakening of the overall body resistance, productivity, and preservation of young animals. In this regard, it is difficult to achieve an improvement in the resistance and productivity of animals without the use of biologically active probiotic preparations and feed additives. [1,2,3,4].

Currently, an acute problem is the search, testing and use of inexpensive, simultaneously effective drugs and feed additives. To improve the digestibility and availability of fodder with low nutritional value, enzyme preparations are used that contain a complex of amylolytic, pectolytic, cellulolytic and proteolytic enzymes [5,6,7,8]. The use of such drugs is also important in the enzymatic dysfunction of the gastrointestinal tract as replacement therapy. The set of enzymes that make up such preparations depends on the type and age of an animal, as well as on the type of feed used in the diet. [9, 10].

For young cattle, it is more advantageous to use such fermentative preparations, which can be used both in the form of feed additives, and to ferment part of the feed outside the body. The use of exogenous enzymes, in particular, enzymes synthesized by various beneficial spore-forming bacteria, allows to break down the high-molecular components of the feed - proteins, fats, carbohydrates into low-molecular ones. In the animal body, the prepared fodder is more fully broken down by its own enzymes, contributing to its better digestibility and accessibility. Breakdown by enzymes of non-starchy polysaccharides contained in large quantities in grain feeds reduces feed viscosity and ultimately leads to the normalization of microflora in the gastrointestinal tract, which is crucial for calves [11,12,13,14].

In the light of the above-mentioned, one of the factors for increasing the viability, resistance, safety and productivity of young cattle is use of biologically active probiotic preparations and probiotic feed additives in the feeding animals. A special place among this group of drugs is given to the Basulifor, newly created probiotic feed additive, which due to its composition has high bioavailability in the body. In the available literature, we have not found work devoted to the study of the effect of this probiotic feed additive on the body of calves.[15,16,17].

The aim of the research – determination of zootechnic and veterinary practicability of using Basulifor probiotic feed additive when growing calves.

Materials and methods. Scientific and economic test was carried out in the dairy complex of Akkond-Agro JSC of Yantikovsky district, the Chuvash Republic, in Chuvash Republican Veterinary Laboratory of the State Veterinary Service of the Chuvash Republic and in the biochemical laboratory of the Department of Morphology, Obstetrics And Therapy of the Chuvash State Agricultural Academy, in winter and spring periods 2018.

The studies were conducted using 45 healthy, well-developed, of average fatness, 1-week-old, with a live weight of 32-34 kg, calves of the Black-and-white breed. Based on the principle of groups-analogs animals were divided into 3 groups (control and two experimental) of 15 animals each. The calves were kept in separate sections, the feeding and housing conditions were the same for all groups. Calves were accustomed to eating hay and combined feed starting from 10-12 days of age. In contrast to the control group, calves of the first experimental group within 30 days with milk, and within 31-90 days with feed were additionally given dry Basulifor at the rate of 0.3 g/kg of fodder, and animals of the second experimental group were given Basulifor at a dose of 0.4 g/kg of fodder. Observation of the animals was carried out up to 120 days of age.

When performing this experimental work, the following research methods were used:

– zoohygienic – when assessing the microclimate in calf houses, temperature, relative air humidity were taken with the TKA-PKM (model 42), carbon dioxide concentration – using the Subbotin-Nagorsky method, ammonia, and hydrogen sulfide content – using the universal gas analyzer UG-2; air velocity - using TKA-PKM (model 50) thermal anemometer, concentration of microorganisms and dust in the air of the premises – using the Krotov apparatus;

– clinical-physiological – the body temperature, pulse rate, respiration rate were determined by generally accepted and approved methods in veterinary medicine;

– biochemical – the total protein content in the blood serum of animals was determined with IGF-454B-2M refractometer, separate fractions (albumin, alpha, beta and gamma globulins) – by the turbidimetric (nephelometric) method;

– hematologic – the number of erythrocytes, leukocytes, hemoglobin in the blood was determined using VetSanHM5 veterinary hematology analyzer [18];

– immunological – determination of IgA, IgM, IgG in the serum of animals – by the method of radial immunodiffusion in a gel [19];

– economic – the economic efficiency of using probiotic feed additives for growing young cattle was calculated according to the common method;

– statistical – biometric processing of the obtained digital data was carried out using Windows XP Professional.

Results. Before the beginning of the scientific and production test and during its implementation, regular measurement of the main parameters of the microclimate in the premises for keeping young cattle was carried out. The results of the study are shown in table 1.

As is seen from the table, the microclimate in the calf house mostly corresponded to zoohygienic requirements. The air temperature in the room, depending on the season, fluctuated at the level of 16.80±0.13 - 16.92±0.06 °C, relative humidity - 72.61±0.44 - 71.51±0.64%, air velocity - 0.14±0.02 - 0.16±0.08 m/s.

As known, harmful gases and solid aerosols have a certain negative impact on health and productivity of young farm animals. According to the research results, the concentration of ammonia in the room, depending on the season of the year, was at the level of 6.85±0.14 - 7.76±0.08 mg/m^3, carbon dioxide - 0.17±0.02 - 0.18±0.02%, hydrogen sulfide - 3.00±0.05 - 3.84 mg/m^3, solid aerosols - 6.68±0.14 - 6.89±0.16 mg/m^3. The basic parameters of the microclimate in a sectional calf house, to which animals were transferred from a calf preventative clinic, fluctuated in approximately the same indicators.

Table 1 – Zoohygienic parameters of the air environment in the calf house

Parameters	Group		
	Control	1 experimental	2 experimental
Air temperature, °C	16.80±0.13	16.76±0.14	16.92±0.14
Relative humidity, %	72.61±0.44	72.12±0.55	71.51±0.64
Air velocity, m/s	0.14±0.02	0.15±0.03	0.16±0.08
Contents: of ammonia, mg/m^3	6.85±0.14	7.56±0.10	7.76±0.09
Carbon dioxide, %	0.17±0.02	0.16±0.04	0.18±0.02
Hydrogen sulphide, mg/m^3	3.67±0.06	3.00±0.05	3.84±0.08
Solid aerosols, mg/m^3	6.68±0.14	6.76±0.12	6.89±0.16

Specified tested probiotic feed additive had an impact on the physiological parameters of the experimental calves (table 2).

Table 2 – Dynamics of physiological indices of calves when using Basulifor probiotic feed additive (M±m)

Index	Age of animals, days	Group of animals		
		Control	1 experimental	2 experimental
Body temperature, °C	1-2	38.14±0.05	38.11±0.06	38.14±0.08
	15	38.07±0.06	38.40±0.07*	38.47±0.10*
	30	38.47±0.09	38.86±0.12**	38.82±0.11**
	60	38.31±0.08	38.61±0.11*	38.66±0.13*
Pulse rate, min.	1-2	93.31±2.59	97.51±1.96	98.30±1.98
	15	89.62±1.88	96.72±1.99*	97.82±2.42*
	30	82.12±1.76	89.72±2.23**	89.92±2.35**
	60	77.53±1.84	85.41±2.32*	85.93±2.68*
Respiratory rate, min.	1-2	33.41±2.55	37.82±2.63	38.50±2.66
	15	29.41±1.69	36.01±1.88*	37.85±1.92*
	30	27.80±1.60	34.60±1.79**	36.40±1.60**
	60	27.32±1.26	34.42±1.74*	36.12±1.49*
Note: * P<0.05; ** P<0.01.				

The data in the table suggest that the introduction of this probiotic feed additive into the main diet of the experimental calves, compared to the control analogues, contributed to a slight increase in body temperature, ranging from 0.3 to 0.4 °C. Thus, in the first experimental group, where the probiotic feed additive was used at a dose of 0.3 g/kg of fodder, in 15, 30, 60 - days age cycle, the body temperature in animals fluctuated at the level of 38.40±0.07 °C, 38.86±0.12 °C, 38.61±0.11 °C; in the control group this index was characterized by 38.07±0.06, 38.47±0.09, 38.31±0.08 °C. The difference in favor of the experimental animals of this group, at the indicated age, was significantly higher on average by 0.30-0.39 °C (P<0.05), in the second experimental group of animals when using the feed additive at a dose of 0.4 g/kg of fodder, this difference was higher by 0.35 - 0.40 °C (P<0.05), respectively. At the same time, these discrepancies were within the limits of physiological fluctuations.

Against the background of the use of this probiotic feed additive, a change in the pulse rate occurred approximately along with a similar pattern. This indicator in experimental animals, compared with the control analogues, by the 15th day of the tests significantly increased by an average of 7.10-8.20 (P<0.05), by the 30th day - by 7.60 - 7.80 (P<0.05), and by the 60th day of the experiments – by 7.88 - 8.40 (P<0.05) beats per minute.

This feed additive had a definite effect on the respiratory rate. This parameter in the experimental groups of animals, compared with the control analogues, increased by 15-day age by 6.60 - 8.44, by 30 and 60-day age cycle – by 6.80 - 8.60 and 7.10 - 8.80 respiratory movements per minute (P<0.05) as a result of the use of this additive. The results of hematological studies are presented in table 3.

Table 3 – Hematological parameters in calves using Basulifor probiotic feed additive

Group of animals	Age, days	Hematological parameters		
		red blood cells, 10^{12}/l	leucocytes, 10^{9}/l	hemoglobin, g/l
Control	1-2	7.77±0.28	8.80±0.72	116.68±2.14
	15	6.23±0.24	8.10±0.56	108.66±1.92
	30	6.12±0.28	8.21±0.62	109.64±1.94
	60	6.38±0.26	8.57±0.68	109.84±1.96
1 experimental	1-2	7.25±0.30	8.82±0.79**	108.12±2.25
	15	6.46±0.38	8.22±0.64**	115.61±2.64**
	30	6.37±0.44	8.34±0.67	116.87±2.78**
	60	6.66±0.51	8.71±0.61	117.41±2.83
2 experimental	1-2	7.82±0.50	8.10±0.58	118.76±2.36
	15	6.49±0.49	8.23±0.65*	116.39±2.12
	30	6.39±0.38	8.36±0.68**	117.79±2.29**
	60	6.67±0.39	8.72±0.69	118.18±2.97
Note: * P<0.05; ** P<0.01				

On the first day of the feed additive application, the numbers of formed elements and hemoglobin in the blood of calves from the control and experimental groups were equal. As far as the experiment lasts, the indicated blood parameters change noticeably. So, the content of the number of red blood cells in calves of the first experimental group, compared with the control, on the 15th day of the experiment increased by 3.69% (P<0.05), on the 30th day - by 4.08% (P<0.05), on the 60th day of the experiment – by 4.38% (P<0.05).In the second experimental group, the growth of these indicators in the fixed dates of the experiment was 4.17, 4.41, 4.54% (P<0.05). The number of leukocytes in the blood of experimental animals also slightly increased in the range of 1.48 - 1.75% (P<0.5), however, with biometric processing of digital values, they were statistically unreliable.

A similar pattern was observed with respect to hemoglobin, the value of which changed upwards depending on the age characteristics and timing of the experiment. In the blood of animals of the first experimental group, it increased by 6.39 - 6.89% (P<0.01), in the second experimental group of calves – by 7.11 - 7.59% (P<0.01). It should be noted that the change in hematological parameters in the blood of experimental animals against the background of the use of the specified feed additive did not go beyond the limits of physiological fluctuations.

Indicators of the protein spectrum and immunological parameters of blood serum of calves on the back of the use of probiotic additives are shown in table 4.

Table 4 – Dynamics of total protein, protein fractions and serum immunoglobulins of calves when using the probiotic feed additive Basulifor

Parameters	Group		
	Control	1 experimental	2 experimental
total protein, g/l	65.82±0.78	67.98±0.82 *	68.00±0.86 *
Albumins, g/l	27.78±0.39	28.36±0.41 *	28.53±0.42 *
Globulins, g/l	38.04±0.44	39.45±0.46,*	39.64±0.48*
including alphaglobulins, %	12.62±0.22	11.16±0.20	11.24±0.21
beta-globulins, %	7.46±0.18	8.10±0.19	8.12±0.20
gamma – globulins, %	17.96±0.24	20.19±0.26 **	20.28±0.25 *
Immunoglobulins Ig «A», g/l	0.20±0.01	0.21±0.02**	0.21±0.02**
Immunoglobulins Ig«M», g/l	2.48±0.10	2.59±0.11*	2.62±0.12*
Immunoglobulins Ig «G», g/l	19.32±0.26	20.42±0.30 *	20.46±0.33 *
Note: * P<0.05; ** P<0.01			

The digital data of the table show that the level of total protein in the blood serum of the first group experimental animals, compared with the control analogues, under the influence of the probiotic feed additive Basulifor, slightly, but significantly increased on the 30th day of the test on average by 3.28% (P<0.05), in the second group experimental animals – by 3.31% (P<0.05). The rise in the level of total protein in the blood serum of the experimental animals was mainly due to albumins, an average of 2.69 and 2.08% (P<0.05) and gamma-globulins, which reliable growth in the experimental groups of animals amounted to 12.41–12.91% (P<0.01) compared with control analogs.

Further investigations have shown that the level of immunoglobulins A in the blood serum of the experimental calves when using the probiotic feed additive Basulifor slightly increased compared to the control animals. Thus, this parameter in the serum of calves of both experimental groups, relating to the control one, was significantly higher on average by 5.00% (P<0.01). As is well known, in addition to serum, immunoglobulins A are found in secrets on the surface of mucous membranes and are synthesized in plasma cells of the spleen, lymph nodes and mucous membranes. Secretory Ig"A" play a significant role in local immunity, since they prevent the adhesion of microorganisms to epithelial cells of the mucous membranes of mouth, intestines, respiratory and urinary tracts. At the same time, this immunoglobulin in an aggregated form activates the complement in an alternative way, which leads to the stimulation of local phagocytic protection [20].

When using the probiotic feed additive Basulifor, the growth of immunoglobulins M in the serum of the experimental calves of the first group was characterized on average by 4.43% (P<0.05) compared with those of the intact group, of the second experimental group – by 5.64% (P<0.01). The researchers found that Ig M begins to be synthesized in the body of the fetus and appear first in the serum after immunization of animals with most antigens. This immunoglobulin class belongs to a large part of normal antibodies – isohemagglutinins, which are presented in the blood serum of animals, belonging to certain blood groups.

The introduction of the tested feed additive into the basic diet had a similar positive effect on the level of immunoglobulins G. Thus, an increase in this parameter in the serum of the experimental calves of the first group was on average by 5.69% (P<0.05), in the second experimental group of animals – by 5.90% (P<0.05). Immunoglobulin G is the only class of antibodies that penetrates the placenta into the fetus. After the birth of the fetus, the content of Ig “G” in the serum drops and reaches its minimum concentration by 3-4 months, after which it begins to increase due to the accumulation of its own content.

On the back of the use of the probiotic additive, an enhance of the intensity of the live weight gain was observed in the experimental calves (table 5).

From the figures in the table it can be seen that in the experimental groups of calves, the average daily live weight gain was significantly higher. So, in the control group of calves on the 15-, 30-, 60-days of the test, this indicator gradually increased from 365.18±20.12 to 668.12±32.36 g.

In the first experimental group with the use of feed additive, depending on the age characteristics and timing of the experiment, the growth of this indicator was significantly higher and ranged from 382.00±21.52 to 718.10±33.51 g, which is 336.10 g, and in the second experimental group - from 383.10±22.12 to 720.36±34.28 g, with a difference of 337.26 g.

Table 5 – Indicators of the average daily gain in live weight of calves when using a probiotic feed additive (M±m).

Age, days	Group		
	Control	1 experimental	2 experimental
1	31.55±0.60	32.12±0.78	31.68±0.67
15	365.18±20.12	382.00±21.52 *	383.10±22.12 *
30	496.64±26.43	525.82±31.34 *	528.14±31.08*
60	668.12±32.36	718.10±33.51**	720.36±34.28**
Note: * P<0.05; ** P<0.01			

On the 60thday of the test, the variation in weight gain in the first experimental group of calves, compared with the control analogues, was higher on average by 7.48% (P<0.01), in the second experimental group - by 7.81% (P<0.01).

Summary.

1. Under the influence of the probiotic feed additive Basulifor, containing microorganisms of the Bacillus subtilis and Bacillus licheniformis strains, the body's physiological parameters, hematological, biochemical, and immunological parameters of blood serum in young cattle are activated.

2. On the back of the use of the probiotic feed additive, there is an increase in meat productivity of calves, which is expressed by stimulation of the intensity of the average daily weight gain.

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БАСУЛИФОР ПРОБИОТИКАЛЫҚ АЗЫҚ ҚОСЫНДЫСЫН ҚОЛДАНУ КЕЗІНДЕ ТӨЗІМДІЛІК, ӨНІМДІЛІК ЖӘНЕ БҰЗАУ ЕТІНІҢ САПАСЫ

Аннотация. Жұмыс мақсаты – бұзауларды өсіруде«Басулифор» пробиотикалық азықтық қоспаларды қолданудың зоотехникалық және ветеринарлық қажеттілігін анықтау. Ғылыми-шаруашылықтық тәжірибиелер Чубаш Республикасының Янтиков ауданының «Акконд-Агро» АҚ сүтті комплексінде, 2018 ж қысқы және көктем мезгілінде Чубаш Республикасының мемлекеттік ветеринарлы қызметі және Чубаш мемлекеттік ауылшаруашылық академиясының морфология, акушерства және терапия кафедрасының биохимиялық зертханасы «Чубаш Республикасының ветеринарлы зертханасы»жүргізілді.

Зерттеулер дені сау, жақсы дамыған, орташа дамыған бір апталық тірі салмағы 32 – 34 кг, қара – ала 45 бұзауларға жүргізілді. Жануарларға үш топқа бөлінді (бақылау және екі тәжірбиелік топ) әр топта 15 бастан. Бұзаулар жеке секцияларда бағылды, азықтандыру жағдайы және бағылуы барлық топтарда бірдей. Бұзауларды 10–12 тәуліктен бастап сабанға және қосымша азыққа үйретілді. Бақылау тобына қарағанда, бірінші топтағы бұзауларға 30 тәулік барысында сүтпен біргеі ал 31 және 90 аралығында комбикорммен бірге қосымша 1 кг / 0,3 г құрғақ есеппен Басулифорберді, ал екінші топ жануарларына 0,4 г/кг азық берілді. Жануарларды бақылауды 120 тәуліктік жасқа дейін жүргізілді.

Мемлекеттің азықтық қауіпсіздік мәселелерін шешуде мал шаруашылығындағы негізгі талап максимальды жоғары, сапалы жұқпалы және инвазиялық аурулары жоқ жануарларды алу. Бұл тұрғыда тиімділігі жоғары биологиялық белсенді препараттарды қолдану, оның қатарында жаңа пробиотикалық қоспаларды ірі қара төлдерін өсіруде жаңа пробиотикалық қоспаларды азығына қосу өзекті мәселе болып табылады.

Сыналып отырған «Басулифор» азықтық қоспасы аздап дене температурасын, тыныс алу және жүрек қағысын жиілетеді. Алайда, бұл көрсеткіштер физиологиялық норма шегінде болды. Тәжірбиелі жануарларда физиологиялық өзгерістер болатынын басқада зерттеушілер анықтаған, ол пробиотикалық азықтық қоспа құрамына кіретін спора түзетін бактерияларда синтизделетін биологиялық белсенді заттардың тотығу – тотықсыздану процестерінің әсерінен болатын ағзаға әсер етуінен деп түсіндірілді.

Бақылаумен салыстырғанда, 0,3 г/кг және 0,4 г/кг тәжірбиелік топтағы бұзауларда 15 тәулікте орташа тәуліктік өсім4,60-4,90%, 30 тәулікте - 5,87-6,34%, 60 тәулікте - 7,48-7,81%, жануарлар қанында эритроциттер 3,69-4,54%, лейкоциттер - 1,48 - 1,75%, гемоглобин – 6,39 - 7,59 %, қан сарысуындағы жалпы ақуыз - 3,28-3,31% (P<0,05),альбуминдер – 2,08-2,69% (P<0,05), глобулиндер – на 3,70-4,20% (P<0,05), гамма-глобулиндер – на 12,41 - 12,91% (P<0,01). Аталған пробиотикалық азықтық қоспаны бұзаулардың азығына қосу бақылаудағы аналогтармен салыстырғанда, қос топтың жануарлардың иммуноглобулиндерінде класс «А»5,00% (P<0,05),«М» – 4,43-5,64% (P<0,01), «G» – 5,69-5,90% (P<0,05) өсуіне себепші болды, бұзаулардың өлім – жітімін азайту 3,22-3,69% (P<0,05).

Түйін сөздер: бұзаулар, өміршеңдік, онімділік, пробиотиктер, Басулифоразықтыққоспасы, резистенттілік, өлім – жітімін азайту.

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РЕЗИСТЕНТНОСТЬ, ПРОДУКТИВНОСТЬ И КАЧЕСТВО МЯСА ТЕЛЯТ ПРИ ИСПОЛЬЗОВАНИИ ПРОБИОТИЧЕСКОЙ КОРМОВОЙ ДОБАВКИ БАСУЛИФОР

Аннотация. Цель настоящей работы – определение зоотехнической и ветеринарной целесообразности применения пробиотической кормовой добавки «Басулифор» при выращивании телят.

Научно-хозяйственный опыт проведен на молочном комплексе АО «Акконд-Агро» Янтиковского района Чувашской Республики, БУ ЧР «Чувашская Республиканская ветеринарная лаборатория» Государственной ветеринарной службы Чувашской Республики и в биохимической лаборатории кафедры морфологии, акушерства и терапии Чувашской государственной сельскохозяйственной академии, в зимний и весенний периоды 2018 г.

Исследования проведены на здоровых, хорошо развитых, средней упитанности, недельного возраста, живой массой 32-34 кг 45 телятах черно-пестрой породы. Животные по принципу групп-аналогов были разделены на 3 группы (контрольная и две опытные) по 15 голов в каждой. Телят содержали в отдельных секциях, условия кормления и содержания были одинаковыми для всех групп. К поеданию сена и комбикорма телята приучались с 10-12-суточного возраста. В отличие от контрольной группы, телятам первой опытной группы в течение 30 суток с молоком, а с 31 по 90 сутки с комбикормом дополнительно давали Басулифор сухой из расчета по 0,3 г/кг корма, а животным второй опытной группы – по 0,4 г/кг корма. Наблюдения за животными проводили до 120-суточного возраста.

При решении проблемы продовольственной безопасности страны основной задачей в животноводстве является получение максимально высокой, качественной продукции и недопущение возникновений инфекционных и инвазионных заболеваний животных. В этой связи испытание и применение новых высокоэффективных биологически активных препаратов, в том числе новых пробиотических добавок к корму при выращивании молодняка крупного рогатого скота, несомненно, имеет актуальность.

Испытываемая кормовая добавка «Басулифор» вызвала незначительное повышение температуры тела, частоты сердечных сокращения и дыхания. Однако эти показатели находились в пределах физиологических норм. Такие незначительные изменения физиологических параметров у опытных животных на фоне применения пробиотиков устанавливали и другие исследователи, которые связывают их с усилением интенсивности окислительно-восстановительных процессов в организме под воздействием биологически активных веществ, синтезируемых спорообразующими бактериями, входящими в состав указанных пробиотических кормовых добавок.

На фоне применения пробиотической кормовой добавки из расчета 0,3 г/кг и 0,4 г/кг корма, у подопытных телят, по сравнению с аналогами в контроле, происходило достоверное повышение среднесуточного прироста живой массы на 15-е сутки опыта на 4,60-4,90%, 30-е сутки – на 5,87 - 6,34%, 60-е сутки – на 7,48 - 7,81%, в крови животных количества эритроцитов – на 3,69 - 4,54%, лейкоцитов – на 1,48 - 1,75%, гемоглобина – на 6,39 - 7,59 %, в сыворотке крови уровня общего белка на 3,28 - 3,31% ($P<0,05$), альбуминов – на 2,08 – 2,69% ($P<0,05$), глобулинов – на 3,70 - 4,20% ($P<0,05$), гамма-глобулинов – на 12,41 - 12,91% ($P<0,01$). Введение в рацион телят указанной пробиотической кормовой добавки способствовало незначительному росту в сыворотке крови у опытных телят, по отношению к аналогам в контроле иммуноглобулинов классов «А» в обеих опытных группах животных на 5,00% ($P<0,05$), «М» – на 4,43 - 5,64% ($P<0,01$), «G» – на 5,69 - 5,90% ($P<0,05$), повышению сохранности телят – на 3,22 - 3,69% ($P<0,05$).

Ключевые слова: телята, жизнеспособность, продуктивность, пробиотики, кормовая добавка Басулифор, резистентность, сохранность.

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