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Efficacy Of Probiotics In The Pig.

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ABSTRACT

To accelerate the growth of piglets and increase their natural resistance under production conditions, various biologically active substances are often used. As experience shows, the enrichment of feed rations with essential amino acids, enzyme preparations and vitamins reduces the waste of young, significantly increases the absorption of feed and reduces their costs per unit of output, allows partially replace expensive and scarce animal feed with cheaper plant foods, as well as increase animal productivity while improving product quality. The aim of our work was to study the effect of new stimulant and vitoform preparations on the productivity and natural resistance of weaner piglets. As a result of the conducted research, high growth-promoting activity and the biological availability of the stimulus and Vitofarm were established, which was manifested by an increase in the average daily pig growth (by 6.2 and 6.7% above the control). After the application of stimular and Vitaferm, there was an increase in serum protein by 12.9 and 13.3%, a decrease in creatinine by 17.2 and 16.9%, a decrease in the activity of lactate dehydrogenase by 20.9 and 22.2% and aspartate aminotransferase - by 17, 8 and 18.5%, respectively, compared with the control. To increase gains, normalize protein metabolism and the functional state of the liver, it is recommended to inject rations of piglets at the rate of 5.0 g / kg and vitoforms at the rate of 8.0 g / kg of feed throughout the entire rearing period.

Keywords: Stimular, vitaferm, prebiotics, vitamins, enzymes, weaners, diets, natural resistance.

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INTRODUCTION

Practical use of prebiotics in piglet diets is not always given sufficient attention, although numerous studies have proven the feasibility and economic efficiency of using these substances in feeding farm animals [9].

The lack of prebiotics in pig feeds (essential amino acids, vitamins and enzymes) leads to disruption of protein metabolism, reduction of the body's natural resistance. In this connection, the efforts of domestic and foreign scientists are aimed at developing unconventional protein sources and increasing the efficiency of their use in pig farming [8, 10].

The full value of protein nutrition depends mainly on the presence of a complex of amino acids in it that meet the physiological needs of the body [11, 14]. Amino acids play a major role in metabolism, they are regulators of the normal state of the body. In addition, they are structural functions, entering into the composition of antibodies and antitoxins, enzymes, hormones and serve as transport for the transfer of lipid-mineral compounds, vitamins, etc. With the exception of ten essential amino acids, the rest can be synthesized in the body of pigs during the transamination [1, 5].

If the feed lacks at least one vital amino acid, then the protein in the body of the animal is not formed. For this reason, the quality of feed is more important than their quantity. If the protein content in the feed is below average, this will not greatly affect the feed consumption and the growth rate of the animal. However, if the feed lacks at least one amino acid or there is an imbalance, then all this will have a negative impact on the growth of the animal [7].

Optimal provision of pigs with vitamins also has a great influence on the productivity of animals and the quality of their products. Many scientists confirm with their research that the use of beta-carotene and vitamins with antioxidant properties in sick animals leads to their more rapid recovery [15, 12].

The most toxic radical lipid peroxidation products are removed mainly by biological antioxidants, which include phenolic antioxidants - alpha-tocopherol, flavonoids, etc. Their effects are enhanced by cysteine, methionine, and vitamins A and C, beta-carotene [16].

It is believed that vitamins with antioxidant properties and carotene retain the structure, permeability and functional activity of cellular and subcellular membranes, which leads to stimulation of the body's immune response and protection from the damaging effects of free radicals [4, 6].

Vitamin E is considered the most powerful natural antioxidants. In this case, only reduced forms of vitamin E are involved in inhibiting lipid peroxidation, and ascorbic acid is the reducing agent for tocopherol. Vitamin E effectively interacts with free radicals of lipids and inhibits lipid peroxidation processes [13].

Thus, the search for new effective drugs that combine immunostimulating, antioxidant and hepatoprotective properties remains very relevant at present, [6, 12].

Based on this, we, together with the scientists-chemists of Petrokhim CJSC (Belgorod), developed complex preparations: stimular and vitaferm, whose composition is represented by prebiotics.

Stimular - feed protein-vitamin supplement, contains in its composition - fermentolizat spleen (70%); pepsin (0.2%); chalk feed (26.8% of the mass) and vitamin premix (3%) based on 1 g of stimulant: Vit. A - 500ME, Vit. D3 - 44ME, Vit. E - 0.7 mg, Vit B1 - 0.17 mg, Vit. B2 - 0.17 mg, Vit. B6 - 0.18 mg, Vit. PP - 2 mg, folic acid - 0.06 mg, pantothenic acid - 0.8 mg, biotin 0.022 mg, B12 - 0.36 mg, vitamin C - 9 mg.

Vitaferm - feed vitamin-enzyme supplement. 1 g of the drug contains enzymes: pepsin - 1.5 mg, pancreatis - 1.5 IU; and vitamins: A-500ME; E - 0.74 mg; B1 - 0.17 mg; B2-0.17 mg; D3- 44ME; B6 - 0.18 mg; PP-2mg; folic acid, 0.06 mg; Pantothenic acid - 0.75 mg; Biotin - 0.002 mg; B12, 0.36 µg; C, 9.2 mg; citric acid - 20 mg; the rest is sucrose.

The aim of our work was to study the effect of stimulus and vitoform on the productivity and natural resistance of weaner piglets.

MATERIALS AND METHODS

The formation of groups was carried out taking into account the breed, sex, age, body weight and animal health. Biochemical parameters were determined by standard methods. The Hitachi hematology analyzer was used.

The nature of the effect of stimulant and vitoform on the animal organism was judged by clinical indicators, changes in protein, carbohydrate and mineral metabolism, growth rate and preservation of piglets.

Serum lysozyme activity was determined by the nephelometric method [2], phagocytic activity by counting phagocytic neutrophils from 100 cells, bactericidal activity of the blood serum according to I.M. Carpath [3].

The digital material obtained in all experiments was subjected to statistical processing on a personal computer using generally accepted methods of variation statistics with the calculation of the Student argument (td). The difference between the compared values was considered reliable at $p \leq 0.05$.

RESULTS AND DISCUSSION

At the same time, according to the principle of analogs, 3 groups of 27-day old weaned pigs of 40 animals each were formed. The first group was the control and received a standard diet. In the second experimental group, in addition to the ration, a stimular was applied, in the third experimental group of Vitaferm. The scheme of the experiment is presented in table. 1. The experimental period lasted for 50 days.

Table 1 - Piglet Experiment

Groups	Drug, dose
1 control	Feed according to the scheme adopted in the farm
2 experienced	RR + stimular (5.0 g / kg feed)
3 experienced	PR + Vitaferm (8.0 g / kg feed)

It should be noted that the highest average daily gains were observed in piglets of the second and third experimental groups (6.2 and 6.7%, respectively, higher than the control). At the same time, feed costs for growth were lower in these same animals by 2.7 and 3.1% below the control indicators (Table 2).

Table 2 - The results of the test stimular and Vitaferm on piglets

Indicators	1 control	Groups	
		2 experienced	3 experienced
The number of goals when setting on the experience	40	40	40
Number of goals at the end of the experience	40	40	40
Safety, %	100	100	100
Average daily gain, g	440,7±6,25	468,3±7,19	470,2±7,32
Feed costs per 1 kg gain, (feed conversion / kg)	2,22±0,80	2,16±0,93	2,15±0,84

Thus, both studied drugs had a positive effect on the safety and productivity of animals. After the application of the stimulator and vitoferm, the average daily gains and feed conversion of the piglets from the experimental groups were higher than in animals of the control group.

The biochemical composition of the blood of animals is presented in table. 3

Table 3 - Piglets biochemical blood parameters

Indicators	Groups		
	1 control	2 experienced	3 experienced
Initial data			
Total protein, g / l	46,2±1,19	44,1±1,18	43,9±1,22
Albumin, g / l	32,7±1,23	33,2±1,26	34,1±1,21
Calcium, mmol / l	2,27±0,53	2,36±0,43	2,38±0,44
Phosphorus, mmol / l	2,56±0,31	2,40±0,35	2,39±0,21
Urea, mmol / l	3,6±0,41	3,7±0,27	3,4±0,32
Creatinine umol / l	101,6±2,82	100,1±2,94	100,6±2,15
ЛДГ, ed/l	736±20,27	741±21,26	738±20,22
AST, ed/l	76,6±2,15	75,8±1,97	75,4±1,88
ALT, ed/l	38,8±1,52	38,9±1,45	37,7±1,46
After the use of drugs			
Total protein, g / l	50,3±1,18	56,8±1,19**	57,0±1,20**
Albumin, g / l	36,3±1,29	34,7±1,22	35,3±1,33
Calcium, mmol / l	2,31±0,38	2,79±0,21	2,84±0,36
Phosphorus, mmol / l	2,7±0,30	2,6±0,32	2,5±0,24
Urea, mmol / l	3,9±0,21	3,6±0,32	3,7±0,28
Creatinine umol / l	102,5±3,82	84,9±3,91**	85,2±3,79**
ЛДГ, ed/l	731±31,34	578±33,42**	569±32,53**
AST, ed/l	73,4±2,46	60,3±2,50**	59,8±2,64**
ALT, ed/l	48,43±1,40	45,30±1,64	46,16±1,43

** - p<0,01;

From the data presented in the table, it is clear that at the end of the experimental period, piglets from the second and third experimental groups, where they used stimulants and vitapheres, showed an increase in serum protein by 12.9 and 13.3%, a decrease in creatinine by 17.2 and 16, 9%, a decrease in the activity of lactate dehydrogenase by 20.9 and 22.2% and aspartate aminotransferase - by 17.8 and 18.5%, respectively, while the difference with the control was confirmed statistically (p <0.01).

Analyzing the data presented in the table, one can argue about the positive effect of stimulus and vitamin farm on the protein metabolism in the body of piglets, as evidenced by the increase in serum protein.

It should be noted the effective effect of drugs on the functional state of the liver of animals, which led to a decrease in blood creatinine and a decrease in the activity of organospecific enzymes. At the next stage, we studied the effect of stimulus and vitofarm on some indicators of natural resistance (Table 4).

Table 4 - Indicators of natural resistance of pigs

Indicators	Groups		
	1 control	2 experienced	3 experienced
		stimular	vitaferm
Initial data			
Bactericidal activity,%	32,18±1,57	31,67±1,52	33,14±1,69
Phagocytic activity,%	40,74±1,37	42,12±1,29	41,39±1,47
Lysozyme activity,%	10,21±0,39	10,52±0,43	10,33±0,54
After the use of drugs			
Bactericidal activity,%	36,20±1,64	38,53±1,76	38,26±1,60
Phagocytic activity,%	44,22±1,60	50,63±1,58*	51,24±1,69*
Lysozyme activity,%	11,23±0,40	11,69±0,65	11,741±0,72

*- p<0,05

The data presented in the table indicate a positive effect of both drugs on non-specific resistance of animals, especially with regard to cellular factors.

At the end of the experimental period, the phagocytic activity of leukocytes in piglets of the second and third experimental groups increased by 14.5 and 15.9% compared with the control, with p <0.05.

There was also an increase in the bactericidal activity of the blood serum, but these changes were not confirmed statistically, which should be considered as a trend.

Thus, the use of stimulus and vitaverma causes the activation of certain factors of nonspecific protection, which can be explained by the biological properties of the substances that make up the preparations, in particular vitamins.

Thus, vitamin E is involved in the biosynthesis of antibodies in animals, acts as a regulator of protein synthesis, an antioxidant or regulator of redox processes. [17].

It is also reported that ascorbic acid has a stimulating effect on the phagocytic activity of leukocytes and on the formation of antibodies. Vitamin C can stimulate the production of interferons (proteins that protect cells from virus attack).

CONCLUSION

Thus, on the basis of the conducted research, we recommend introducing stimular into the weaning piglets rations at the rate of 5.0 g / kg of feed and Vitaferm at the rate of 8.0 g / kg of feed to increase the body's productivity and natural resistance.

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