

The effect of probiotic feed additives such as Prolam and Bacell on resistance of the pig body

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Abstract.

Saving money on feeding and maintenance is today the main task for all animal husbandry. This goal was achieved only with the advent of special food additives in the feed. Probiotic for the rapid growth of pigs and pigs can reduce the cost of long-term maintenance of animals and their care, as well as increase profits from the sale of pork. Thanks to probiotics for pigs, the opportunity to reduce the cost of purchasing expensive feed has appeared. We have studied the effect of new probiotic feed additives Prolam and Bacell on the morphological, biochemical and immunological parameters of the blood of an organism in piglets. The experiments were conducted in the agricultural processing complex named after Lenin of the Cheboksary District of the Chuvash Republic where 3 groups of 15 animals were formed. It is established that these supplements increase the natural resistance of the body to piglets.

Key words: probiotic, resistance, Prolam, Bacell.

INTRODUCTION.

Currently, the problem of obtaining environmentally friendly meat products is becoming more urgent due to the intensification of pig farming. Antibiotics and hormonal drugs that have a negative impact on the animal resistance and the quality of the products obtained from them are widely used in pig industry [1,2,3]. The residual amount of these drugs in pig meat adversely affects human health. In such circumstances, probiotic feed additives, which are environmentally safe and effective, play a special role [4,5,6]. Probiotic additives have a complex effect on the animal body, improve digestion, increase feed conversion, enhance nonspecific immunity, resulting in increased safety and productivity of farm animals [6,7,8]. One of the recently created highly effective probiotic feed additives is Prolam and Bacell (produced by LLC Biotechagro, Russia). Prolam contains viable lactic acid bacteria of *Lactobacillus delbrueckii* subsp. *bulgaricus* (B-5788), *Lactobacillus acidophilus* 43c (B-3235), Lactic *Streptococcus* of *Lactococcus lactis* subsp. *lactis* 574 (B-3145), *Lactococcus lactis* subsp. *lactis* 1704-5 (B-3192), bifidobacteria of *Bifidobacterium animalis* 83 (AS-1248). Bacell consists of the microbial mass of the spore-forming bacteria *Bacillus subtilis* 945 (B5225); acidophilic bacteria *Lactobacillus acidophilus* L917 (B-4625); *Ruminococcus albus* 37 (B-4292) [8,9]. The purpose of this work is to study the effect of probiotics Prolam and Bacell on individual indicators of nonspecific resistance of the pig organism.

MATERIALS AND METHODS.

The scientific and economic experience was carried out at the integrated agricultural production centre named after Lenin of the Cheboksary district of the Chuvash Republic during the period from April to June, 2011. According to the method of pairs-analogues 3 groups of day-old pigs of 15 animals each were formed (table 1).

Pigs of the first experimental group, starting from the first day of life and before weaning with weekly courses (with a week break) were administered orally at the rate of 3 ml per head per day. Pigs of the second experimental group received Bacell, starting from the 8th day of life, daily at the rate of 0.3% of the feed weight. The third group served as control. The conditions of feeding, keeping, care, as well as the microclimate in the production facilities for all groups were identical and met the standards. For definition of morphological indicators of blood and factors of

nonspecific resistance of an organism defined: the number of erythrocytes and leukocytes in the Gorjaev's chamber, the hemoglobin content by Sali's hemometer, the total protein level by the refractometer, the serum protein fractions – turbidimetric, the serum lysozyme activity in relation to the lysing micrococcus, the serum bactericidal activity in relation to *E. coli*, phagocytic activity in relation to *staphylococcus*.

RESEARCH RESULTS.

During experiences the general condition of pigs of all groups was estimated as satisfactory. Indicators of temperature, pulse and respiration were within the physiological norm. The study's results of morphological, biochemical and immunological parameters of animal blood are presented in table 2.

From the data given in the table it can be seen that the number of erythrocytes, leukocytes and hemoglobin in animals of all groups was within the physiological norm. At the same time, there was an increase in the number of erythrocytes and hemoglobin in groups 1 and 2, respectively, by 7.4% and 7.6% and 9.7% and 8.3%, a decrease in the number of leukocytes by 5.7% and 3.6%. Stimulating erythropoiesis and hemoglobin synthesis, probiotics under study increase the intensity of metabolism. The concentration of total protein in blood serum in all experimental groups had no significant differences. The increased content of albumin fractions in the 1st and 2nd experimental groups by 6.1% and 5.0%, respectively, is associated with more intense metabolic processes in the body of pigs of experimental groups compared to the control. The reduced content of globulins of the 1st and 2nd experimental groups compared to the control group by 11.2% and 7.9%, respectively, indicates the presence of suppression processes of pathogenic microflora in pigs. During the entire period of the experiment, the level of bactericidal activity of blood serum of pigs of the experimental groups was higher than in the control group by 3.7% and 6.1% of group 1 and % of group 2. Lysozyme activity of blood serum of groups 1 and 2 was higher than in the control group by 5.8% and 4.0%, respectively, phagocytic activity by 8.0% and 9.4%. Having a pronounced therapeutic and preventive effect, probiotic feed additives Prolam and Bacell when administered in the diet stimulate erythropoiesis, hemoglobin synthesis, increase bactericidal, lysozyme activity of blood serum, phagocytic activity of blood, thereby activating the natural resistance of the animal body.

Table 1 - The scheme of the experiment

Group	Number of animals, heads	Feeding conditions
1st experimental	15	Basic diet + Prolam at a dose of 3 ml per head courses of 7 days in 7 days before weaning
2nd experimental	15	Basic diet + Bacell 0.3% by weight of feed
3rd control	15	Basic diet

Table 2-Morphological, biochemical and immunological parameters of pig blood

Index	Animal groups		
	1st experimental	2nd experimental	control
Erythrocytes, $\times 10^{12} / l$	5,63 \pm 0,05	5,64 \pm 0,08	5,24 \pm 0,07
Leukocytes, $\times 10^9 / l$	16,25 \pm 0,04	16,61 \pm 0,06	17,23 \pm 0,07
Hemoglobin, g / l	102,53 \pm 0,9	101,21 \pm 1,3	93,45 \pm 1,4
Total protein, GM/DL	62,37 \pm 0,8	63,15 \pm 0,8	64,23 \pm 0,6
Albumins, GM/DL	33,24 \pm 0,4	32,887 \pm 0,6	31,32 \pm 0,4
Globulins, GM/DL including:	29,25 \pm 0,4	30,35 \pm 0,5	32,93 \pm 0,3
α -globulins	9,24 \pm 0,1	9,30 \pm 0,2	10,17 \pm 0,2
β -globulins	8,78 \pm 0,1	8,23 \pm 0,1	9,34 \pm 0,1
γ -globulins	11,24 \pm 0,2	12,82 \pm 0,2	13,58 \pm 0,1
Bactericidal activity of serum, %	65,43 \pm 0,6	66,98 \pm 0,7	63,12 \pm 0,4
Blood serum lysozyme activity, %	39,65 \pm 0,4	38,98 \pm 0,6	37,47 \pm 0,3
Phagocytic activity of blood,%	24,34 \pm 0,3	24,65 \pm 0,3	22,54 \pm 0,4

CONCLUSION.

Thus, the analysis of the data obtained as a result of the studies allows to conclude that probiotic feed additives Prolam and Bacell increase the natural resistance of the pigs.

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