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НАУКА И ОБРАЗОВАНИЕ В СОВРЕМЕННОМ МИРЕ: ВЫЗОВЫ XXI ВЕКА



Нур-Султан, Казахстан



**ОБЪЕДИНЕНИЕ ЮРИДИЧЕСКИХ ЛИЦ В ФОРМЕ
АССОЦИАЦИИ «ОБЩЕНАЦИОНАЛЬНОЕ
ДВИЖЕНИЕ «БОБЕК»
КОНГРЕСС УЧЕНЫХ КАЗАХСТАНА**



«SCIENCE AND EDUCATION IN THE MODERN WORLD:
CHALLENGES OF THE XXI CENTURY»

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ГЛАВНЫЙ РЕДАКТОР:

Е. Абиев (Казахстан)

Ж.Малибек, профессор;

Ж.Н.Калиев к.п.н.;

Лю Дэмин (Китай),

Е.Л. Стычева, Т.Г. Борисов (Россия)

Чембарисов Э.И. д.г.н., профессора (Узбекистан)

Салимова Б.Д. к.т.н., доцент (Узбекистан)

Худайкулов Р.М. PhD (Узбекистан)

Заместители главного редактора: Е. Ешим (Казахстан)

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«SCIENCE AND EDUCATION IN THE MODERN WORLD: CHALLENGES OF THE XXI CENTURY» атты X Халықаралық ғылыми-тәжірибелік конференция материалдары жинағына Қазақстан, Ресей, Қытай, Түркия, Белорус, Украина, Молдова, Қырғызстан, Өзбекстан, Тәжікстан, Түрікменстан, Грузия, Монғолия жоғары оқу орындары мен ғылыми мекемелердің қызметкерлері мен ұстаздары, магистранттары, студенттері және мектеп мұғалімдерінің баяндамалары енгізілді. Жинақтың материалдары жоғары оқу орнындары мен ғылыми мекемелердегі қызметкерлерге, оқытушыларға, мектеп және колледж мұғалімдеріне, магистранттар мен студенттерге арналған.

X Международная научно-практическая конференция «НАУКА И ОБРАЗОВАНИЕ В СОВРЕМЕННОМ МИРЕ: ВЫЗОВЫ XXI века», включают доклады ученых, студентов, магистрантов и учителей школ из разных стран (Казахстан, Россия, Китай, Турция, Белорусь, Украина, Кыргызстан, Узбекистан, Таджикистан, Молдавия, Туркменистан, Грузия, Монголия). Материалы сборника будут интересны научным сотрудникам, преподавателям, учителям средних школ, колледжей, магистрантам, студентам учебных и научных учреждений.

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**USE OF PROBIOTICS IN FEED FOR FATTENING PIGS - GUARANTEE OF
QUALITY AND SAFE PRODUCTS****Oksana Kuzmenko¹, Olena Tytariova¹, Anna Horchanok²**¹Bila Tserkva National Agrarian University, Bila Tserkva, Ukraine²Dnipro State Agrarian and Economic University, Dnipro, Ukraine

Annotation. Based on the data obtained during the experiment, it has been proven that the addition of mannan-oligosaccharides in the form of Bio-Mos prebiotic to the compound feed during 120 days of the fattening period has a positive effect on the qualitative and quantitative composition of the microorganisms of the digestive tract of pigs compared to use of feed antibiotic Biovit during 90 days. According to the results of the experiment, the Bio-Mos prebiotic as a feed supplement during the entire fattening period helps to increase the growth rate of fattening pigs by changing the number of opportunistic and symbiotic microorganisms.

Key words: young pigs, fattening, mixed feed, nutrients, prebiotic, mannan-oligosaccharides, blood, products.

Uncontrolled use of antimicrobial preparations in animal husbandry has led to the rapid formation of antibiotic-resistant strains of pathogenic microorganisms, which reduces the role of these preparations as a therapeutic and prophylactic agent (Dyachenko L.S. et al., 2017). Therefore, microorganisms more often develop multiple resistance, i.e. resistance to many antibiotics. At the same time, the control of enteropathogens in animal husbandry without antibiotics is impossible (Jahanian R. and Ashnagar M., 2015).

Subclinical bacterial diseases of the digestive tract do not allow animals to achieve maximum productivity. To reduce the number of pathogenic intestinal microflora, feed antibiotics were used everywhere and this led to the emergence of antibiotic-resistant strains of bacteria, cross-resistance of microorganisms to antibiotics used for human treatment (Hou Chengli et al., 2015).

Numerous studies with various substances have been conducted in search of alternatives to antibiotics, and impressive results have been obtained in experiments with oligosaccharides, especially mannan-oligosaccharides (MOS) isolated from the cell walls of the yeast *Saccharomyces cerevisiae*. This preparation is not just an alternative to antibiotics, it has a broader spectrum of action at the cellular and humoral levels.

Mannan oligosaccharide exerts a significant growth promoting effect by enhancing the animal's resistance to enteric pathogens. Mos, a mannan oligosaccharide derived from the cell wall of the yeast *Saccharomyces cerevisiae* is commercially available as a feed supplement and regarded as safe compound (Ferket, 2004).

Studies have shown promising results and a remarkable benefit from using Mos as an alternative growth promoter antibiotic in broiler diets compared to the growth promoter antibiotic enramycin (Zakeri & Mahdavi, 2006).

Mannan oligosaccharides (MOS) may be incorporated at 0.2% level in diet for improved physico-chemical indices, antioxidant and oxidative stability and carcass characteristics of broiler chickens meat and it may be suitable replacer of antibiotic growth promoter (Biswas, A. et al., 2021).

Adding to the compound feeding of young pigs on fattening prebiotic Bio-Mos on the basis of mannan-oligosaccharides during the whole period of fattening positively affects the qualitative and quantitative composition of the conditionally pathogenic and symbiotic microflora in the digestive tract. According to the data, the number of lactobacilli in the feces of pigs that consumed





the prebiotic Bio-Mos, compared to the control, changed insignificantly, however, by the end of the experiment their number increased by 16%. It is known that in the absence of appropriate conditions for the growth of symbionts in the intestine, a decrease in their number occurs, however, in the feces of the test group pigs the amount of bifidobacteria during the entire period of the experiment was significantly higher than that of the control group pigs (by 29 %) (Kuzmenko O. et al., 2018.).

The research was conducted on the farm „Nadiia” in Cherkasy region on four groups of Large White young pigs during fattening, analogues by live weight, age and origin, 14 heads each. The initial live weight of young pigs of all groups was almost the same and amounted to 35.7; 35.2; 35.4; 35.2 kg. The first group was the control. After a 30-day equalization period, pigs from the 2nd and 3rd groups received Bio-Mos in the composition of the feed in the amount of 0.06% of feed weight, pigs from the 4th group received feed antibiotic Biovit in the amount of 10 g/head per day.

According to the experimental scheme, the animals from the control group received a diet adopted on the farm. It consists of, %: corn - 10, barley - 50, wheat - 20 and PMVS - 20. Bio-Mos was fed as part of the feed for young pigs from the 2nd group during 120 days, from the 3rd group during 90 days. Biovit was fed to animals from the 4th group during 90 days. The preparations were pre-mixed with PMVS. Pigs were kept in groups and weighed monthly. Compound feed was poured into the feed troughs 2 times a day and the account of the consumed feed was carried out daily.

Pigs from the 1st control group during the entire period of fattening had the average daily weight gain of 654 g, and pigs from the 2nd, 3rd and 4th experimental groups had 703 g, 692 g and 676 g, respectively. The largest average daily gains were observed in the 2nd experimental group of pigs which received Bio-Mos in the amount of 0.06% of feed weight, fed throughout the experiment. It should be noted that the difference in average daily gains in live weight between animals from the 2nd, 3rd and 4th experimental and control groups was reliable.

Live weight of one animal from the 2nd group at the end of the experiment exceeded the control by 6.8 kg, from the 3rd group - by 5.5 kg, and from the 4th - by 3.3 kg, i.e. by 5.7%, 4, 6% and 2.5%, respectively. Regarding the productivity of young pigs from the 2nd experimental group, it was the highest compared to animals from all experimental groups. With addition of 0.06% of Bio-Moss to the compound feed for pigs from the 2nd experimental group, the increase in live weight of pigs from this group at the end of the experiment was 127.6 kg (P pigs from the 2nd group increased their live weight by 105.5 kg, which is by 7.5 kg or 7.4% (P < 0.001) more than analogues of the control group).

The consumption of feed per 1 kg of live weight gain for young pigs from both control and experimental groups was 3.66-3.91 feed units for the entire period of the experiment, which can be explained by the high balance of diets for essential nutrients. It should be noted that the lowest cost of feed was observed in the 2nd experimental group of pigs. Per 1 kg of live weight gain, they spent only 3.66 feed units while in the 1st control group of animals these costs amounted to 3.91 feed units, which is by 6.4% more.

During the experimental period, animals from all groups showed similar rates of absolute and average daily gain. However, animals from the 2nd, 3rd and 4th experimental groups had slightly higher rates than animals from the 1st group. With age, the absolute and average daily gain increased, reaching a maximum at 3-4 months of experiment. In the 1st group of pigs the absolute gain in this period was 21.9-24.3 kg, the average daily gain was 728.6-809.5 g; in the 2nd group - 23.7-26.5 kg and 790.5-883.3 g, respectively; in the 3rd group - 23.7-26.4 kg and 790.5-880.9 g; in the 4th group - 22.9-25.4 kg and 761.9-847.6 g.





Animals from the 2nd, 3rd and 4th groups had rates higher by 4.6-9.1% throughout the experimental period than animals from the control group.

The intensity of animal growth can be observed by the relative growth rate both in individual periods and for the experimental period as a whole. At similar growth of pigs from the experimental groups, intensity of growth process of animals from the 2nd, 3rd and 4th groups was a little higher, than of analogues from the 1st group.

More equable growth intensity was in the 2nd and 3rd groups of animals, which consumed compound feed with Bio-Mos in the amount of 0.06% of feed weight. The relative growth rate when reaching a live weight of 120 kg was almost the same in the 1st control, 3rd and 4th experimental groups of animals - 22.0-22.1%. In the 2nd experimental group of animals, the relative growth rate at a live weight of 120 kg was the highest and amounted to 23.3%.

Regardless of feeding conditions, the relative growth rate with age decreased almost equally in the control and experimental groups of animals: in the 1st group from 57.3 to 22.1%, or by 35.2%; in the 2nd - from 59.3 to 23.3%, or by 36.0%; in the 3rd group - from 57.3 to 22.0%, or by 35.3% and in the 4th group - from 57.1 to 22.1 % or by 35%. This indicates that the level of feeding of experimental animals in terms of nutrient content was quite close. Animals from the 2nd experimental group, which consumed compound feed with Bio-Mos in the amount of 0.06% of feed weight during 120 days, were of interest.

The results of haematological studies showed that the biochemical and morphological parameters of the blood of all experimental animals corresponded to the physiological norm. The haemoglobin content varied similarly to the erythrocyte content. In the 1st and 4th groups of animals the haemoglobin content was almost similar - 111.50 and 111.77 g/l. In the 2nd group its content was higher by 3.27 g/l ($P > 0.05$) than in the 1st group. Although the haemoglobin content corresponded to the physiological norm in all experimental groups of animals, its highest content was observed in the 2nd group of animals. This makes it possible to say that animals from this group had more intense metabolic processes, which helps to increase productivity.

The content of erythrocytes in the 1st, 2nd, 3rd and 4th groups of animals was close and was within the physiological norm. In the 2nd group of animals the content of erythrocytes was 7.71 T/l, which is more by 4.76% ($P > 0.05$) than in analogues from the control group. The leukocyte content was highest in the 2nd experimental group of pigs. According to this indicator, 3.05% of pigs from the 2nd group exceeded control animals, but this difference was not significant.

There was no significant difference in the content of protein, albumin and globulin between the animals from the control and experimental groups, because animals almost did not differ from each other by these indicators. Data on the content of protein and its fractions indicate that the level of protein nutrition in the control and experimental groups was sufficient, and the resistance of pigs was highest in the 2nd experimental group. This is due to the content of γ -globulins.

The value of reserve alkalinity in the blood of piglets from the 2nd experimental group with consumption the prebiotic Bio-Mos during 120 days of the experimental period was lower by 2.2 mmol/l ($P > 0.05$), compared with animals from the control group. It should be noted that the content of glucose in the serum was also highest in the 2nd experimental group of pigs and amounted 3.43 mmol/l.

Determination of the content of calcium and phosphorus in the blood serum showed that their content was sufficient in all groups of animals: calcium - 2.85-2.97 mmol/l and inorganic phosphorus - 2.02-2.05 mmol/l. The calcium content in the serum of pigs from the 2nd group was higher by 0.11 mmol/l than in the 1st group of animals. However, no significant difference between the animals from the control and experimental groups in terms of calcium and phosphorus content was found. Since minerals enter the body with food, the data on their content in the serum indicate that there were enough of them in the diets of animals in both control and experimental groups.





Thus, studies show that compound feeds enriched with Bio-Mos had a positive effect on blood parameters and productivity of pigs when raised for meat. The high efficiency of the use of prebiotic Bio-Mos indicates the inexpediency of using antibiotics, in particular Biovit, in feeding young pigs during fattening.

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