

The effect of probiotics on the Californian rabbits' productivity

N.A. Cheremenina, S.A. Veremeeva*, E.P. Krasnolobova and S.V. Kozlova

Federal State Budgetary Educational Institution of Higher Education "Northern Trans-Ural State Agricultural University", 7 Republic st., Tyumen, 625003, Russia

Abstract. Against the background of an increase in allergic diseases in humans, the issue of safety and bioavailability of meat products is very relevant today. The diversity of the biochemical composition of rabbit meat and the high percentage of its nutrients' digestibility by the human body determines the value of rabbit meat. In this regard, the study of the issues of increasing the rabbits' productivity is relevant. The aim of the work was to study the effect of the Bio-Mos probiotic on the productivity of Californian rabbits. The study was conducted on the basis of the FSBEI HE SAU of the Northern Trans-Urals and on the basis of the rabbit breeding complex of CJSC APPK "Roshchinsky" of the Tyumen region. The object was male rabbits at the age of 4 months. 2 groups were formed: control (regular diet), experimental (regular diet + Bio-Mos probiotic at a dose of 2 g per kg of granulated feed). Further, the stomach contents of rabbits were evaluated; biochemical analysis of muscle tissue samples, slaughter yield, organoleptic and microbiological indicators of meat were carried out. The studies revealed a positive effect on the digestibility of nutrients (fiber, copper, and zinc), as well as on the slaughter yield (an increase of 2.5%), an increase in the amount of protein (18.30 ± 0.19 g/100g), fat (8.5 ± 0.64 g/100g) and the energy value of meat (647.90 ± 6.59 kJ/100 g). All this indicates an increase in productivity against the background of introducing Bio-Mos into the diet due to stabilization of the digestive system.

1 Introduction

Food allergies in humans and animals are becoming more widespread every year. According to WHO, manifestations of food allergies occur in average of 2.5% of the population. The problem is most relevant in infancy and early childhood: 17.3% of children have a history of food allergy symptoms. The frequency of food allergies exceeds 30% among children suffering from atopic dermatitis [11]. In most cases, people suffering from this disease have allergic reactions caused by such common types of protein as chicken, beef, and pork. Therefore, it is vital to look for alternative sources of protein. In turn, rabbit meat is suitable for most patients suffering from food allergies. Therefore, the study of increasing rabbits' productivity without the use of growth stimulants and antibiotics is very relevant.

* Corresponding author: veremevasa@gausz.ru

Many researchers are studying the effect of probiotics on the productive qualities of rabbits [5,7,12,13]. Bio-Mos probiotic is used in animal husbandry and poultry farming [1,2,4,6,8,9]. Bio-Mos is a derivative of processing a special strain of *Saccharomyces cerevisiae* yeast using a special technology patented by Alltech. This probiotic has a positive effect on the immune status of animals, normalizes the microflora, as well as improves the marketable qualities of meat, eggs, and milk.

2 Materials and methods

The purpose of the research work was to study the effect of the Bio-Mos probiotic on the productivity of Californian rabbits.

The research work was carried out in the FSBEI HE SAU of the Northern Trans-Urals and on the basis of the rabbit breeding complex of CJSC APPK "Roshchinsky" of the Tyumen region. The object of study was male rabbits of 4 months of age. In the experimental group, the Bio-Mos probiotic was added to the basic diet at a dose of 2 g per kg of granulated compound feed from the age of 2 months.

The contents of the rabbit stomachs were studied; biochemical analysis of muscle tissue samples was carried out, which were taken when dressing the carcasses of experimental and control groups on the basis of the State Station of the Agrochemical Service "Tyumen" using the "Feed Analysis Manual" and the corresponding GOST standards. Rabbit carcasses were weighed using VLKT-500 scales (GOST 241-04-08) with an accuracy of 0.01 g. The slaughter yield was calculated as a percentage of the slaughter mass to the mass before slaughter. Organoleptic and microbiological studies were also carried out according to generally accepted methods [3]. The established numerical data were subjected to variable statistical processing by Student's t-test using Excel 2010.

3 Results

When studying the chemical composition of the stomach contents (Figure 1), it was found that fiber is broken down 7.5% more actively under the influence of Bio-Mos in the experimental group. Trace elements play an important role in the formation of muscle mass and the nutritional value of meat [10]. Rabbits of the experimental group have a more active absorption of trace elements such as copper (2.5 times) and zinc (1.8 times). All this indicates a better digestibility of nutrients, which has a positive effect on productive qualities.

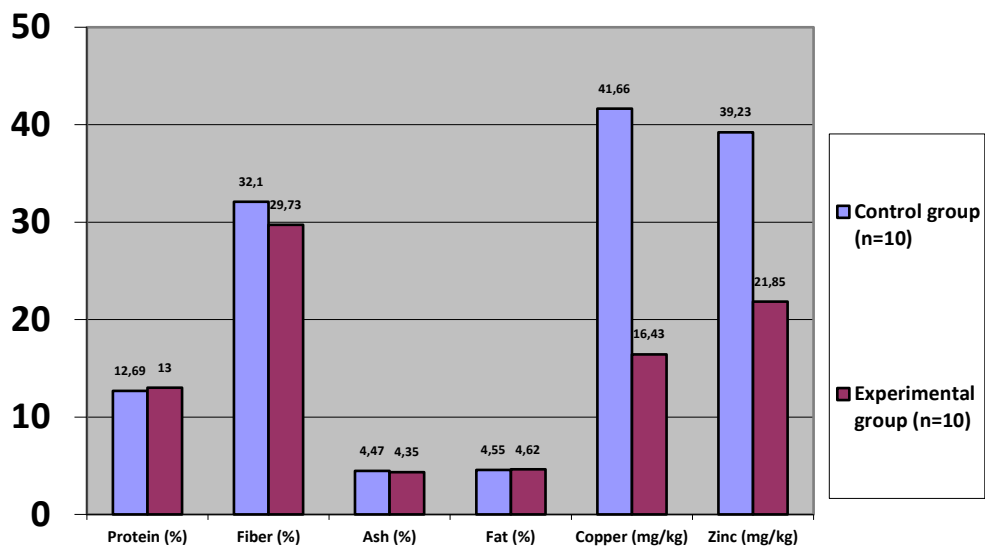


Fig. 1. Chemical composition of the stomach contents of Californian rabbits.

One of the important qualities of productivity is the slaughter yield. In these studies, it was noted that it was 2.5% higher in the experimental group ($54.1\pm0.1\%$) than in the control group ($52.6\pm 0.19\%$).

No deviations were detected during organoleptic and microbiological studies of rabbit meat in the experimental and control groups. When studying the chemical properties of meat (Figure 2), it was noticed that there was a decrease in water by 2.4 g; protein increased by 0.9 g and fat - by 0.4 g.

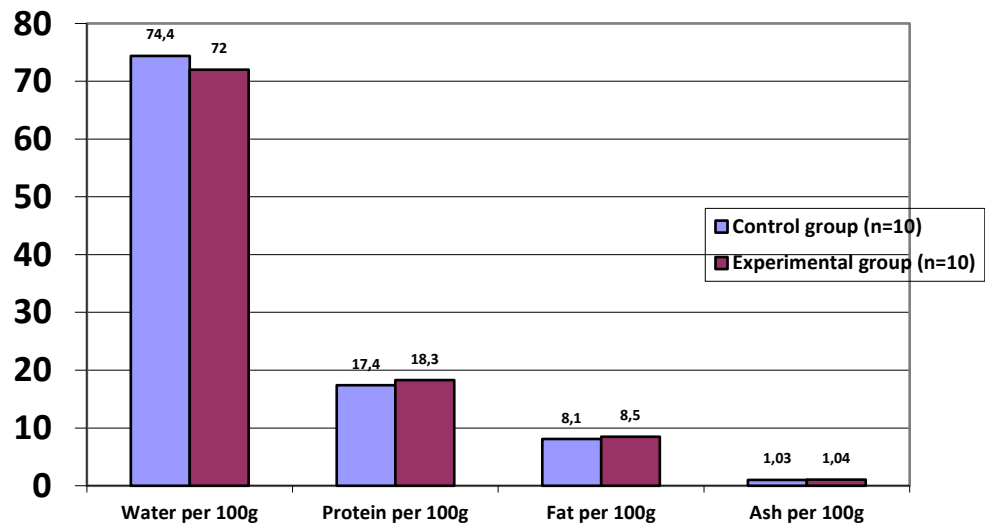


Fig. 2. Chemical composition of rabbit meat of experimental and control groups.

It was also identified that the energy value of rabbit meat in the experimental group (647.90 ± 6.59 kJ/100g) was 50.2 kJ/100g higher than in the control group (597.70 ± 3.99 kJ/100g).

4 Discussion

In their work, Kurchaeva, E. E., Vostroilov, A. V., Vysotskaya, E. A., Artemov, E. S., Maksimov, I. V. (2020) note a positive effect on the growth intensity, as well as an increase in the protein amount in the muscles of rabbits when using a probiotic based on a bacteria consortium of the *Bacillus* genus. According to Lasenko M.V. (2021) Barymova O.P., Glebova I.V., Barymov A.A. (2020) Gagloev A.Ch., Engovatov V.F., Frolov A.I. (2018), a significant increase in the animal productivity (calves, pigs) treated with Bio-Mos, an increase in the safety of livestock during the growth period, as well as reducing feed costs at the time of the increase in live weight of young animals were established. The analyzed published data are consistent with the results of this research on the effect of the Bio-Mos probiotic on the productive qualities of Californian rabbits.

5 Conclusion

In conclusion, it can be noted that the Bio-Mos probiotic has a positive effect on the productive qualities of Californian rabbits; in particular, it increases the slaughter yield, protein and fat content in muscles.

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