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Characterization of Rabbit Meat Productivity in Applying Mineral Additive

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Abstract: Natural food which make up the diet of farm animals does not always contain all the necessary substances. It is often quite difficult to replace one food with another in order to make good the deficit. One of the most important factors of efficiency of feeding as well as increasing the productivity of animals is the introduction of various supplements and preparations into their diet. Mineral supplements are given to animals to maintain normal life, form of bone and other tissues, stimulate metabolism and energy. Animals are more susceptible to diseases, give smaller amounts of milk and meat, reproduce worse with a lack of substances such as calcium, phosphorus, sodium and iron. Thanks to mineral supplements animals are maintained in a healthy state, normally reproduce and growing stock properly developed. In our research we studied the effect of the new mineral feed supplement "Tseostimul" on the quality of rabbit meat of the "*Soviet chinchilla*" breed. The studies were conducted on the basis of Miacro-Karatau farm on 100 animals. The first group was a control and received the main diet. In addition to the main ration, the drug "Tseostimul" was added to the second group in a dose of 1% by weight of the compound feed, to the third group -3% and the fourth group -5% by weight of the compound feed. The research showed that rabbit meat in terms of organoleptic and physico-chemical parameters comply with the requirements of GOST for fresh, benign meat.

Key words: Rabbits, sorbents, live weight, meat quality, productivity, organoleptic

INTRODUCTION

Today there is a tendency to increase the production of rabbit meat due to its dietary qualities compared to meat of other types of domestic animals. Rabbit meat is highly digestible, contains the least amount of cholesterin and it is fibrillate (Khristoforovich *et al*., 2016; Smolentsev *et al*., 2018).

Today, the use of various feed additives in the diet which contribute to increasing animal productivity and obtaining environmentally safe and bio-rich products is becoming relevant in the production of livestock products, including rabbit breeding (Semenov *et al*., 2018). This is especially, important in conditions of environmental pollution with waste from industrial enterprises which cause the accumulation in feed and feed additives of heavy metals, residues of pesticides, herbicides and other toxicants (Ilyasovich *et al*., 2016; Egorov *et al*., 2018). In this regard, the use of natural sorbents in feeding rabbits is relevant and is of scientific interest (Matveeva *et al*., 2015; Dmitriyevich *et al*., 2016). Due to physical and mechanical properties and chemical composition, these substances have unique ion-exchange and adsorption properties, participate in various metabolic processes and carry out correction of homeostasis of animals, allow to produce environmentally friendly food (Tsaregorodtseva *et al*., 2019). By the present moment the efficiency of the use of zeolite-containing rocks and bentonite clays in the diet of cattle, pigs, birds is proved. However, the use of natural adsorbents in rabbit breeding has not been studied enough (Kabanova *et al*., 2016; Valiullin *et al*., 2017; Samsonov *et al*., 2018).

Such additives include "Tseostimul" a mineral supplement based on sorbents of Hotynetskogo field, the Oryol region. The combined medication has sorption, molecular sieve, ion-exchange and catalytic properties.

The purpose of this research is to study the effect of the mineral additive "Tseostimul" on the productivity and quality of rabbit meat.

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Table 1: Experience diagram

Groups	No. of heads	Feeding conditions
1st control	25	Economic diet (IR)
2nd experimental	25	IR+ "Tseostimul" (1% by weight of feed)
3rd experimental	25	IR+ "Tseostimul" (3% by weight of feed)
4th experimental	25	IR+ "Tseostimul" (5% by weight of feed)

MATERIALS AND METHODS

The study was conducted on the basis of the farm "Miakro-Karatau". The object of the study was rabbits of the "*Soviet chinchilla*" breed at the age of 50 days. During the experiment, a combined type of feeding with granulated food and hay was used. Animals had unlimited access to water. The rabbits maintenance and feeding was conducted in accordance with the zoohygienic and zootechnical norms.

For research 100 animals were divided into 4 experimental groups of 25 each. The first group was a control and received the main diet, consisting of PZK-90-1 feed and mixed herbs hay. The drug "Tseostimul" was added in a dose of 1% by weight of the compound feed, for the third group -3% and the fourth group -5% by weight of the compound feed (Table 1) to the main ration of rabbits.

The experienced rabbits weighing was performed every 10 days in the morning before feeding to study the growth and development dynamics. According to the weighing data, the absolute and average daily live weight gain was calculated.

When the age of 120 days was reached, a control slaughter of 3 heads from each group was carried out to assess the meat quality of rabbits. After the meat aging its organoleptic properties were studied, a commission tasting of meat and broth was carried out.

The quality of the meat was determined in accordance with the requirements of GOST. Protein, fat, water and mineral substance were also determined to assess the quality of meat.

RESULTS AND DISCUSSION

During the experiment, the animals ate well feed, the residues were not observed. At the same time, the studied drug had a positive effect on the growth and development of animals.

Throughout the experiment, the highest live weight values were observed in rabbits of the 3rd experimental group who received compound feed with the addition of the drug Tseostimul at a concentration of 3% by weight of the feed. At the beginning of the experiment, the live weight of the rabbits was at the level of 1032.8-1039.4 g. On the 10th day of the experiment the live weight of animals in the control group was 1213.0. The largest live weight was observed in the third experimental group -1294.0 g. In the second and fourth groups live weight was at the level of 1266.0 and 1224.0 g, respectively. On the 30th day of the experiments, animals from the 3rd experimental group had a live weight of an average of 1795.0 g while animals from the control, 2nd (1%) and 4th (5%) groups had live weights in an average of 1597.2, 1671.0 and 1719.0 g, respectively. At the age of 100 days, rabbits of the 3rd experimental group weighed an average of 2318.4 g and control, 2nd and 4th groups -2119.6, 2240.6 and 2315.8 g, respectively. At the end of the experiment at 120 days of age, the rabbits of the 3rd experimental group also had the largest live weight -3481.0 g.

At 120 days of age, the animals that received the experimental diet with the test drug had a greater absolute increase in live weight compared with the control group (2169.4 g). The rabbits of the 3rd experimental group had an absolute increase in live weight, it amounted to 2444.4 g (Tseostimul 3%) and animals of the 2nd and 4th groups had a result of 2347.4 and 2371.6 g, respectively. The slaughter mass of the 3rd experimental group rabbits was 12.3% more than in the control group in the 2nd and 4th experimental groups by 8.7 and 4.9%, respectively.

The chemical analysis of meat showed that the protein content in the experimental groups increased. The fat content decreased in groups 2 and 4. Compared with the control group, the moisture content increased in the 4th experimental group. When the "Tseostimul" supplement was added to the ration, the calcium content in all experimental groups increased and there were no statistically significant changes in the phosphorus content among the experimental groups.

The organoleptic assessment showed that the studied rabbit carcasses corresponded requirements of standards. The crust of drying on the carcass surface had a pale pink color. The serous membranes were moist and shiny, the muscles on the incision were slightly moist. The integumentary and internal fatty tissues were yellowish-white. The muscles had a dense, elastic consistency. The smell is specific, peculiar to fresh meat. Consequently, the inclusion in the rabbits diet "Tseostimul" did not have any negative influence on organoleptic characteristics of meat.

The tasting commission in evaluating the meat and broth of the studied rabbits carcass did not reveal the negative effect of the studied drug on the organoleptic properties. At the same time, appearance, color, smell, taste, richness, juiciness were evaluated. On a 5-point scale, meat in the control group received an average of 4.2 points and samples of meat from the 2nd, 3rd and 4th groups received 4.0; 4.5 and 4.2 points, respectively. The 3rd experimental group also received the highest average score in broth (4.5 points) which is on average 1.3 points more than in the control group.

CONCLUSION

The inclusion of the studied supplements in the rabbits diet did not have a negative impact on the safety and physiological state of rabbits. Rabbits of the experimental groups had the best indicators of weight gain compared with the animals of the control group. The absolute increase in live weight at the end of the experiment was more than the benchmarks by 8.2-12.7%. Organoleptic characteristics of carcasses obtained from experimental animals complied with the requirements of GOST. The tasting evaluation showed that the study drug did not adversely affect the organoleptic properties of meat and broth.

REFERENCES

Dmitriyevich, C.E., O.A. Vladimirovich, R.A. Leonidovich, H.L. Valeryevna and N.C. Sergeevna *et al*., 2016. The Russian heavy draft milk type mares characteristics. Res. J. Pharm. Biol. Chem. Sci., 7: 1930-1933.

Egorov, V.I., S.Y. Smolentsev, L.R. Valiullin, V.V. Biryulya and A.A. Nabatov *et al*., 2018. Toxicity indices of uracil derivatives on lung epithelial cells. Indian Vet. J., 95: 33-36.

Ilyasovich, S.E., T.A. Mikhailovna, S.V. Rasimovich, S.S. Yurievich, S.F. Akhmadullovich, P.K. Khristoforovich and T.M. Yakovlevich, 2016. Efficiency of application of a polysaccharide enterosorbent of Fitosorb for prevention of the combined mycotoxicosis. Res. J. Pharm. Biol. Chem. Sci., 7: 2229-2237.

Kabanova, T.V., S.Y. Smolentsev, E.A. Savinkova, E.V. Tsaregorodtseva and E.G. Shuvalova *et al*., 2016. Development of technology lamb boiled in the skin with the use of milk-protein complex. Res. J. Pharm. Biol. Chem. Sci., 7: 839-846.

Khristoforovich, P.K., K.I. Ravilevich, S.V. Rasimovich, T.M. Yakovlevich and T.A. Mikhailovna *et al*., 2016. Cytomorphological changes hepatorenal system combined with fever poisoning xenobiotics. Res. J. Pharm. Biol. Chem. Sci., 7: 2214-2221.

Matveeva, E.L., V.P. Korosteleva, E.K. Papynidi, G.R. Yusupova and S.Y. Smolentsev, 2015. Electron microscopic evaluation of the impact on microorganisms of quaternary ammonium compounds. Res. J. Pharm. Biol. Chem. Sci., 6: 207-209.

Samsonov, A.I., E.I. Semenov, E.M. Plotnikova, S.Y. Smolentsev, A.I. Nikitin, K.K. Papunidi and M.Y. Tremasov, 2018. Mink farming and my cotoxicosis. Indian Vet. J., 95: 52-55.

Semenov, E.I., N.N. Mishina, S.A. Tanaseva, I.R. Kadikov and A.M. Tremasova *et al*., 2018. Systemic anaphylaxis due to combined mycotoxicosis in Wister rats. Indian Vet. J., 95: 16-19.

Smolentsev, S.Y., E.N. Poltaev, L.E. Matrosova, E.L. Matveeva and A.E. Ivanova *et al*., 2018. Stimulation of Rumen Microflora in cattle by using Probiotic concentrate. Res. J. Pharm. Biol. Chem. Sci., 9: 948-950.

Tsaregorodtseva, E.V., S.Y. Smolentsev, T.V. Kabanova, S.I. Okhotnikov and E.G. Shuvalova *et al*., 2019. Sheep breeding for dairy herd, composition and technological properties of raw milk. Res. J. Pharm. Biol. Chem. Sci., 10: 1772-1780.

Valiullin, L.R., I.I. Idiyatov, V.I. Egorov, V.R. Saitov and K.K. Papunidi *et al*., 2017. A study into the safety of novel bioresorbable matrices for repairing bone tissue defects. Bali Med. J., 6: 327-330.