Effects of Beta-Glucan on Performance of Broiler Rabbits

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Abstract
An experiment was conducted in order to evaluate the effects of beta glucan on selected breeding properties of broiler rabbits. The goal was to compare the results in two groups of animals, which were administered different beta glucan doses, during a period of time between weaning (day 42 after the birth) and day 84 after the birth. Control group K was administered per oral suspension of Sulfacox, preparation against coccidiosis. Experimental group E1 was served a per oral water suspension of beta glucan powder, in concentration 5 g/L for every 5 kg of body weight. Experimental group E2 was served a per oral water suspension of beta glucan powder, in concentration 10 g/L for every 5 kg of body weight. At day 84 after the birth, control group C average body weight was 2515.75g, compared to 2459.88g in group E1 and 2455.77g in group E2. Two mortalities were noted in control group C between day 49 and 63, compared to two mortalities in group E1 and one mortality in group E2 during the same period of time. In all cases, coccidiosis was the reason for mortalities. In all animals, no statistically significant differences in selected breeding properties were observed.

Keywords: beta glucan health, production parameters, rabbit, rabbit-breeding coccidiosis.

1. Introduction

European Commission Regulation from 2003 allows for animal nutrition use only permitted additives. On the basis of new scientific evidence, some additives classified as dangerous for animals to humans or the environment and subsequently banned. Such forms were banned feeding antibiotics, certain coccidiostats and growth promoters. [1] describes a variety of feed supplements as a substitute for antibiotics.
[2] compared the natural product Emanox with commercialized coccidiostats - widely used chemical preparation Sulfacox. The experiment was aimed to compare the effects of these feed additives for the production of selected indicators. The results of the study showed that the preparation Emanox purely natural basis is a good alternative chemical species coccidiostats.

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The experiment with broiler rabbits was to reduce coccidia oocysts selected vegetable additive Eleutherococus senticosus, oregano, sage and chemical preparation Xtract. In all test groups was observed in the 21 days the experiment reduced the number of oocysts. The difference between the group of Xtract and Eleuteococ was statistically significant [3].
In the 90s of last century began in Norway with the addition of beta-glucan in compound feed for industrially farmed salmon. Pure natural beta-glucan replaced the previously commonly used antibiotics. The beneficial effect of beta-glucan and zero toxicity even in the smallest marine fish embryos have been proven in numerous professional documents. Subsequently, also it showed higher autarcesis. The effect of beta-glucan was also reflected in better recovery of fish after exposure to toxins in contaminated water.
However, information about the effect of β-glucans on gut barrier and intestinal microbiota in weaned rabbits is scarce [4].

The aim of this work was to evaluate the effect of adding a polysaccharide beta-glucan in rabbit nutrition and to compare its impact on selected indicators of production with conventional chemical coccidiostats.

2. Materials and methods

In the experiment have been utilized 94 rabbits (Hycole), which were divided into three groups (two experimental groups (E1; E2) and one control (C).

Group E1 – by day 21 post partum were rabbits in water dosed beta-glucan with concentration of 5g/l of water.

Group E2 – by day 21 post partum were rabbits in water dosed beta-glucan with concentration of 10g/l of water.

Group C – by day 21 post partum was given to rabbits in water chemical coccidiostat - commercial preparation sulfacox.

Feeding was provided ad libitum.

In all groups (E1; E2; C) received the preparation was given mother rabbits, too. Weaning was carried out in all groups aged 42 days post partum. Rabbits after weaning were placed in fattening cages for two. Nutrition ensure complete feed mixtures (16% NL, 16% fibber). Rabbits had permanent access to quality lucerne hay.

Photoperiodic regime was modified such that the photoperiod was 15 hours, the length of the dark part of the day was 9 hours. The ambient temperature was 5-14 ° C.

We observed body weight individually measured once a week from 42 to 84 day), the health status of rabbits - incidence of respiratory diseases, coccidiosis, conditional status and mortality from 42 to 84 day.

3. Results and discussion

The conclusion of the experiment show that the effect of beta-glucan administered in drinking water is comparable to the commercial preparation Sulfacox, used as a coccidiostat in the small and intensive breeding of rabbits.

Comparing the observed production of results between treatment groups and control group has only minor variations, no statistically significant differences between groups ($p > 0.05$).

Table 1. Overview of the parameters of growth in the groups studied

Group	Weight in grams					
	C		E1		E2	
Age in days	n	x	n	x	n	x
42	32	1065.82±104.78	31	1072.00±100.59	31	1077.21±98.51
49	31	1177.4±202.35	30	1193.35±122.48	31	1195.36±118.12
56	30	1488.57±206.02	29	1487.06±170.61	30	1529.85±148.21
63	30	1724.00±152.39	27	1708.63±121.60	30	1693.69±204.32
70	30	1975.64±150.29	27	2101.50±127.10	30	2238.54±271.28
77	30	2322.79±186.24	27	2375.00±240.72	30	2405.85±296.21
84	30	2515.79±220.14	27	2459.86±253.24	30	2455.77±327.01

In the control group C was recorded two cases death of rabbits. The cause of death was coccidiosis, which was confirmed on the basis of typical pathological changes characteristic of coccidia - gnashing of teeth, in swollen, constipation, diarrhea. In the control group, we have not seen during the reporting period, a further deterioration in the health status of fattening rabbits. Mortality was recorded in the 47 day and 55 day.

In the experimental group E1, we recorded the death of two rabbits. Causes of mortality were also alimentary disorders due to coccidiosis. Within the group, we recorded two cases of ill-health, where the cause of health status was also coccidiosis, these rabbits were recovered, but they started to achieve lower gains. Deaths were recorded in the 45th and 61st day of life rabbits. Ill health was recorded at the 51 and 58 day.

Under the monitoring group E2 was recorded one case of death, which was caused by alimentary disorders caused by coccidiosis rabbits. Mortality was recorded at age 53 days. [4] showed β-glucans changed intestinal microbiota and modulated the immune response by reducing the expression of some pro-inflammatory cytokines in ileum and caecum of weaned rabbits.

Mannanoligosaccharides (MOS) and β-glucans extracted from Saccharomyces cerevisiae are promising alternatives to antibiotic growth

promoters [5,6] . They have shown beneficial effects on mucosal integrity and are capable of modulating the immune response and intestinal microbiota in chicken and pigs [5-7]. In rabbits, recent publications suggest that these prebiotics increase villus length [8] and reduce coliforms count in the caecum [6] observed that β-glucans improved maternal humoral immunity at late lactation by elevating serum Ig concentrations in does.

4. Conclusions

In this work, we did not record statistically significant differences in the intensity of growth between experimental groups (E1, E2) and control group (C). The positive is that in the experimental groups (E1, E2) has not been observed increased mortality compared to the control group (C), which was used chemical coccidiostat for the purpose of damping coccidiosis of rabbits. Another study into the effects of beta-glucan for controlling coccidiosis is even more necessary.

Acknowledgements

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