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STUDIES REGARDING THE EFFECTS OF SOME HYDROALCOHOLIC EXTRACTS FROM AROMATIC PLANTS UPON THE GROWTH PERFORMANCES OF BROILER HENS

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Abstract

The following study shows the results obtained after the administration of two aromatic plants at broiler hens. 90 broiler hens, from hibrid Ross-308 were taken under observation during the experiment and the experimental period was from 1 to 42 days. The followed issues during the experiment were the evolution of the medium body weight gain, the daily live weight gain, tha daily feed intake and the feed conversion efficiency.

Key words: aromatic plants, broiler hens, growth performances.

INTRODUCTION

In the UE starting from January the First, 2006, the antibiotics used as growth promoters, were taken out from the animals nutrition. That is why it is necessary the development of some alternative strategies for the improvement of the health and productivity at animals, without causing a significant growth on the production costs.

Most of the researches were axed on the idea of changing the antibiotics with other growth promoters. In order to keep the level of animal production the present documentation took in regard series of substances, some of them new, and even already known ones. Researches showed that pre- and probiotics, simbiotics, organic acids, different enzymatic preparates, and also diffrent extracts (aqueous, hydroalcoholic, oils, essential oils) from medicinal and aromatic plants, wich are called phytoadditives, can be considered potential promoters (Tossenberger, Babinszky and Kovács, 2002).

Although all this substances are beeing already used in human medicine, our knowledge about them is, not enough, yet. The mechanism of reaction for the active substances and plants are undiscovered, and needer their effect upon animal organism are enough clearly specified. Most of the substances from plant extracts presents multifunctional effects. The literature of speciality reminds more often antioxidant, apetisant, imunostimulant, bacteriostatic properties (Erdélyi, 2004).

The objective of the current study was to determine the effects of thyme and rosemary upon the bioproductive performances at the broiler hens.

MATERIAL AND METHODS

In the following experiment there had been used 90 broiler hens, which were taken under observation at the age of one day, belonging to hybrid Ross-308 and they were divided into three experimental group, 30 birds/group. All the three trial took advantage of the some type of nutrition, but at trials L2, L3 were administrated in the drinking water also a phytoadditive, so: L2 – hydroalcoholic extract of Thyme (EHCi, 1 % in the drinking water), L3 – hydroalcoholic extract of Rosemary (EHR, 1 % in the drinking water).

The adopted technology was that of raising broiler hens at land. The housing was made in separate compartiments on trials, having a range of 12 birds/m^2, but in the same cottage, taking advantage in this way by the same climate and growth technology.

The lightening methods were in this order: 23 hours of light and one hour of dark.

The experimental period was 42 days, beeing divided, in three periode like wise: starter (14 days): 1- 14 days ; grower (21 days); 15- 35 days; finisher (7 days): 36 – 42 day.

During the experiment were used combined nutritions matching for each moment, periode of growth. N.C. starter with a CP of 21% and ME 2990 Kcal/Kg N.C., grower with a CP 19% and ME 3100 Kcal/Kg, N.C. finisher with a CP of 18% and ME 3150 Kcal/Kg.

RESULTS AND DISCUSSION

Evolution of body weight gain at the broiler hens for the all experimental groups

In table 1. are given the medium body weight gain in dinamic fase. Although at the age of one day, the medium body weight gain of broiler hens had similar values for the three trials, during the experiment the body weight gain had a different evolution so that at the end of the first fase, the broilers from L2 wich got EHCi, had made themselves remarked.

In this way, comparing to those from L1 (M), the body weight gain at the age of 14 days was higher at those from L2 with 16.12 g/bird; at those from L3 with 8.66 g/bird. In the other two fases (grower and finisher) the broiler hens had achieved increas at the body weight gain, and by getting elder, they got different values depending from the phytoadditives used in their nutrition. At the end of the grower period, at the age of 35 days, the

body weight gain of broiler hens was of 1932.85 g/bird in case of L1 (M); 1913.12 g/bird in case of L2 (with EHCi) and 2030.66 g/bird in case of L3 (with EHR).

Compared to L1 which didn't take bennefit of any phytoadditives, the body weight gain at the broiler hens from L2 was lower with 19.73 g/bird, and at L3 higher with 97.81 g/bird.

In the finisher fase the body weight gain are in advantage still for L3, which at the end of the experimental period, compared to the broiler hens from L1 (Control group) had achieved a higher body weight gain with 3.4 %. In case of L2 (EHCi) it can be noticed a difference of 1.17 % less than L1.

Table 1.

Evolution of body weight gain and standard deviation ($\pm s_x$) of broiler hens during the experiment.

Specification	L1 Body weight gain $\pm s_x$	L2 Body weight gain $\pm s_x$	L3 Body weight gain $\pm s_x$
Initial	40.20 ± 0.20	40.50 ± 0.21**	40.10 ± 0.20
Fase I	378.21 ± 22.38	394.33 ± 24.16	386.87 ± 24.57
Fase II	1932.85 ± 64.32	1913.12 ± 66.05	2030.66 ± 61.40**
Fase III	2551.76 ± 78.67	2521.83 ± 75.41	2638.41 ± 74.16**

*p<0,05; ** p< 0,01; *** p<0,001

The obtained results were analised also statistically with the add of some parametrical tests (test t and ANOVA) and some nonparametrical tests (Mann-Withney and Kruskal Wallis). Regarding the evolution of medium body weight gain, there are significant differences of statistic point of view towards L1 (Control group) which had been registered at L3 in the second and in the third fase of nutrition, where p<0,01.

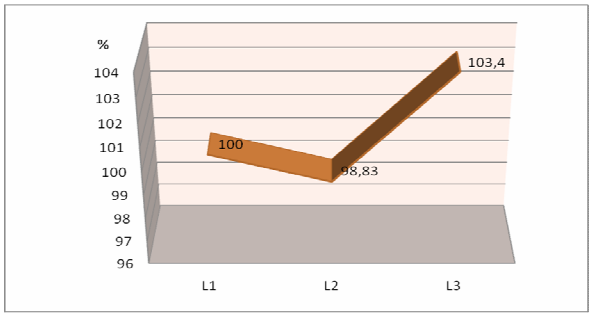

Fig. 1. Graphical representation of percentage values of body weight gain at broiler hens at the age of 42 days.

Analising the standard deviation in the case of each trial, it can be said that at the end of the experimental period, those two trials which got phytoadditives registered standard deviation values, lower from L1 (Control group). In this manner L1 accomplishes a value of 78.67 g/bird, the broilers from L2 (which got EHCi) 75.41 g/bird, and L3 (which got EHR) 74.16 g/bird.

The daily live weight gain

The daily live weight gain registered was similar in the first experimental period for the three trials. Significant differences appeared at the end of fase II, when L3 achieved a daily live weight gain higher with 5.73 % than L1 (M). In the same time L2 achieves a daily live weight gain lower with 2.36 % than L1. Estimated for the entire experimental cycle the values are close and the order is the following: the best daily live weight gain is registered by L3, followed by L1, than L2. The values are beeing showed in the table 2.

Table 2.

The daily live weight gain (g/bird/day) at the three trials.

Specification	L1	L2	L3
Fase I	24.14	25.27	24.77
Fase II	74.03	72.32	78.27
Fase III	88.42	86.96	86.82
Whole cycle (1– 42 day)	59.80	59.08	61.86

The daily feed intake

Regarding the daily feed intake at the three experimental trials, by the end of the starter period, the registered values were close one to another, beeing between: 40.38 g/bird (L3) and 41.52 g/bird (L1 – control group). In the second period (grower fase) of increase the lower daily feed intake was achieved by L2 (140.31 g/bird). At the end of the third period of nutrition were registered significant differences at L3 towards L1, at which the daily

feed intake was lower with 15.56 g/bird than L1. The values are showed in table 3.

Table 3.

The daily feed intake (g feed/bird/day) at the three experimental groups.

Specification	L1	L2	L3
Fase I	41.52	40.94	40.38
Fase II	146.58	140.31	149.50
Fase III	188.33	180.01	172.77
Whole cycle (1– 42 day)	117.21	113.43	116.30

Feed conversion efficiency

The feed conversion efficiency values reached are beeing shown in table 4.

Table 4.

Feed conversion efficiency at the three trials.

Specification	L1	L2	L3
Fase I	1.72	1.62	1.63
Fase II	1.98	1.94	1.91
Fase III	2.13	2.07	1.99
Whole cycle (1– 42 day)	1.96	1.92	1.88

Upon the values from fig. 2. it can be said that the feed conversion efficiency was lower than L1 (M) with 4.08 % at L3 and with 2.04 % at L2.

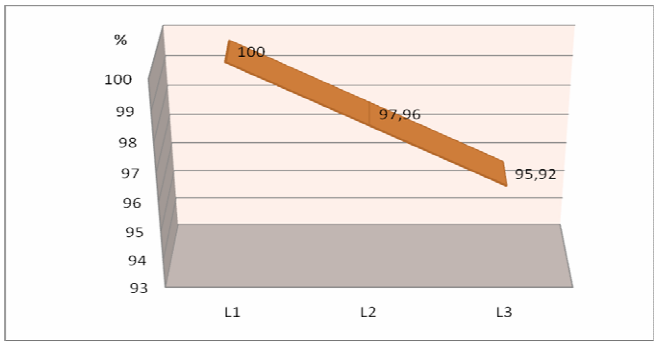

Fig. 2. Feed conversion efficiency at the three trials in percentage represent during the whole experimental period.

CONCLUSIONS

At the end of the experiment (at the age of 42 days), the body weight gain of broiler hens, reached medium values of 2551.76 g/bird at L1

(Control group), 2521.83 g/bird for trial L2, 2638.41 g/bird at L3. The body weight gain differences are in advantage in this case of broiler hens from L3, those whom got hydroalcoholic extract of rosemary.

Regarding the standard deviation the obtain values shows that L3 presents the higher omogenity of 74.14 g, followed by L2 with 75.41 g, and L1 with 78.67 g.

The lowest daily feed intake estimated for the entire experimental cycle, had been registered at L2 beeing 113.43 g/feed/bird/day, followed by L3 with 116.30 g/feed/bird/day and by L1 with 117.21 g/feed/bird/day.

Represented procentual the feed conversion efficiency was lower than L1 with 4.08 % at L3 and with 2.04 % at L2, fact that shows that the level of 1 % EHR and 1 % EHCi administrated in the drinking water as growth biostimulator, induce to the improvement of the growth performances and a higher feed conversion.

The results obtained after the use of phytoadditives as growth biostimulators are similar to those results obtained by other scientists.

Ocak at al. (2008) had studied the productive performances at broiler hens after the administration of Mentha piperita (as powder) and Thymus vulgaris (as powder). After the experiments made they concluded that needer Mentha nor Thyme does not produce positive or negative effects upon the growth performances at broiler hens, but Mentha piperita can be a growth promoter in the first period of increase.

The values from the doctrine, regarding the use of Rosemary as growth promoter are incomplete and contrary.

Al-Kassie (2008) had obtained positive results by the administration of Anise and Rosemary in a concentration of 0.5 – 1 % in the feed of broiler hens. The highest daily feed intake had presented the trial with anise 1 %, followed by the trial of anise 0.5 %, the Rosemary trial of 1 %, the Rosemary trial of 0.5 %, control group.

The lowest feed conversion efficiency for the whole experimental period was registered at the Rosemary trial 0.5 %, followed by the Anise trial of 1 %, the anise trial 0.5 %, the Rosemary trial of 1 %, and then the control group. Al-Kassie upon the obtained results had considered that the Anise and the Rosemary could be potential growth promoters for the broiler hens.

Ghazalah and Ali (2008) had obtained positive results by the administration of Rosemary as powder (in a concentration of 0.5; 1 and 2 %) as additives in the broiler hens feed (the experimental period 7-49 days). The trial which got as additives Rosemary powder 0.5 %, at the end of the experiment had presented a body weight gain (1874.67 g compared to 1741.67 g) and a feed conversion efficiency of (1.97 compared to 2.07) superior to Control group.

Csuka at al. (2005) had achieved the reduce of the abdominal fat deposit at quail by the administration of Rosemary powder, but the production parameters (daily feed intake, the eggs production) didn't obtain the requested values by intensive nutrition.

Based on the positive results obtained, we highly recommend the use of this aromatic plants in the growing technology of broiler hens as growth promoters.

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