RESEARCHES ON THE USE OF FEED ADDITIVE BABY C4 IN BROILER CHICKEN DIETS

Nicoleta Daniela Bortă (Frunză), I.M. Pop

"Ion Ionescu de la Brad" University of Agricultural Sciences and Veterinary Medicine Iaşi, Faculty of Animal Husbandry
e-mail: nicoleta_f_b@yahoo.com

Abstract

The purpose of this paper was to assess parameters of broiler chicken productivity in terms of using a feed additive based on butyric acid. There were used 3 groups of chicken every group of 75 subjects, it was made a control group (C) and two experimental groups (E1, E2) which was feed with a supplemented diet with feed additive Baby C4 in different proportions: 2 ‰ in the first 21 days at E1 group and 3 ‰ in the first 7 days at E2 group. It was found an increase in body weight of experimental group of chickens around 6% (E2) to 8% (E1) and a reduction in specific consumption by 5% - 8% corresponding of lots E1 and E2 respectively, compared with body weight and specific consumption in the control group of chicken. For an analysis with an exactly results it was calculated European efficiency factor indicating E2 group with an index of 410 in first place followed by the E1 group with 400 and control subjects with 351.

Key words: broiler, poultry diet, feed additive, Baby C4

INTRODUCTION

Poultry meat is an important source of animal protein in human nutrition. The food value of poultry due to the presence in its chemical composition of the main groups of substances necessary for life: proteins, with plastic role, and lipids, with role of energy. In addition, trace elements and vitamins contained confer remarkable nutritional and organoleptic properties [7].

The low price of chicken meat products, guaranteed quality and taste appreciated by the majority, makes studies on technology growth broilers to be always a current topic. An important part of operating costs of broiler is owned by food, so research that include the possibilities to improve nutrition but also how to use the nutrients in the digestive tract of birds are and will always be the key drivers operated by professionals to increase efficiency economic.

Removing antibiotics as growth promoters in recipes for chicken meat has led to a need to improve biosecurity, genetic selection and also their replacement by new products such as probiotics, prebiotics, essential oils and organic acids [6]. It was shown that the use of acids such as fumaric, propionic, lactic and sorbic in feeding of poultry reduces digestive tract colonization with pathogenic bacteria but also reduce the producing toxic metabolites in the body [4]. From studies on the acidifiers, butyric acid was shown to have both antibacterial effects and stimulating intestinal microviles [2].

The acidifiers use in feed is based, the following main reasons: to supplement the endogenous amount of stomach acid, to supplement insufficient acid especially in young animals, reducing the pH in the digestive tract, acts as chelated agents, some organic acids have important role in energy metabolism, improvement of feed palatability [3].

The objective of this work was to evaluate the effect of using feed additive Baby C4, acidifier based on butyric acid, in broilers diets in different concentrations and periods of growth of their productive performance.

MATERIAL AND METHOD

To achieve this study were used a total of 225 Ross 308 broiler not gendered which were initially distributed in 9 cages in a battery BP4, after several division finally number of cages reached 36. Broilers were reared to the age of 38 days, the age at which they reached an average weight of 2.5 kilograms.

To achieve the experience, chicken broilers were divided into three groups (control group - LM, experimental group 1 - LE1 and experimental group 2 - LE2) 75 packs of chicken each. The three groups were kept under the same microclimate and were fed to the same feed (tab. 1) The two experimental plots were used in food the acidifier Baby C4: LE1 - within 21 days of life of chickens at a rate of 2 ‰ and the LE2 - within 7 days of life of chickens at a rate of 3‰.

Table 1 Chemical composition and nutritional value of feed used in broiler chicken diets

Specification	21-1 DS	21-1 D	21-1	21-2 G	21-2 F
Period (days)	0-7	8-14	15-24	25-32	33-38
U %	11.83	11.69	11.23	11.48	11.45
DM %	88.17	88.31	88.77	88.52	88.55
ME kcal/kg	3011.39	3103.63	3175.00	3210	3229.57
CP %	23.02	22.06	20.80	19.50	19.41
CFat %	5.98	7.17	8.35	9.00	8.55
CAsh %	3.61	3.29	2.99	2.89	2.65
CF %	3.24	3.20	3.22	3.83	3.08
Ca %	1.08	1.05	1.00	0.95	0.90
Pa %	0.50	0.47	0.47	0.45	0.42
Ca/P	2.16	2.23	2.13	2.11	2.14
Lyz %	1.45	1.32	1.23	1.08	1.09
Met + Cys %	1.04	0.97	0.92	0.81	0.81

U=humidity; DM=dry matter; ME=metabolizable energy; CP=crude protein; CFat=crude fat; CAsh=crude ash; CF=cellulose fiber; Ca=calcium; P=available phosphorus; Ca/P=calcium phosphorus rapport; Lys=lysine; Met + Cys=methionine and cystine.

The temperature in the hall during the first 4 days was maintained between 32 and 30^0C and then gradually reduced to 2.5^0 C per week until it reached on day 24 at the constant temperature of 21^0C. Light program was the same throughout the experience, 24 hours of light per day.

The birds were fed with 5 types of feed so: before starter I (21.1 SD) from 0 to 7 days, before starer II (21.1 D) between 8-14 days, starter (21-1) during 15-24 days , growth (21.2 G) between 25-32 days and finishing (21.2 F) during 33-38 days. Three vaccinations were been made as follows: at 0 days (by aerosol), at 10 and at 22 days (in water), vaccination followed by an additional vitamins. For an accurate watering the drinking height was adjusted twice weekly by visual inspection.

Chicks from all groups were weighed weekly and fodder consumed by them to calculate the feed conversion index. Mortality rate was recorded daily to be corrected the index of food conversion.

RESULTS AND DISCUSSION

During those 38 days were made seven weighing of lots of chicken (tab.2, fig. 1), by calculating their averages. Compared to guide the growth of hybrid made in the study, the results were 6 to 15 percentage points higher. Reported in the control group, the weight of experimental groups were higher by 6 to 8 percentage points. Hence it may be concluded that the hybrid has higher genetic potential, as demonstrated when microclimate parameters are followed, when using a feed of better quality or when the hygiene standards are met.

Table 2 Evolution of body weight of broiler chicken in this study

Specification	LM	LE1	LE2	Literature [5]
0 days (reception)	47	50	49	42
7 days	195	188	188	182
14 days	488	490	503	455
19 days	882	892	887	741
28 days	1655	1684	1696	1412
35 days	2243	2340	2243	2021
38 days (delivery)	2447	2649	2602	2291

LM=control group; LE1=experimental group 1; LE2=experimental group 2.

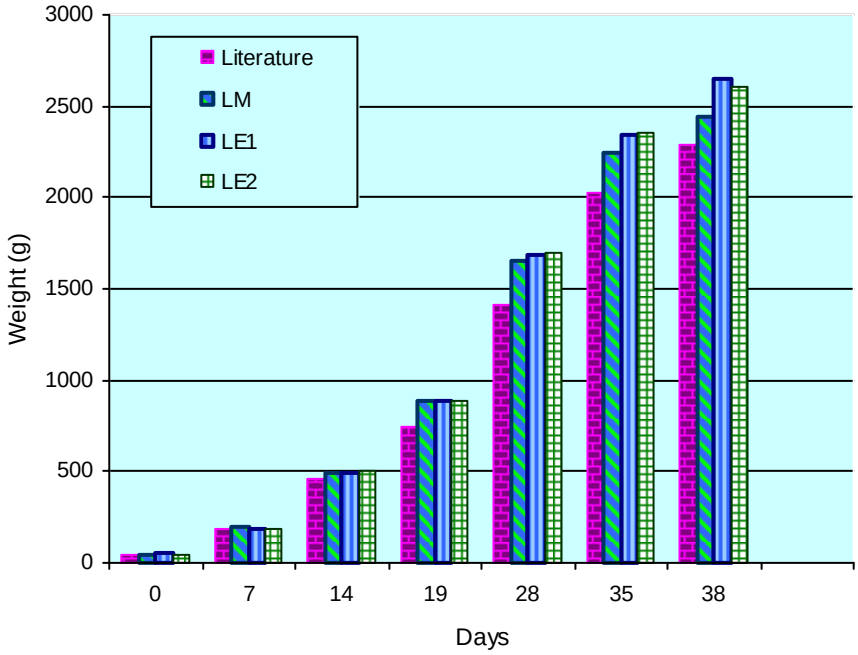

Fig. 1 Evolution of body weight of broiler chicken in this study

Differences in weight between control group and experimental stresses the importance of using acidifiers in broiler diets. If the results would be assessed only after body weight we can conclude that is more efficient to use this additive in smaller proportions, respectively 2 ‰, for longer periods of time, ie 21 days, the difference between this group and the second batch experimental being 2 percentage points.

In the food consumption for the two groups who used feed additive Baby C4, you can see lower consumption in LE2 respectively 4348 g/chick, to LE1 the consumption being over 4548 g/chick. Throughout the experience mixed fodder consumption was higher than that presented in the literature but about equal to that observed in LM (tab. 3). Contrary to results obtained in calculating body weight, food consumption is lower in the consignment has been used acidifier in higher share (3 ‰) for a shorter period of time (7 days), LE2.

Table 3 Cumulative food consumption (g / chicken) for chicken broilers of experience

Specification	**LM**	**LE1**	**LE2**	**Literature** [5]
7 days	190	191	192	161
14 days	648	649	639	523
19 days	1236	1221	1192	941
28 days	2688	2633	2549	2065
35 days	3915	3964	3804	3248
38 days	4437	4548	4348	3824

LM=control group; LE1=experimental group 1; LE2=experimental group 2.

With the help of those two previous results were calculated feed conversion index for the three groups, namely: to LM 1.81, LE 1.72 and LE2 1.67, observing a considerable difference both between experimental plots and between them and the control group (tab. 4).

Table 4 The evolution of consumer index in broilers of experience

Age (days)	Average weight (g)			Average consumption /cap pui (g)			Consumer index		
	LM	*LE1*	*LE2*	*LM*	*LE1*	*LE2*	*LM*	*LE1*	*LE2*
7	195	188	188	190	191	192	0.97	1.02	1.02
14	488	490	503	648	649	639	1.33	1.32	1.27
19	882	892	887	1236	1221	1192	1.40	1.37	1.34
28	1655	1684	1696	2688	2633	2549	1.62	1.56	1.50
35	2243	2340	2243	3915	3964	3804	1.75	1.69	1.69
38	2447	2649	2602	4437	4548	4348	1.81	1.72	1.67

LM=control group; LE1=experimental group 1; LE2=experimental group 2.

Mortality during the 38 days of experience in lots of chicks did not exceed the values listed in literature as, for LM was a mortality of 1.33% (1 chicken), for LE1 of 2.66% (2 chicken) and the LE2 was not recorded any dead chickens.

In order to compare the results it was calculated European Efficiency Factor (IEE). This indicator allows the calculation of various elements reflecting technological performance in poultry farming for meat such as poultry viability, weight, age at delivery and specific consumption [1]. After completion of this calculation can be seen that best results were obtained in LE2, where was used in the diet of chick acid dose of 3 over a period of 7 days (first 7 days of life of the offspring).

Table 5 European Efficiency Factor for broilers

IEE for LM	IEE for LE1	IEE for LE2	IEE national [1]
351.04	394.51	410.02	251.60
			365.58 (S.C. Transavia S.A.)

IEE= European Efficiency Factor; LM=control group; LE1=experimental group 1; LE2=experimental group 2.

CONCLUSIONS

Following the experience there were achieved higher body weights over both the literature and control group. As compared to control group where was obtained an average weight of 2450 g to LE1 was obtained 2650 g, weight higher with 200 g (8%) and the LE2 was obtained 2600 g, weight higher with 150 g (6%).

After calculating the consumption index the results were better at the experimental groups than the literature, at the LM was obtained an index of 1.81, indicating more than 5 percentage points over LE1 where was obtained 1.72 and 8 percentage points over LE2, 1.67 respectively.

European efficiency factor values resulting from processing the experience achieved, showed the best results in LE2 - where Baby C4 has been used in proportions of 3 ‰ for 7 days - compared to LE1 - where acidifier has been used in the proportion of 2 ‰ for 21 days.

BIBLIOGRAPHY

[1] Chebuțiu M., Chiș M., „Corelația indicatori tehnologici – rentabilitate în avicultură”, Agricultura – Ştiinţă şi practică, 2008, 1-2: 65-66;
[2] Leeson S., Namkung H., Antongiovanni M., Lee E. H., “Effect of butyric acid on the performance and carcass yield of broiler chickens”, Poultry science, 2005, 84: 1418-1422;
[3] Pop I.M., Halga P., Avarvarei T., „Nutriția și alimentația animalelor Vol I, II, III, Ed. TipoMoldova, Iași, 2006;
[4] Reza Mahdavi and Mehran Torki, “Study on usage period of dietary protected butyric acid on performance, carcass characteristics, serum metabolite levels and humoral immune response of broiler chickens”, Journal on animal and veterinary advanced, 2009, 8 (9): 1702-1709;
[5] Ross Broiler Manual, Aviagen, 2009;
[6] Simeanu D., „Biostimulatori în alimentația păsărilor”, Ed. Alfa, Iași, 2004;
[7] Vacaru-Opriş I. şi col., „Tratat de avicultură” vol. I, II şi III, Ed. Ceres, Bucureşti, 2004.