RESEARCH ON THE RESULTS OBTAINED WHEN SEVERING BROILER CHICKENS WHO'S DIET HAS BEEN SUPPLEMENTED WITH A NEW GROWTH BIO STIMULATOR

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Abstract

To identify the productive effect that the new growth bio stimulator F.A, which is based on vitamin B12, has on broiler chickens, 4 experimental batches (L1exp – L4exp) and a control one (Lc) have been formed, each of these consisting of 50 chickens. The fowl in the experimental batches has been fed with food containing 50, 100, 150 and 200 ppm, respectively, of bio stimulator. At the end of the growth period, that is 42 days, 10 individuals from each flock have been sacrificed (5♂ and 5♀), and the carcasses resulted have been severed into their components (breast, inferior gammons, superior gammons, wings and remnant parts - hocks, shanks, toes and necks).

Following the analysis of all the presented data regarding the participation of the severed parts in the carcass conformation of both female and male chickens, it has been concluded that the best results have been registered in the batch with the highest body development level, namely in the L4exp, where the growth biostimulator has been administered via food in a quantity of 200 ppm.

Key words: *broiler chicken, bio stimulator, carcasses*

INTRODUCTION

Research on the use of growth stimulators within the diet of broiler chickens in order to enhance food conversion and the speed of growth without harming the fowl, and to improve the quality of the carcass represents a practice which is nationally and internationally performed. (*Eseceli H. and col., 2010, Simeanu D., 2004; Midilli M. and col., 2008*). It is within this context that the present research is integrated as well, focusing on the usage of vitamin B12 - based growth stimulator F.A. in the nutrition of the commercial chicken hybrids of Ross 308.

MATERIAL AND METHOD

The experiment has been conducted in the Biobasis of the University of Agricultural Sciences and Veterinary Medicine from Iaşi, using an effective of 250 individuals. They have been divided into 5 batches, each of 50 chickens. There have been 4 experimental batches L1 exp - L4exp and a control one Lc *(tab. 1).* The chickens have been raised in the battery BP-4.

Table 1.

The scheme of the experiment structure

Batches	No.of chickens	The growth period (days)	Administered food			Supplementary food**	Indicators observed
			1-10 days	11-28 days	29-42 days		
Lc	50	42	n.c.* starter	n.c.* grower	n.c.* finisher	-	The weight of the severed portions from the carcasses
L1exp	50	42				50 ppm	
L2exp	50	42				100 ppm	
L3exp	50	42				150 ppm	
L4exp	50	42				200 ppm	

*Note: * combined diet; **growth bio stimulator F.A.*

In the feeding process of chickens, we have used combined diets consisting of cereals, animal - and vegetal - originating proteins and synthesis amino-acids. The nutritive values of the recipes used are given in *table 2.*

The combined - food diet applied to the experimental batches (L1 exp - L4 exp) has been supplemented with a quantity of 50, 100, 150, 200 ppm, respectively, of growth bio stimulator F.A., which has been produced by S.C. Antibiotice S.A. Iaşi.

Table 2.

The nutritive values of the food – combined recipes given to the chicken batches

	Starter	Grower	Finisher
ME kcal/kg	3017	3175	3225
Crude protein %	24.50	22.50	21.00
Crude fat %	6.59	7.87	7.84
Crude fiber %	4.09	4.33	4.09
Ca %	1.05	0.90	0.85
P available %	0.50	0.45	0.42
Na %	0.17	0.16	0.16
Cl %	0.20	0.22	0.22
Lysine %	1.50	1.28	1.10
Lysine available poultry %	1.35	1.10	0.92
Methionine %	0.68	0.62	0.53
Methionine available poultry %	0.64	0.57	0.48
Methionine +Cystine %	1.09	1.05	0.95
Methionine +Cystine poultry %	0.96	0.91	0.80
Threonine %	1.12	0.96	0.93
Tryptophan %	0.27	0.24	0.21

At the end of the growth period, that is 42 days, 10 individuals from each flock have been sacrificed (5♂ and 5♀), and the carcasses resulted have been severed into their components (breast, inferior gammons, superior

gammons, wings and remnant parts - wings, hocks, shanks, toes and necks). The resulted data have been processed and interpreted statistically.

RESULTS AND DISCUSSIONS

The weight of the breast, taken separately from male and female chickens, is presented within *table 3*, wherefrom one can conclude that, in the former's case, the value registered in the Lc batch (295.25 g) is inferior to the ones registered within the experimental batches (307.75-385.00 g). Therefore, the experimental groups have scored values higher with 4.23-30.39% than the control batch has. The biggest breast weight has been obtained in batch L4exp, being of 385 g.

Table 3.

Breast weight in male and female chickens used in the experiment

Batches	Males		Female	
	$\bar{x} \pm s_{\bar{x}}$ (g)	*V%*	$\bar{x} \pm s_{\bar{x}}$ (g)	*V%*
Lc	295.25±13.52	6.56	249.25±10.21	2.75
L1exp	307.75±11.27	5.51	251.75±12.45	3.33
L2exp	348.25±15.84	4.84	259.50±12.66	8.40
L3exp	358.75±10.15	4.96	276.05±10.30	4.50
L4exp	385.00±16.12	6.32	325.00±19.13	9.87
Fisher test	$F_{\alpha 0.05}(4;20)=2.87$; $F_{\alpha 0.01}(4;20)=4.43$; $F_{\alpha 0.001}(4;20)=7.10$			
	$\hat{F}=15.21$; $\hat{F} > F_{\alpha 0.001}(4;20)$ (***)		$\hat{F}=12.45$; $\hat{F} > F_{\alpha 0.001}(4;20)$ (***)	
Tukey test: for males $W_{0.05}=49.62$ $W_{0.01}=62.41$ for female $W_{0.05}=61.45$ $W_{0.01}=76.23$	L4exp-Lc	***	L4exp-Lc	***
	L4exp-L1exp	***	L4exp-L1exp	**
	L4exp-L2exp	n.s.	L4exp-L2exp	**
	L4exp-L3exp	n.s.	L4exp-L3exp	n.s.
	L3exp-Lc	***	L3exp-Lc	n.s.
	L3exp-L1exp	**	L3exp-L1exp	n.s.
	L3exp-L2exp	n.s.	L3exp-L2exp	n.s.
	L2exp-Lc	**	L2exp-Lc	n.s.
	L2exp-L1exp	n.s.	L2exp-L1exp	n.s.
	L1exp-Lc	n.s.	L1exp-Lc	n.s.

*Notă: Fisher test: * - significantly; ** - significantly distinct; *** - very significant.*

*Testul Tukey: n.s. - insignificant; ** - significantly; *** - very significant.*

The low values registered in the variability coefficients indicate a very good homogeneity in all the groups of male chickens. Statistically speaking, considerably significant differences have been noticed between batches L4exp-Lc; L4exp-L1exp; L3exp-Lc and significant differences between batches L3exp-L1exp; L2exp-Lc.

In the case of female chickens from the control batch, the breast weight has reached a quantitative of 249.25 g, whereas the experimental batches have boasted values higher with 1-30.39%. The homogeneity of female chicken batches has been, as with the male ones, very good. The considerably significant statistic differences have been found between batches L4exp-Lc, while the significant ones between L4exp-L1exp and L4exp-L2exp.

The weight of inferior gammons has ranged from 167.75 g to 226 g (male batches) and from 143.25 g to 188 g (female batches), as one can see in *table 4*. The lowest values have been associated with the control batch, whereas the highest ones with the experimental batch L4exp.

Table 4.

Inferior gammons weight in male and female chickens used in the experiment

Batches	Males		Female	
	$\bar{x} \pm s_{\bar{x}}$ (g)	*V%*	$\bar{x} \pm s_{\bar{x}}$ (g)	*V%*
Lc	167.75±7.46	4.10	143.25±4.58	3.34
L1exp	187.25±4.96	6.57	151.50±3.51	1.37
L2exp	190.54±6.34	4.64	159.75±5.68	6.57
L3exp	192.00±7.24	6.43	171.25±7.36	5.45
L4exp	226.00±5.08	6.51	188.00±6.56	6.84
Fisher test	$F_{\alpha 0.05}(4;20)=2.87$; $F_{\alpha 0.01}(4;20)=4.43$; $F_{\alpha 0.001}(4;20)=7.10$			
	$\hat{F}=10.65$; $\hat{F}>F_{\alpha 0.001}(4;20)$ (***)		$\hat{F}=9.42$; $\hat{F}>F_{\alpha 0.001}(4;20)$ (***)	
Tukey test for males $W_{0.05}=34.21$ $W_{0.01}=43.56$ for female $W_{0.05}=31.84$ $W_{0.01}=40.54$	L4exp-Lc	***	L4exp-Lc	***
	L4exp-L1exp	**	L4exp-L1exp	**
	L4exp-L2exp	**	L4exp-L2exp	n.s.
	L4exp-L3exp	n.s.	L4exp-L3exp	n.s.
	L3exp-Lc	n.s.	L3exp-Lc	n.s.
	L3exp-L1exp	n.s.	L3exp-L1exp	n.s.
	L3exp-L2exp	n.s.	L3exp-L2exp	n.s.
	L2exp-Lc	n.s.	L2exp-Lc	n.s.
	L2exp-L1exp	n.s.	L2exp-L1exp	n.s.
	L1exp-Lc	n.s.	L1exp-Lc	n.s.

The medium weight of the inferior gammons obtained by the male chickens in the experimental batches has been higher with 11.62-34.72% than the one obtained in the control batch. The values of variability coefficients have pointed to a very good homogeneity in all the experimental groups. From a statistic point of view, considerably significant differences have been registered between the male batches L4exp and Lc, and significant differences between L4exp and batches L1exp and L2exp.

The medium weight of the inferior gammons resulted in female chickens from the control batch has been of 143.25 g, a value which is lower with 5.75-31.23% than the ones obtained by their counterparts in the

experimental batches. As well as in the case of male chickens used in the experiment, the homogeneity of all female groups has been very good. Statistically, there have been no differences between these batches.

Table 5 shows the weight of the superior gammons for male and female chickens, separately.

In the control batch, the medium weight of the superior gammons has been of 201.50 g for males, and of 179.50 g for females. These have been surpassed by the ones registered in the experimental groups by 11.78-24.44% (in the males' case) and by 5.59-11.55% (female individuals). The homogeneity of all batches has been very good.

Table 5.

Superior gammons weight in male and female chickens used in the experiment

Batches	Males		Female	
	$\bar{x} \pm s_{\bar{x}}$ (g)	*V%*	$\bar{x} \pm s_{\bar{x}}$ (g)	*V%*
Lc	201.50±5.86	4.79	179.50±4.53	1.16
L1exp	225.25±4.22	4.45	189.55±7.12	3.40
L2exp	235.40±8.45	7.14	190.00±8.41	4.58
L3exp	249.35±3.58	5.09	198.25±6.47	8.35
L4exp	250.75±6.43	2.67	200.25±5.38	7.20
Fisher test	$F_{\alpha 0.05}(4;20)=2.87$; $F_{\alpha 0.01}(4;20)=4.43$; $F_{\alpha 0.001}(4;20)=7.10$			
	$\hat{F}=10.2$; $\hat{F} > F_{\alpha 0.001}(4;20)$ (***)		$\hat{F}=6.42$; $F_{\alpha 0.01}(4;20) < \hat{F} < F_{\alpha 0.001}(4;20)$ (**)	
Tukey test for males $W_{0,05}=26.10$ $W_{0,01}=32.87$ for female $W_{0,05}=14.72$ $W_{0,01}=20.50$	L4exp-Lc	***	L4exp-Lc	***
	L4exp-L1exp	n.s.	L4exp-L1exp	n.s.
	L4exp-L2exp	n.s.	L4exp-L2exp	n.s.
	L4exp-L3exp	n.s.	L4exp-L3exp	n.s.
	L3exp-Lc	***	L3exp-Lc	**
	L3exp-L1exp	n.s.	L3exp-L1exp	n.s.
	L3exp-L2exp	n.s.	L3exp-L2exp	n.s.
	L2exp-Lc	***	L2exp-Lc	n.s.
	L2exp-L1exp	n.s.	L2exp-L1exp	n.s.
	L1exp-Lc	n.s.	L1exp-Lc	n.s.

Considerably significant differences have been noticed between male batches L4exp-Lc; L3exp-Lc and L2exp-Lc. For the female chicken groups, Tukey test has revealed that batches L4exp-Lc differed considerably, whereas batches L3exp-Lc boasted significant differences.

As for the wing weight in both male and female chickens, one can conclude by checking *table 6* that the control batch has also obtained values inferior to those from the experimental batches.

Table 6.

Wing weight in male and female chickens

Batches	Males		Female	
	$\bar{x} \pm s_{\bar{x}}$ (g)	*V%*	$\bar{x} \pm s_{\bar{x}}$ (g)	*V%*
Lc	145.20±5.24	4.46	116.75±5.18	2.99
L1exp	157.75±3.42	4.54	130.00±2.56	1.26
L2exp	161.40±2.65	7.26	140.32±2.56	6.10
L3exp	167.50±3.47	6.61	144.50±4.32	9.79
L4exp	183.00±4.21	6.50	150.25±5.43	5.27
Fisher test	$F_{\alpha 0.05}(4;20)=2.87$; $F_{\alpha 0.01}(4;20)=4.43$; $F_{\alpha 0.001}(4;20)=7.10$			
	$\hat{F}=25.32$; $\hat{F}>F_{\alpha 0.001}(4;20)$ (***)		$\hat{F}=11.78$; $\hat{F}>F_{\alpha 0.001}(4;20)$ (***)	
Tukey test for males $W_{0.05}=17.73$ $W_{0.01}=22.48$ for female $W_{0.05}=16.98$ $W_{0.01}=21.72$	L4exp-Lc	***	L4exp-Lc	***
	L4exp-L1exp	***	L4exp-L1exp	**
	L4exp-L2exp	**	L4exp-L2exp	n.s.
	L4exp-L3exp	n.s.	L4exp-L3exp	n.s.
	L3exp-Lc	**	L3exp-Lc	***
	L3exp-L1exp	n.s.	L3exp-L1exp	n.s.
	L3exp-L2exp	n.s.	L3exp-L2exp	n.s.
	L2exp-Lc	n.s.	L2exp-Lc	***
	L2exp-L1exp	n.s.	L2exp-L1exp	n.s.
	L1exp-Lc	n.s.	L1exp-Lc	n.s.

Thus, for instance, male chickens from Lc have yielded wings with a weight lower by 8.64-26.03% than the one obtained in the experimental groups; the highest medium has been registered within L4exp.

In the same line of thought, the homogeneity of all the male batches has been very good (V%<10). Statistically, considerably significant differences have been noticed between L4exp-Lc and L4exp-L1exp, and significant ones between L4exp-L2exp and L3exp-Lc.

In the case of female chickens used in the experiment, the medium wing weight in the experimental batches has exceeded by 11.34-28.69% the one from the control batch. Furthermore, the homogeneity has been very good as well (V%<10). Statistically speaking, batches L4exp-Lc, L3exp-Lc and L2exp-Lc have differed considerably, whereas batches L4exp and L1exp have had significant differences.

Table 7.

The weight of the remnant parts in male and female chickens used in the experiment

Batches	Males		Female	
	$\bar{x} \pm s_{\bar{x}}$ (g)	*V%*	$\bar{x} \pm s_{\bar{x}}$ (g)	*V%*
Lc	506.80±15.24	4.21	469.20±15.11	1.09
L1exp	544.75±13.45	4.70	487.00±12.52	2.50
L2exp	587.00±12.61	7.22	508.75±12.53	7.04
L3exp	630.27±13.46	3.22	535.28±14.34	3.47
L4exp	693.25±14.27	4.91	556.38±15.45	3.37

Fisher test	$F_{\alpha 0.05}(4;20)=2.87$; $F_{\alpha 0.01}(4;20)=4.43$; $F_{\alpha 0.001}(4;20)=7.10$			
	$\hat{F}=18.20$; $\hat{F}>F_{\alpha 0.001}(4;20)$ (***)		$\hat{F}=7.39$; $\hat{F}>F_{\alpha 0.001}(4;20)$ (***)	
Tukey test for males $W_{0.05}=70.25$ $W_{0.01}=84.37$ for female $W_{0.05}=57.12$ $W_{0.01}=70.53$	L4exp-Lc	***	L4exp-Lc	***
	L4exp-L1exp	***	L4exp-L1exp	**
	L4exp-L2exp	***	L4exp-L2exp	n.s.
	L4exp-L3exp	n.s.	L4exp-L3exp	n.s.
	L3exp-Lc	***	L3exp-Lc	**
	L3exp-L1exp	***	L3exp-L1exp	n.s.
	L3exp-L2exp	n.s.	L3exp-L2exp	n.s.
	L2exp-Lc	**	L2exp-Lc	n.s.
	L2exp-L1exp	n.s.	L2exp-L1exp	n.s.
	L1exp-Lc	n.s.	L1exp-Lc	n.s.

The males from the control batch have yielded a medium weight of hocks, shanks and necks of 506,80 g, whereas the same parameter has been bigger by 7,48-36,78% in the experimental batches. Homogeneity has proved to be very good (V%<10).

Statistically, batches L4exp-Lc; L4exp-L1exp; L4exp-L2exp; L3exp-Lc and L3exp-L1exp have registered considerably significant differences, whereas batches L2exp-Lc differed only significantly. In the other gender lots, the experimental batches have recorded medium weights of remnant parts that have been superior by 3.79-18.58% to the one from the control group. As in the case of the male groups, the homogeneity in the female ones has been very satisfactory (V%<10). Statistic interpretation has shown considerably significant differences between L4exp-Lc, and significant dissimilarities between L4exp-L1exp and L3exp-Lc.

CONCLUSIONS

The comparison between the experimental batches of both female and male chickens (L1exp÷L4exp) and the control one has rendered evident the former's superiority regarding the average values for the main components of the severed carcasses (breast, inferior and superior gammons, wings, hocks, shanks and necks). *The growth bio stimulator FA* has been greatly responsible not only for the development of the carcass as a whole, but for the one of its components as well. Thus, the breast weight has been higher by 4.23-30.39% in the case of male individuals, and by 1-30.39%, when female chickens were considered; the inferior gammon weight by 11.62-34.72% for males and by 5.75-31.23% for females; the superior gammon weight superior by 11.78-24.44% in males and by 5.59-11.55% in females, respectively; wing weight increased by 8.64-26.03% in males and by 11.34-28.69% in females; and the weight of remnant parts enhanced by 7.48-36.78% in males and 3.79-18.58% in females.

After analyzing all the data related to the ratio between the severed components and the male and female carcass as a whole, one can notice that the best results have been registered by the batch with the highest level of body development, namely batch L4exp, which has been administered a diet containing the biggest quantity of *the growth bio stimulator F*A, that is 200 ppm.

REFERENCES

1. GEORGESCU GH. şi col. 2000 - Tratat de producerea, procesarea şi valorificarea cărnii. Editura Ceres, Bucureşti.
2. ESECELI H., DEMIR E., DEGIRMENCIOGLU N., BILGIC M., 2010 - The Effects of Bio-Mos Mannan Oligosaccharide and Antibiotic Growth Promoter Performance of Broilers. Journal of Animal and Veterinary Advances. Volume 9 (2), 392-395, ISSN 1680-5593
3. FISHER C., 1993 - The impact of amino acids on carcass quality in broilers. Degussa Technical Symposium, Feyetteville, Arkansas, September 14-16.
4. MIDILLI M., ALP M., KOCABAĞLI N., MUĞLALI Ö.H., TURAN N., YILMAZ H., ÇAKIR S., 2008 - Effects of dietary probiotic and prebiotic supplementation on growth performance and serum IgG concentration of broilers. South African Journal of Animal Science 38 (1). http://www.sasas.co.za/sajas.asp
5. SÂRBULESCU V., VACARU-OPRIŞ I., STĂNESCU V., VINTILĂ CORNELIA, 1983 - Tehnologia şi valorificarea produselor animaliere. Editura Didactică şi Pedagogică, Bucureşti.
6. SIMEANU D., VACARU-OPRIŞ I. and STAN GH., 2001 - Researches regarding the influence of a new bio-growth promoteur (F.A.) on the basis of vitamin B12 on the production of meat at the hen broiler. 52nd Annual Meeting of the European Association for Animal Production, Budapest, Hungary, August 26-29, pag. 116.
7. SIMEANU D., 2004 – Biostimulatori în alimentația păsărilor. Editura Alfa, Iaşi
8. VACARU-OPRIŞ I. şi USTUROI M.G., 1994 - Tehnologia industrializării produselor de origine animală. Centrul de multiplicare USAMV Iaşi.
9. VACARU-OPRIŞ I. şi col., 2004 - Tratat de avicultură, vol. III. Editura Ceres, Bucureşti.