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COMPARATIVE STUDY ON SEXES REGARDING THE OBTAINED RESULTS AT CUTTING OF POULTRY BROILER FEED WITH FOOD SUPPLEMENTED WITH A GROWING BIO-STIMULATOR BASED ON B12 VITAMIN

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Abstract

Research regarding growing promoters in feed of poultry broilers to stimulate growing speed, food conversion, to maintain the chickens' health state and to improve the carcass quality, is a practice often used at world level. In this context is also our study regarding utilization of FA growing bio-stimulator, based on B12 vitamin, which was utilised in feeding of poultry broilers. In the research were utilized 5 chickens' batches each with 50 heads, mixed sexes, from which one control batch (Lc) and 4 experimental batches (LE1-LE4). Studied chickens were feed with complete mixed fodders specific for each growing period mentioning that into the mixed fodders for experimental batches was added a bio-stimulator obtained in the fabrication process of B12 vitamin, in variable doses: LE1–50 ppm, LE2–100 ppm, LE3–150 ppm and LE4–200 ppm. The aim of the study was to make a comparative analysis of the results obtained at cutting by males and females from those 5 experience batches. At the end of growing period, 42 days, were slaughtered 10 individuals (5♂ and 5♀) from each batch, and the resulted carcasses were cut in component parts (breast, lower thighs, superior thighs, wings and back). At the end was observed the fact that FA growing bio-stimulator had a good influence not only on the size of carcass but also on the other cut parts of it. So the breast weight was higher with 4.23-30.39% at males and with 1-30.39% at females; lower thighs weight with 11.62-34.72% at males and with 5.75-31.23% at females; superior thighs weight with 11.78-24.44% at males and with 5.59-11.55% at females; wings weight with 8.64-26.03% and with 11.34-28.69% at females, and back weight with 7.48-36.78% at males and with 3.79-18.58% at females. The best results were obtained for batch LE4.

Key words: bio-stimulator, B12 vitamin, broiler, mixed fodder, sexes, cutting

INTRODUCTION

In a world in a continuous development and industrialization, peoples' health and assuring of some real quantities of animal protein for consumption necessary at world level represent those two great strategies accentuated function of demographic priority and economic development of country (Vacaru-Opriş et al., 2000, 2002).

Industry of poultry meat is the most spread one at world level from perspective of animal protein consumption, that one having technology for slaughtering/processing vertically integrated due to the ethics regarding

assuring of birds' welfare during slaughtering process, exploitation industry showing the necessity of imposing of active and productive side to assure a positive image among the final consumers (Guerrero-Legarreta and Hui, 2010).

From the many factors, which are involved in realisation of poultry meat production nutrition plays an important role and impose the approach of poultry meat quality concept from perspective of a continuous correlation between slaughtering technology ethics and assuring of some suitable technological parameters for respecting the ethics but also favourable for obtaining of a demanded quality for meat (Radu-Rusu R.M. et al., 2013, Simeanu D., 2016). Also, is necessary to optimize the technological parameters involved in operations on the industrial slaughtering flow and final processing of chickens for limitation, counter measuring or elaboration of some viable technological solutions for obtaining of carcasses or anatomical cut parts from carcass composition which could be economically capitalized on basis of some microbiological, physical, technological, sensorial and chemical properties (Marcu N. et al., 2008, Radu-Rusu R.M. et al., 2006).

In feeding of birds reared for meat, especially for hen broiler chickens are utilised numerous bio-stimulating substances with beneficial effects on birds' health and implicit on productive performances and from all of those vitamins had an important role (Simeanu D., 2001, 2004; Şara A. and Mierliţă D, 2003).

Chopping of bird carcasses is realized in different ways function of market demands. In Romania, chopping of hen broiler chicken carcasses supposes their cut in the following component parts: breast; whole thighs or inferior thighs and superior thighs; wings and back (Georgescu G. et al., 2000).

In technical literature exists data which present the results for chopping the hen broiler chickens' carcasses but are not founded different data on sexes so are the ones connected with feeding and growing, so with the current papers we proposed to make a small step in this direction.

MATERIAL AND METHOD

Experiment was organized on a batch of 250 individuals which were distributed in 5 batches each of them with 50 chickens. So were 4 experimental batches LE1–LE4 and a control batch Lc (tab. 1).

For chickens' feeding were used mixed fodders, composed by cereals, protein fodders with animal origin, protein fodders with vegetal origin and synthesis amino acids. Nutritive characteristics of administrated mixed fodders were similar with the demands of utilised hen commercial

hen hybrid.

Table 1

Experimental design scheme

Batches	Nr. of chickens	Nr. of days	Administrated food in period of			Supplementary food**	Goals:
			start	growing	finishing		
Lc	50	42	MF*	MF*	MF*	-	- mass of cut portion in carcass composition
LE1	50	42				50 ppm	
LE2	50	42				100 ppm	
LE3	50	42				150 ppm	
LE4	50	42				200 ppm	

*Note: *M.F. = mixed fodder*
***FA growing bio-stimulator*

Mixed fodders destined to experimental batches (LE1-LE4) were supplemented with 50, 100, 150, 200 ppm FA growing bio-stimulator. This is an indigenous product, made by S.C. „Antibiotice" S.A. Iaşi; being in fact a by-product resulted at processing of B_{12}vitamin, obtained after filtration of a culture environment, operation necessary for extraction of that vitamin. Together with the main product, B_{12}vitamin, result also a fine powder, with a dark brownish colour, which contain micro-organisms and their culture environment. The utilised micro-organisms for elaboration of B_{12}vitamin are: *Bacillus megaterium, Streptomyces griseus, Streptomyces aureofaciens, Streptomyces olivaceus* and*Streptomyces fradiae*, and the culture environment, on which develops, it is composed by molasses and mineral salts.

At the end of growing period, 42 days, were slaughtered 10 individuals (5♂ and 5♀) from each batch, with a corporal mass very close to batch mean and the resulted carcasses were cut in component parts (breast, lower thighs, superior thighs, wings and back). The resulted data after weighting of cut parts were statistically processed and discussed.

RESULTS AND DISCUSSIONS

Breast mass, separated on males and females, is presented in table 2, where could be observed that at males the recorded value for control batch (295.25 g) was inferior to recorded means for experimental batches (307.75-385.00 g). So the experimental batches obtained higher values with 4.23-30.39% face to control batch. The highest mass of breast was recorded at batch LE4of 385 g.

The low values obtained for variability coefficients show a very good homogeneity of all male batches. Statistically speaking, were observed

very significant differences between batches LE4-Lc; LE4-LE1; LE3-Lc and significant between batches LE3-LE1; LE2-Lc.

Table 2

Mass of breast at males and females

Experimental batches	Males		Females	
	$\bar{x} \pm s_{\bar{x}}$ (g)	V%	$\bar{x} \pm s_{\bar{x}}$ (g)	V%
Lc	295.25±13.52	6.56	249.25±10.21	2.75
LE1	307.75±11.27	5.51	251.75±12.45	3.33
LE2	348.25±15.84	4.84	259.50±12.66	8.40
LE3	358.75±10.15	4.96	276.05±10.30	4.50
LE4	385.00±16.12	6.32	325.00±19.13	9.87
Fisher test	$F_{5\%}(4;20)=2.87$; $F_{1\%}(4;20)=4.43$; $F_{0.1\%}(4;20)=7.10$			
	$\hat{F}=15.21$; $\hat{F}>F_{0.1\%}(4;20)$ (***)		$\hat{F}=12.45$; $\hat{F}>F_{0.1\%}(4;20)$ (***)	
Tukey test W values: for males $W_{0.05}=49.62$ $W_{0.01}=62.41$ for females $W_{0.05}=61.45$ $W_{0.01}=76.23$	LE4-Lc	***	LE4-Lc	***
	LE4-LE1	***	LE4-LE1	**
	LE4-LE2	n.s.	LE4-LE2	**
	LE4-LE3	n.s.	LE4-LE3	n.s.
	LE3-Lc	***	LE3-Lc	n.s.
	LE3-LE1	**	LE3-LE1	n.s.
	LE3-LE2	n.s.	LE3-LE2	n.s.
	LE2-Lc	**	LE2-Lc	n.s.
	LE2-LE1	n.s.	LE2-LE1	n.s.
	LE1-Lc	n.s.	LE1-Lc	n.s.

*Note: Fisher test: * - significant; ** - distinct significant; *** - very significant.*
*Tukey test: n.s. – insignificant; ** - significant; *** - very significant.*

At females from control batch, was recorded a breast mass of 249.25 g, while at the ones from experimental batches were realised higher values with 1-30.39%. The homogeneity of females batches was, as at males, very good. Very significant statistically differences were founded only between batches LE4-Lc, and the significant ones between LE4-LE1 and LE4-LE2.

Mass of inferior thighs was between 167.75 g and 226 g, at males and 143.25-188 g, at females (tab. 3). The lower values were observed at control batch and the highest ones at experimental batch LE4.

Males from experimental batches realised mean masses for inferior thighs higher that the ones from batch Lc with 11.62-34.72%. Values of variability coefficients show a very good homogeneity for all experimental batches. Statistically speaking, between male batches were recorded very significant differences, between batches LE4 and Lc and significant differences between batch LE4 and batches LE1 and LE2.

At females, control batch realised a mean mass of inferior thighs of 143.25 g, value with 5.75-31.23% lower than the recorded values by experimental batches. As at male batches was observed that homogeneity of all female batches was very good. Statistically, weren't founded differences

between those batches.

Table 3

Mass of inferior thighs at males and females

Experimental batches	Males		Females	
	$\bar{x} \pm s_{\bar{x}}$ (g)	V%	$\bar{x} \pm s_{\bar{x}}$ (g)	V%
Lc	167.75±7.46	4.10	143.25±4.58	3.34
LE1	187.25±4.96	6.57	151.50±3.51	1.37
LE2	190.54±6.34	4.64	159.75±5.68	6.57
LE3	192.00±7.24	6.43	171.25±7.36	5.45
LE4	226.00±5.08	6.51	188.00±6.56	6.84
Fisher test	$F_{5\%}(4;20)=2.87$; $F_{1\%}(4;20)=4.43$; $F_{0.1\%}(4;20)=7.10$			
	$\hat{F}=10.65$; $\hat{F}>F_{0.1\%}(4;20)$ (***)		$\hat{F}=9.42$; $\hat{F}>F_{0.1\%}(4;20)$ (***)	
Tukey test W value: for male $W_{0.05}=34.21$ $W_{0.01}=43.56$ for females $W_{0.05}=31.84$ $W_{0.01}=40.54$	LE4-Lc	***	LE4-Lc	***
	LE4-LE1	**	LE4-LE1	**
	LE4-LE2	**	LE4-LE2	n.s.
	LE4-LE3	n.s.	LE4-LE3	n.s.
	LE3-Lc	n.s.	LE3-Lc	n.s.
	LE3-LE1	n.s.	LE3-LE1	n.s.
	LE3-LE2	n.s.	LE3-LE2	n.s.
	LE2-Lc	n.s.	LE2-Lc	n.s.
	LE2-LE1	n.s.	LE2-LE1	n.s.
	LE1-Lc	n.s.	LE1-Lc	n.s.

*Note: Fisher test: * - significant; ** - distinct significant; *** - very significant.*
*Tukey test: n.s. – insignificant; ** - significant; *** - very significant.*

In table 4 are presented the mass of superior thighs, separated for males and females. At control batch were observed the following mean values for superior thighs mass: at males, 201.50 g and at females 179.50 g. This means were over-passed by the ones founded at experimental batches with 11.78-24.44% for males and with 5.59-11.55% for females. The homogeneity of all batches was very good.

At male batches were very significant differences between LE4-Lc; LE3-Lc and LE2-Lc. For females, the Tukey test show very significant differences between batches LE4-Lc and significant differences between batches LE3-Lc.

Regarding the wings mass at males and females, from data presented in table 5 it could be observed the fact that at control batch were, also, obtained superior values for experimental batches.

So for example, at males, batch Lc recorded a mean of wings mass lower with 8.64-26.03% face to experimental batches; the highest mean being obtained at batch LE4.

In the same way, the homogeneity of all male batches was very good

(V%<10). Statistically, could be appreciated that were very significant differences only between batches LE4-Lc and LE4-LE1 and between batches LE4-LE2 and LE3-Lc differences were significant.

Table 4

Mass of superior thighs at males and females

Experimental batches	Males		Females	
	$\bar{X} \pm s_{\bar{X}}$ (g)	V%	$\bar{X} \pm s_{\bar{X}}$ (g)	V%
Lc	201.50±5.86	4.79	179.50±4.53	1.16
LE1	225.25±4.22	4.45	189.55±7.12	3.40
LE2	235.40±8.45	7.14	190.00±8.41	4.58
LE3	249.35±3.58	5.09	198.25±6.47	8.35
LE4	250.75±6.43	2.67	200.25±5.38	7.20
Fisher test	$F_{5\%}(4;20)=2.87$; $F_{1\%}(4;20)=4.43$; $F_{0.1\%}(4;20)=7.10$			
	$\hat{F}=10.2$; $\hat{F} > F_{0.1\%}(4;20)$ (***)		$\hat{F}=6.42$; $F_{1\%}(4;20) < \hat{F} < F_{0.1\%}(4;20)$ (**)	
Tukey test W values: for males $W_{0.05}=26.10$ $W_{0.01}=32.87$ for females $W_{0.05}=14.72$ $W_{0.01}=20.50$	LE4-Lc	***	LE4-Lc	***
	LE4-LE1	n.s.	LE4-LE1	n.s.
	LE4-LE2	n.s.	LE4-LE2	n.s.
	LE4-LE3	n.s.	LE4-LE3	n.s.
	LE3-Lc	***	LE3-Lc	**
	LE3-LE1	n.s.	LE3-LE1	n.s.
	LE3-LE2	n.s.	LE3-LE2	n.s.
	LE2-Lc	***	LE2-Lc	n.s.
	LE2-LE1	n.s.	LE2-LE1	n.s.
	LE1-Lc	n.s.	LE1-Lc	n.s.

*Note: Fisher test: * - significant; ** - distinct significant; *** - very significant.*
*Tukey test: n.s. – insignificant; ** - significant; *** - very significant.*

At females, mean mass of wings established for experimental batches was with 11.34-28.69% higher face to the mean of control batch Lc. Also, the homogeneity of female batches was very good (V%<10). Statistically speaking, were observed very significant differences between batches LE4-Lc; LE3-Lc and LE2-Lc, while between batches LE4 and LE1 differences were significant.

In table 6 are presented data regarding mass of back for males respectively females carcasses.

Table 5

Wings mass at males and females

Experimental batches	Males		Females	
	$\bar{x} \pm s_{\bar{x}}$ (g)	V%	$\bar{x} \pm s_{\bar{x}}$ (g)	V%
Lc	145.20±5.24	4.46	116.75±5.18	2.99
LE1	157.75±3.42	4.54	130.00±2.56	1.26
LE2	161.40±2.65	7.26	140.32±2.56	6.10
LE3	167.50±3.47	6.61	144.50±4.32	9.79
LE4	183.00±4.21	6.50	150.25±5.43	5.27
Fisher test	$F_{5\%}(4;20)=2.87$; $F_{1\%}(4;20)=4.43$; $F_{0.1\%}(4;20)=7.10$			
	$\hat{F}=25.32$; $\hat{F}>F_{0.1\%}(4;20)$ (***)		$\hat{F}=11.78$; $\hat{F}>F_{0.1\%}(4;20)$ (***)	
Tukey test W values: for males $W_{0.05}=17.73$ $W_{0.01}=22.48$ for females $W_{0.05}=16.98$ $W_{0.01}=21.72$	LE4-Lc	***	LE4-Lc	***
	LE4-LE1	***	LE4-LE1	**
	LE4-LE2	**	LE4-LE2	n.s.
	LE4-LE3	n.s.	LE4-LE3	n.s.
	LE3-Lc	**	LE3-Lc	***
	LE3-LE1	n.s.	LE3-LE1	n.s.
	LE3-LE2	n.s.	LE3-LE2	n.s.
	LE2-Lc	n.s.	LE2-Lc	***
	LE2-LE1	n.s.	LE2-LE1	n.s.
	LE1-Lc	n.s.	LE1-Lc	n.s.

*Note: Fisher test: * - significant; ** - distinct significant; *** - very significant.*
*Tukey test: n.s. – insignificant; ** - significant; *** - very significant.*

Table 6

Mass of back for males and females

Experimental batches	Males		Females	
	$\bar{x} \pm s_{\bar{x}}$ (g)	V%	$\bar{x} \pm s_{\bar{x}}$ (g)	V%
Lc	506.80±15.24	4.21	469.20±15.11	1.09
LE1	544.75±13.45	4.70	487.00±12.52	2.50
LE2	587.00±12.61	7.22	508.75±12.53	7.04
LE3	630.27±13.46	3.22	535.28±14.34	3.47
LE4	693.25±14.27	4.91	556.38±15.45	3.37
Fisher test	$F_{5\%}(4;20)=2.87$; $F_{1\%}(4;20)=4.43$; $F_{0.1\%}(4;20)=7.10$			
	$\hat{F}=18.20$; $\hat{F}>F_{0.1\%}(4;20)$ (***)		$\hat{F}=7.39$; $\hat{F}>F_{0.1\%}(4;20)$ (***)	
Tukey test W values: for males $W_{0.05}=70.25$ $W_{0.01}=84.37$ for females $W_{0.05}=57.12$ $W_{0.01}=70.53$	LE4-Lc	***	LE4-Lc	***
	LE4-LE1	***	LE4-LE1	**
	LE4-LE2	***	LE4-LE2	n.s.
	LE4-LE3	n.s.	LE4-LE3	n.s.
	LE3-Lc	***	LE3-Lc	**
	LE3-LE1	***	LE3-LE1	n.s.
	LE3-LE2	n.s.	LE3-LE2	n.s.
	LE2-Lc	**	LE2-Lc	n.s.
	LE2-LE1	n.s.	LE2-LE1	n.s.
	LE1-Lc	n.s.	LE1-Lc	n.s.

*Note: Fisher test: * - significant; ** - distinct significant; *** - very significant.*
*Tukey test: n.s. – insignificant; ** - significant; *** - very significant.*

At males, control batch Lc obtained a mean mass for back of 506.80

g, while experimental batches recorded higher mean masses with 7.48-36.78% face to it. The batches' homogeneity was very good (V%<10). Statistically, were enlightened very significant differences between batches LE4-Lc; LE4-LE1; LE4-LE2; LE3-Lc and LE3-LE1 and significant between batches LE2-Lc.

At females, experimental batches obtained mean masses for back superior to control batch with 3.79-18.58%. As in caseof males, female batches had a very good homogeneity (V%<10). Statically speaking were noticed very significant differences between batches L4exp-Lc, and significant differences were observed between batches LE4-LE1 and LE3-Lc.

CONCLUSIONS

At experimental batches, males and females, (LE1 and LE4) face to control one (Lc), mass of main cut portions in carcass composition (breast, lower thighs, superior thighs, wings and back) was superior.FA growing bio-stimulator had a good influencenot only on carcass size, in its ensemble, but also on those cut parts from carcass. So the breast mass was with 4.23-30.39% higher at males and with 1-30.39% at females; mass of inferior thighs was with 11.62-34.72% at males and with 5.75-31.23% at females; mass of superior thighs was with 11.78-24.44% at males and with 5.59-11.55% at females; wings mass with 8.64-26.03% for males and with 11.34-28.69% for females and back mass with 7.48-36.78% for males and with 3.79-18.58% at females.

From the analyse of all data presented by us regarding participation of cut parts in composition of males and females carcasses could be observed that the best results were obtained at chicken batch with the best corporal development, respectively batch LE4, where the food was supplemented with FA growing bio-stimulator in the highest rate, respectively 200 ppm.

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