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STUDIES OF CAPONS MEAT PRODUCTION BELONGING TO THE HUBBARD CHICKEN HYBRID

Cipriana Maria CUCIUREANU, Marius Giorgi USTUROI, Răzvan Mihail RADU-RUSU

University of Agricultural Sciences and Veterinary Medicine "Ion Ionescu de la Brad" of Iași,
3 Mihail Sadoveanu Alley, Iași, Romania

Corresponding author email: cipriana.cuciureanu@yahoo.com

Abstract

The research aimed to evaluate the influence exerted by the removal of the testicles (orchidectomy) in roosters, on the meat production made by them. In this regard, were formed two batches of roosters belonging to the Hubbard chicken hybrid, one batch was experimental (LE), consisting of castrated roosters at the age of 6 weeks, and one control batch (LM) consisting of uncastrated roosters. The birds of the two groups were raised under identical conditions and received the same type of compound feed; their slaughter was performed at the age of 20 weeks, on which occasion the yield at slaughter, the share of anatomical parts in the composition of the carcasses, as well as the weight of the internal organs were established. The data obtained showed that castrated males had a higher slaughter yield compare to specimens uncastrated, with 0.68% higher for dressed yield on fresh carcass and with 1.01% higher for dressed yield on maturated carcass. Also, for castrated roosters, were registered higher values for participation rates for the anatomical parts with commercial interest (by 2.92% for the breast and by 6.15% for the thighs and drumstick); also, were registered higher weights for the internal organs (by 0.72% for heart, 29.04% for liver and 20.44% for gizzard). The conclusion of the study was that the application of caponisation to Hubbard roosters led to a higher yield at slaughter and higher participation rates for the anatomical portions with commercial interest (breast, thighs and wings) compared to uncastrated specimens.

Key words: *capon, dressed yield, Hubbard, internal organs, quantitative meat production.*

INTRODUCTION

Raising castrated roosters is more practiced in Italy, France, Taiwan, China and the United States, where they are marketed as high quality products (Sinanoglou et al., 2011). According to Regulation of European Commission no. 543/2008 of 16 June 2008, "a capon is a male bird that is surgically castrated before reaching maturity and slaughtered at a minimum age of 140 days".

Castration can cause changes in the aspect and comportment of roosters, but also changes in metabolism (Chen et al., 2006). Compared to uncastrated roosters, capons have a better metabolism and higher body weights, with 10-20%; their meat is tender and juicy (Sirri et al., 2009).

Castrated roosters are characterized by high deposits of adipose tissue, especially in the abdominal area, which is considered to have a beneficial effect on improving taste properties, an important aspect for todays consumers who increasingly demand products with remarkable organoleptic properties (Mast et al., 1981; Shao et al., 2009; Sinanoglou et al., 2011). At the same time, certain classes of consumers want extra quality products that stand out from conventional poultry products.

MATERIALS AND METHODS

The biological material was represented by 30 roosters belonging to the commercial chicken hybrid "Hubbard", divided into two batches: the experimental group (LE) composed of 20 heads. and the control group (LM) composed of 10 heads.

The difference among the two batches was represented by the fact that the roosters from the experimental group (LE) were castrated at the age of 6 weeks.

Castration of roosters was performed by the method of bilateral laparotomy in the last intercostal space, puncturing the air sacs, bring to the fore the testicles, by means of a special forceps, then performing orchidectomy by unlimited torsion (Figure 1). The wound suture was made in a continuous thread.

The roosters were raised in a space with a controlled environment, on permanent bedding; growth spaces were arranged that provided an area of 0.45 m^2/head, a drip water management device (1/head) and truncated feeders (20 cm/head). Both batches were fed at discretion, with the same type of feed, characterized by a protein content of 17% and an energy value of 2800 kcal/kg.

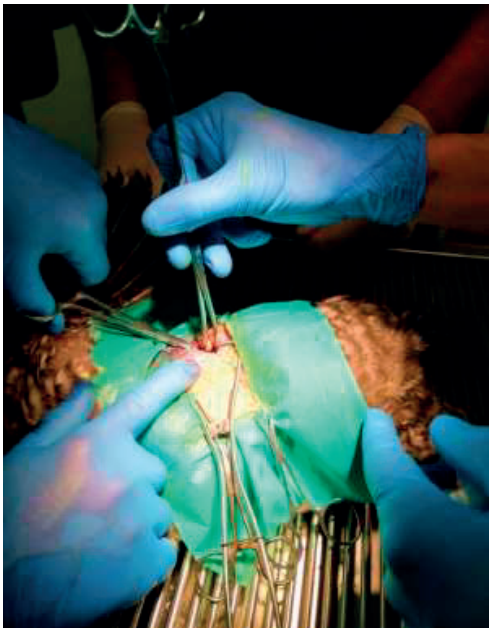

Figure 1. Torsion of the testicle

The birds of the two batches were slaughtered at the age of 20 weeks; which time the following parameters were determined:

• ***Yield at slaughter.*** It was calculated as the percentage ratio between the weight of live birds and the weight of carcasses resulting from their slaughter. It was calculated immediately after slaughter of the birds and 24 hours after slaughter, during which time the carcases were stored at a temperature of +2°C;

• ***The percentage of the trance portions participation (wings, brest, upper thighs, drumsticks, back with head and feets).*** Each trance portion was weighed individually, then reported to the weight of the carcass from which it came;

•***Weight of edible organs (heart, liver and gizzard).*** These were weighed individually, using the analytical balance.

The data obtained were statistically processed, calculating the arithmetic mean, the standard deviation of the mean and the coefficient of variation.

RESULTS AND DISCUSSIONS

Yield at slaughter

Before to slaughter, the birds were weighed and the values was noted in a document. Immediately after the suppression of life, the roosters were plucked and eviscerated. After performing these operations, the carcasses were weighed, then the yield at slaughter was calculated according to the formula.

For the control batch, was calculated an average value of 72.21 ± 2.24%, with a minimum value of 71.10% and a maximum value of 75.86%. The coefficient of variation registered a value of 3.10%, imprinting a homogeneous character for the batch (Table 2, Figure 3).

In the same mode was proceeded for the experimental batch (LE), its average value was 72.89 ± 4.55%; the minimum value calculated was 64.67%, and the maximum was 81.03%. The coefficient of variation was 6.25% (Table 1, Figure 3).

The carcasses were refrigerated for 24 hours at a temperature of +2°C; then they were weighed, and with the values obtained was calculated the yield at slaughter after refrigeration for both batches of roosters.

The control batch, after refrigeration, recorded an average value of the yield at slaughter of 70.78 ± 1.02%, with a minimum of 68.32% and a maximum value of 75.34%, the coefficient of variation being 3.81 %; while the experimental batch (LE) obtained an average of yield at slaughter after refrigeration of 71.79 ± 4.41%; the minimum value calculated was 63.90%, and the maximum value was 78.46%. The coefficient of variation was calculated to be 6.17%.

The percentage of the trance portions participation

After slaughter, the carcasses were refrigerated for 24 hours, then weighed and cut into anatomical portions (wings, breast, upper thighs, drumsticks, back with head and feets). In order to calculate the participation rate of

each anatomical portion, they were weighed and reported to the carcass weight (Figure 2).

Figure 2. Anatomical portion of two batches (left-LE, right-LM)

The experimental batch (LE) recorded for wings an average of 9.43% of the carcass weight, the breast represented from the carcass a percentage of 34.19%, the upper thighs represented 18.19% of the carcass weight, in time which drumstick recorded a percentage of 15.61%, and the back with head and feets accounted for 22.58% of the entire carcass (Table 3, Figure 4).

Regarding the control batch (LM) the proportions of the anatomical parts were: 9.26% wings, 32.97% breast, 16.97% upper thighs, 14.75% drumstick, 26.05% back with head and feets (Table 3, Figure 4).

Weight of edible organs

Immediately after evisceration, the edible organs (heart, liver, gizzard) were selected and weighed using the analytical balance.

In case of the experimental batch (LE), was recorded an average heart weight of 20.69 g, the liver weight was 75.92 g, and the gizzard weighed registered an average of 58.03 g (Table 4, Figure 5).

For the control batch (LM) the average heart weight was 20.54 g, the liver recorded an average weight of 53.87 g, while the gizzard weighed was calculated an average of 46.17 g (Table 4, Figure 5).

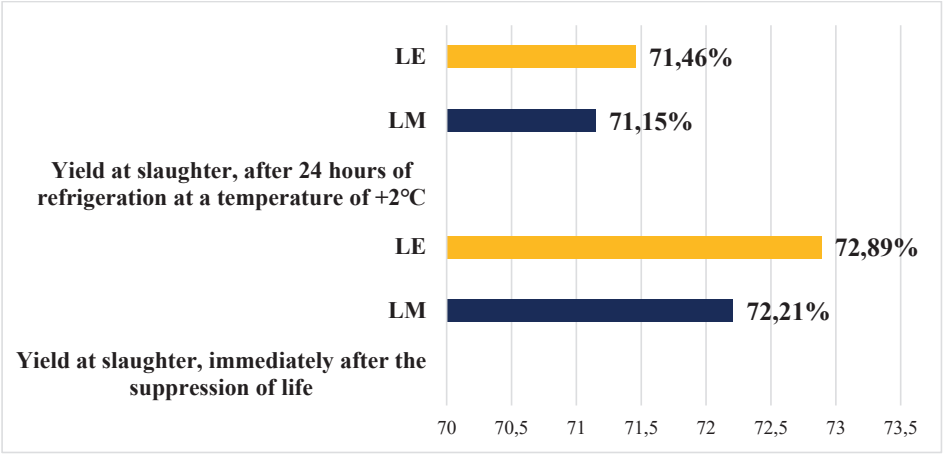

Figure 3. Average of slaughter yields obtained for the commercial hybrid "Hubbard"

Table 1. Yield at slaughter, immediately after the suppression of life

Batch	$\bar{X} + S_{\bar{X}}$ (%)	V %	Min. (%)	Max. (%)
Control	72.21 ± 2.24	3.10	71.10	75.86
Experimental	72.89 ± 4.55	6.25	64.67	81.03

Table 2. Yield at slaughter, after 24 hours of refrigeration at a temperature of +2°C

Batch	$\bar{X} + S_{\bar{X}}$ (%)	V %	Min. (%)	Max. (%)
Control	70.78 ± 1.02	3.81	68.32	75.34
Experimental	71.79 ± 4.41	6.17	63.90	78.46

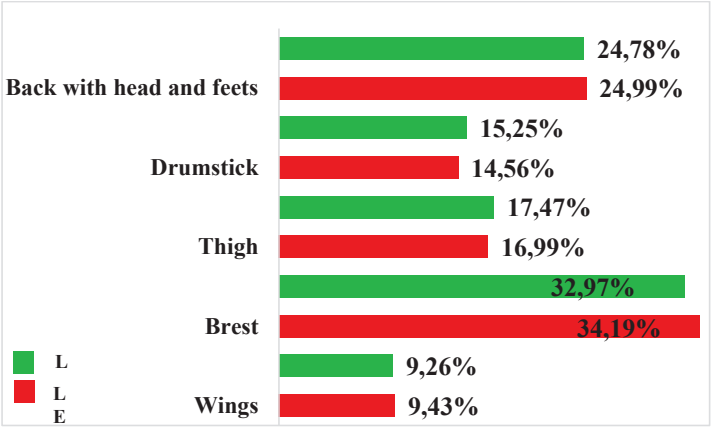

Figure 4. The percentage of portions cut into carcasses

Table 3. The percentage of the trance portions participation

Batch	Trance portion	$\bar{X} + S_{\bar{X}}$ (%)	V%	Min. (%)	Max. (%)
Experimental	Wings	9.43 ± 0.21	6.43	9.17	10.67
	Brest	34.19 ± 0.71	5.88	30.27	35.93
	Thigh	18.19 ± 0.28	4.70	15.63	17.50
	Drumstick	15.61 ± 0.14	2.64	13.15	15.26
	Back with head and feets	22.58 ± 0.91	10.35	22.93	26.15
Control	Wings	9.26 ± 0.10	2.86	9.07	9.79
	Brest	32.97 ± 1.36	10.95	27.97	35.36
	Thigh	16.97 ± 0.27	3.97	17.42	19.18
	Drumstick	14.75 ± 0.46	8.03	14.48	17.34
	Back with head and feets	26.05 ± 0.71	8.76	23.50	27.59

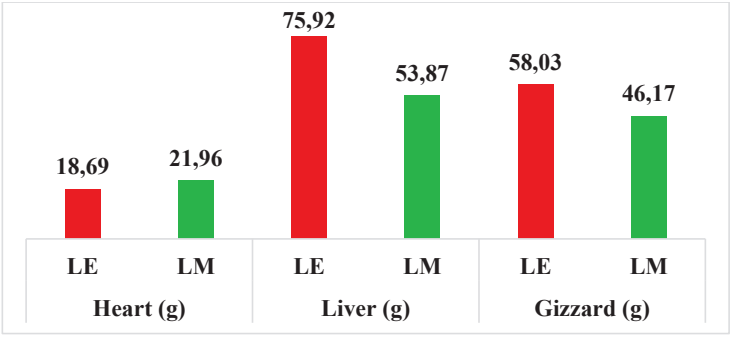

Figure 5. Average for weight of edible organs

Table 4. Weight of edible organs

Batch	Organ	$\bar{X} + S_{\bar{X}}$ (g)	V%	Min. (g)	Max. (g)
Experimental	Heart	20.69 ± 1.27	19.27	15.85	24.44
	Liver	75.92 ± 6.21	23.16	54.95	99.69
	Gizzard	58.03 ± 2.37	11.56	50.20	70.42
Control	Heart	20.54 ± 0.93	11.23	19.04	24.82
	Liver	53.87 ± 3.93	19.32	36.96	70.61
	Gizzard	46.17 ± 1.93	11.05	39.56	52.61

CONCLUSIONS

The results obtained after the slaughter of the capons obtained from the commercial chicken hybrid Hubbard led to the succeeding conclusions:

• regarding the yield at slaughter of fresh meat, for the experimental batch (LE) was calculated a higher value compared to the control batch (LM) by 0.68%;

• the value of the yield at slaughter after refrigeration, the experimental batch (LE) registered a value of 1.01% higher than the control batch (LM);

• the percentage of the trance portions participation the experimental batch (LE) registred for wings a value by 0.17% higher than the control batch (LM); regarding the share of breast participation in the carcass, the experimental batch (LE) registered an average value higher than the control batch (LM), with 1.22%. For the upper thighs the situation was identical to that of the chest. The proportion of the drumstick of the experimental batch (LE) was 0.86 higher than that of the control batch (LM). Regarding the share of participation in the carcass of back with head and feets, the situation was different, the control batch (LM) registering an average value higher by 3.47% compared to the experimental batch (LE);

• after weighing the fresh edible organs, it was observed that the experimental batch (LE) registered higher values, compared to the control batch (LM), for all three organs taken into analysis (heart, liver and gizzard); respectively 0.15 g for the heart, 22.05 g for the liver and 11.86 g for the gizzard.

The final conclusion of our study was that the application of orchidectomy (caponisation) to Hubbard roosters led to a higher yield at slaughter and higher participation rates for the anatomical portions of interest (breast, thighs and drumsticks) compared to uncastrated roosters.

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