

MEAT PRODUCTION IN ROSS-308 HYBRID UNDER EU STANDARDS WELFARE

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Abstract

Compliance with the welfare of birds is regulated at the Community level and compensated by various financial mechanisms. The investigations took into account the effects of the density provided to chicken broilers on meat production, in terms of the yield at slaughter, the weight of the anatomical portions in the carcass composition, and the internal organs' weight. In this sense, three lots of experience were formed consisting of Ross-308 chickens and which were differentiated by the density applied to the popular: $L_m = 19 \text{ cap./m}^2$ (minimum welfare conditions); $L_{exp-1} = 17 \text{ cap./m}^2$ (average conditions); $L_{exp-2} = 16 \text{ cap./m}^2$ (superior conditions). The data obtained showed that the practice of low densities during the growth of the chicken broiler ensures the obtaining of heavier carcasses, with direct effects on the slaughter yield, which was higher by 0.67% than that of chickens raised in average conditions and by 1.43% of the pups who were provided with only minimum welfare conditions. In the carcasses of chicks raised in superior welfare conditions, a higher share of anatomical parts of commercial interest was registered (breast with 1.38-2.20%, thighs with 0.32-0.60%, and wings with 0.09 -0.26%), but also higher weights of the organs (pipettes with 0.76-2.26%, hearts with 2.50-4.92% and liver with 0.30-0.95%), compared to those raised in average or minimum conditions of well-being. In conclusion, it can be stated that the practice of a density of 16 cap./m² for the Ross-308 hybrid (superior welfare conditions), positively influences both the slaughter yield and the weight of the cut parts of the carcasses and the weight of the internal organs.

Key words: well-being, Ross-308, slaughter efficiency, anatomical portions, internal organs

INTRODUCTION

Poultry meat remains competitive at the top of consumer preference [11], given its nutritional and sensory qualities and its role in ensuring the health of consumers [8].

For these reasons, forecasts for the level of poultry production in Europe indicate annual increases of approx. 5%, at least by 2030 [7].

As with other farm animals, the meat production of birds is influenced by various factors, only this species is very interested in the load of birds per unit area, due to the multiple negative effects exerted [1, 3].

Research has shown that the density provided at the time of broiler hall population is inversely related to growth performance, including feed consumption [4, 9] and implicit effects on slaughter yield [10].

The excessive number of birds introduced in the breeding halls is associated with corresponding increases of the resulting noxious substances, the effects being found in the alteration of their health condition and the decrease of the immune capacity [5, 10]; moreover, there is a deterioration in the quality of the resulting meat and a corresponding decrease in its shelf life [2, 6].

From a legislative point of view, the practice of too high densities in poultry for meat is contrary to current welfare rules applicable in the European Union [1, 9, 11].

The purpose of our study was to evaluate the effects of applying U.S. rules. On the resulting quantitative meat production, welfare (in terms of density per unit area) in the chicken broiler.

MATERIAL AND METHOD

In order to achieve the proposed goal, three groups of experience were set up (one control and two experimental), differentiated by the level at which the welfare condition

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was ensured, respectively by the density of the chicks in the breeding halls.

Thus, for the chicks from the Lm group, minimum welfare conditions were ensured (19 heads/m²), for the chicks from the Lexp-1 group average conditions (17 heads/m²), and for those that formed the Lexp-2 group superior welfare conditions (16 heads / m²).

The biological material on which our investigations were conducted was the chicken-meat hybrid Ross-308.

The studied puppies were housed in three identical halls in terms of surface area and interior facilities, and their rearing was carried out in accordance with the provisions of the technological guide of the hybrid used.

The analysis of the influence of experimental factors on the quantitative production of meat in chicken broiler was made in terms of specific indicators (slaughter yield and weight of cut portions in the carcass structure), including the weight of internal organs, given the link between their size and intensity. the metabolic processes of the chicks.

The following working methods were used to determine and assess these indicators:

- slaughter yield was calculated on the basis of the percentage ratio between the weight of live birds and that of carcasses. This indicator was calculated immediately after obtaining the carcasses (hot) and respectively after 24 hours of storage in refrigerated conditions (cold);
- the weight of the cut portions of the carcasses - each anatomical piece resulting from the cutting of the carcasses (chest, thighs, wings, and cutlery) was weighed and then related to the weight of the carcass of origin;
- the weight of the internal organs was assessed by direct weighing, using electronic scales.

The data obtained were statistically processed, calculating: arithmetic mean (\bar{X}), standard error of the mean ($\pm s_x$), and coefficient of variation ($V\%$).

RESULTS AND DISCUSSIONS

Yield at slaughter. In the case of chickens raised in minimum welfare conditions (group Lm), the lowest values for slaughter yield were kept, both for the one calculated hot (73.89%) and for the one determined after the refrigeration of the carcasses obtained (72.95%), due to the lower weight at the time of slaughter (1915.08 g), but especially the weight of the carcasses (warm carcass = 1453.36 g; refrigerated carcass = 1397.05 g). The studied characteristics showed a medium variability ($V\% = 11.17-12.56$).

Chickens that were raised in average welfare conditions (Lexp-1 group) had higher average slaughter weights than those mentioned above (1940.66 g), so the carcasses were also heavier (warm carcass = 1448.72 g; refrigerated housing = 1430.65 g); Under these conditions, the slaughter yield was better, of 74.65% (hot) and 73.72% (cold), respectively. And in this case, the parameters studied showed a mean variability at the batch level ($V\% = 10.97-11.80$).

The best values of the slaughter yield of 75.32% (hot yield) and 74.48% (cold yield) were recorded in the group of chickens where superior welfare conditions were ensured (Lexp-2). This was due to the higher live weight at slaughter (1994.42 g), but also at the higher carcass weights determined immediately after slaughter (1502.19 g) and after refrigeration, for 24 hours (1485.44 g) The two analyzed characteristics also presented a good homogeneity at the batch level, the values of the coefficient of variation being only 7.93-9.25% (tab. 1).

Table 1 Slaughter yield of studied birds

Specification	Statistical estimators (n=10)					
	Lm		Lexp-1		Lexp-2	
	$\bar{X} \pm s_{\bar{x}}$	V%	$\bar{X} \pm s_{\bar{x}}$	V%	$\bar{X} \pm s_{\bar{x}}$	V%
Live weight (g)	1915.08±52.22	19.28	1940.66±39.17	14.27	1994.42±27.90	9.89
Hot housing weight (g)	1453.36±72.39	15.74	1448.72±64.27	14.02	1502.19±48.06	9.91
Hot slaughter yield (%)	73.89±2.94	12.56	74.65±2.79	11.80	75.32±2.20	9.25
Refrigerated housing weight (g)	1397.05±63.57	14.38	1430.65±60.98	13.47	1485.44±37.79	8.04
Cold slaughter yield (%)	72.95±2.58	11.17	73.72±2.56	10.97	74.48±1.87	7.93

Share of cut-out portions. The breast, the anatomical portion with the highest selling price, had a share of 41.33% of the carcasses of the chicks that formed Lexp-2 (superior welfare conditions), compared to 39.95% in the group Lexp-1 (average welfare conditions) and 39.13% for Lm carcasses (minimum welfare conditions).

The upper legs registered participation rates between 14.99% (group Lm) and 15.24% (group Lexp-2), and the lower ones between 11.94% (group Lm) and 12.29% (group Lexp-2), while for the wings were determined proportions of 10.08% for the Lm

group, 10.25% for the Lexp-1 group and 10.34% for the Lexp-2 group.

In the case of cutlery, the highest share of carcass participation was in chickens from group Lm (23.86%), followed by chickens from the group Lexp-1 (22.59%) and the specimens that formed the group Lexp-2 (20.80%).

The studied characteristics showed a good homogeneity at the batch level, the proof in this respect being the small values of the coefficient of variation that did not exceed the threshold of 10%, in any of the analyzed situations (tab. 2).

Table 2 Share of cut carcasses in the studied birds

Specification	Statistical estimators (n=10)						
	Lm		Lexp-1		Lexp-2		
	$\bar{X} \pm s_{\bar{x}}$	V%	$\bar{X} \pm s_{\bar{x}}$	V%	$\bar{X} \pm s_{\bar{x}}$	V%	
Refrigerated housing weight (g)	1397.05±63.5	14.38	1430.65±60.9	13.47	1485.44±37.7	8.04	
Chest	g	546.66±15.95	9.22	571.54±17.82	9.85	613.93±18.46	9.5
	%	39.13±0.15	1.23	39.95±0.21	1.64	41.33±0.15	1.16
Upper thighs	g	209.42±3.48	5.25	216.31±4.39	6.41	226.38±4.96	6.92
	%	14.99±0.09	1.80	15.12±0.07	1.55	15.24±0.07	1.48
Lower thighs	g	166.81±4.69	8.89	172.96±4.46	8.15	182.56±4.80	8.31
	%	11.94±0.05	1.38	12.09±0.06	1.56	12.29±0.07	1.70
Wings	g	140.82±2.77	6.22	146.64±2.92	6.30	153.59±2.91	5.98
	%	10.08±0.02	0.58	10.25±0.02	0.65	10.34±0.02	0.52
Canteen	g	333.34±10.31	9.77	323.2±8.50	8.31	308.98±8.95	9.15
	%	23.86±0.10	1.28	22.59±0.08	1.12	20.80±0.08	1.22

Weight of internal organs. The data obtained indicated that the development of internal organs was correlated with the productive performance of the chicks from which they came, in the sense that they had higher weights than chicks with higher body weights.

For example, in the specimens with the highest body weight at the time of slaughter (Lexp-2 batch), the highest average weight of the liver (62.89 g) but also of the pipettes (28.76 g) was found, and of hearts (12.41 g).

At the opposite pole were the chickens with the lowest slaughter weight (group Lm),

in which the weight of the liver was only 62.29 g, that of the pipettes of 28.11 g and of the hearts of 11.80 g.

Intermediate values of the weight of internal organs were achieved by chickens raised in average conditions of well-being (group Lexp-1), with average values of 62.70

g for liver, 28.54 g for pipettes and 12.10 g for hearts.

The three characteristics showed a good homogeneity at the batch level, the coefficients of variability being below the threshold of 10% (tab. 3).

Table 3 Weight of internal organs in the studied birds

Specification		Statistical estimators (n=10)			
		$\bar{X} \pm s_{\bar{x}}$	V%	Minimum (g)	Maximum (g)
Lm	Liver	62.29±1.26	6.41	52	68
	Heart	11.80±0.03	0.89	11	13
	Gizzard	28.11±0.58	6.48	22	35
Lexp-1	Liver	62.70±1.26	6.43	52	63
	Heart	12.10±0.04	1.04	11	14
	Gizzard	28.54±0.55	6.07	23	37
Lexp-2	Liver	62.89±1.28	6.41	52	68
	Heart	12.41±0.03	0.83	11	13
	Gizzard	28.76±0.59	6.48	22	35

CONCLUSIONS

From the general analysis of the data on the quantitative meat production carried out by the chicken broiler to which various welfare measures were applied, the following aspects emerged.

The carcass weight was correlated with the live weight from the time of slaughter of the studied chicks so that the best slaughter yield (75.32%) was recorded by chickens raised at a density of 16 head / m² (superior welfare conditions), higher by 0.67-1.43% than that of chickens raised in average conditions (17 heads / m²) and, respectively, minimum (19 heads / m²) of welfare.

Naturally, the slaughter yield established after carcass refrigeration was lower than that calculated on hot carcasses by 0.84-0.94%.

In the case of carcasses from chickens reared in superior welfare conditions (Lexp-2 group), the highest participation rates were recorded for breast (41.33%), thighs (27.53%) and wings (10, 34%), 1.38%, 0.32% and 0.09% higher than in well-bred chickens (Lexp-1 group) respectively and 2.2% and 0.6% and by 0.26% compared to those raised in minimum welfare conditions (group Lm).

The weight of the internal organs was higher in the chicks that benefited from superior welfare conditions (Lexp-2 group),

being higher by 0.76-2.26% in the case of pipettes, by 2.50-4.92% in the of the heart and by 0.30-0.95% in that of the liver, compared to the other batches.

The conclusion of the study was that ensuring a density of 16 head / m² (superior welfare conditions) for the chicken broiler has a positive effect on the meat production obtained, both in terms of slaughter efficiency and higher weight of anatomical components. with high commercial value and even the weight of the edible organs.

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