

THE INFLUENCE OF REARING SYSTEMS ON CHOSEN CHARACTERISTICS OF PROCESSED BROILER CARCASSES

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Introduction

Modern poultry production with all industrial production characteristics has greatly put the traditional meat and egg production into the background. This tendency had a poorer production quality as a result, as well as higher expenses and unnatural way of rearing. Because of this fact, "return to nature" is becoming widely present, in some countries poultry products from half-intensive way of keeping are more common at the market, having more supporters among researchers as well as producers and customers.

With this fact in mind, the research topic within this theme was the analysis of meat quantity characteristics in broilers reared in two different ways (intensive, industrial and half-intensive). In that sense, the aim was to justify the usage of a half-intensive way of keeping broilers from the point of better quality characteristics meat production.

Material and Method

The material at the start of this experiment consisted of 400 one-day old chickens of line hybrid Ross-208. The fattening was organized in two different ways, intensive and half-intensive. In the first two weeks, the rearing was conducted within a deep-covered floor object. Then, at 14 days, the experimental chickens were divided into two groups and displaced. One group was reared within a closed object, with population density of 18 broilers per square metre, and under conditions adequate to intensive productions. The same area was provided for the other two groups within a closed space, but these broilers were provided with outlets, i.e. a way of half-intensive system.

After a seven-week fattening period, 30 broilers (15 male and 15 female) were slaughtered from each experimental group chosen at random, with the aim of examining quantity meat characteristics. Processed carcass yield was determined at the slaughter line, and then dissection and measurement of basic parts was made, i.e. thighs, drumsticks, breasts, wings, pelvis and backs. Dressing percentage, carcass mass for male (Sm) and female (Sf) separately, as well as the average for both sexes (Sm+f), were calculated on the basis of the facts previously mentioned.

The analysis of data obtained in this research was made, using common variation statistical methods. The test of how important are the differences shown, was done using the following variation analysis model:

$$Y_{ijk} = \mu + (Wr)i + (S)j + (WrS)ij + e_{ijk}$$

that is, the model corresponding the two-factor plan (2 ways of rearing, Wr, and 2 sexes, S).

Research Results and Discussion

The information on broiler processed carcass yield in the examined groups are shown in chart 1.

Chart 1: Broiler processed carcass yield

Keeping system	Sex		Mass before slaughter (g)	Cold carcass	
				Mass (g)	Dressing percentage
In	Sm	\bar{x}	1936	1262	65.19
		cv	12.31	12.08	2.45
	Sf	\bar{x}	1638	1092	66.67
		cv	8.50	9.25	3.88
	Sm+f	\bar{x}	1787	1177	65.94
		cv	13.68	13.05	3.40
Hi	Sm	\bar{x}	1864	1205	64.66
		cv	11.22	11.22	1.55
	Sf	\bar{x}	1660	1087	65.39
		cv	12.26	13.37	1.88
	Sm+f	\bar{x}	1762	1146	65.03
		cv	12.93	13.13	1.79

In - Intensive

Hi - Half - intensive

From these information in chart 1, it may be noticed that male and female broilers reared in intensive way had a characteristic of higher processed and cold carcass dressing percentage, compared to hens, that is, cocks in half-intensive way of rearing. From the point of average dressing percentage value for both sexes, it may be inferred that in half-intensive reared broilers it was 65.94%, that is, 0.91% higher, compared to outlet reared broilers. The test of the differences shown proved their statistical insignificance. In addition, bearing in mind that yield, i.e. processed carcass dressing percentage makes an important part of quality, these research results point to the conclusion that outlet reared broilers, despite small differences, achieved equally good results to those of intensive reared ones.

Chart 2 contains results of processed carcass dissection into basic parts.

From the information in chart 2, it may be inferred that male broilers compared to female ones, had a higher thighs, drumsticks and wing share.

Chart 2: Broiler basic carcass parts share (%)

Keeping system	Sex	Thighs	Drumsticks	Breasts	Wings	Pelvis	Backs
In	Sm	\bar{x}	16.45	18.07	25.20	12.84	14.16
		cv	4.29	4.59	6.74	6.79	8.15
	Sf	\bar{x}	15.85	17.42	26.16	12.56	14.84
		cv	6.52	5.11	6.00	5.74	15.98
	Sm+f	\bar{x}	16.15	17.74	25.68	12.70	14.50
		cv	5.71	5.12	6.54	6.29	14.48
Hi	Sm	\bar{x}	16.84	17.62	26.61	12.56	13.53
		cv	3.17	5.25	9.76	6.62	11.17
	Sf	\bar{x}	16.02	17.22	27.05	12.34	14.34
		cv	4.22	3.59	7.65	7.26	7.21
	Sm+f	\bar{x}	16.43	17.42	26.83	12.45	13.93
		cv	4.43	4.59	8.64	6.88	9.60

From the point of the examined ways of rearing influence, it can be noticed that outlet reared broilers had a higher thigh share of 0.28% on the average, and 1.15% breast share, compared to the intensive reared ones. In addition, the data from the chart indicate that a higher breast share is followed by a lower share of other, less valuable basic parts (wings, pelvis and backs). Among these less valuable parts, the biggest and the most important source of differences between the examined ways of rearing, was lower relative pelvis share in half-intensive reared broiler processed carcass mass. Such result could have been the effect of some processes in the organism, which were directed to stronger breast muscle tissue formation on account of fat abdominal tissue, the formation of which is more significant in intensive reared broilers than in outlet reared ones.

The differences in basic parts share in processed carcass mass caused the differences in certain meat categories share (chart 3). The analysis of data from chart 3 points out that sex differences in 1. and 2. category meat share were small. A bit bigger difference between sexes occurred in the third category meat share, but this one was not statistically significant. However, the test of these differences between broilers reared in two different systems proved that the difference of 1.11% in 1. category meat share for the outlet reared ones was statistically significant. Therefore, it may be inferred that outlet reared broilers had a bigger 1. category meat share, compared to intensive reared ones, which, however, had a little bit greater 2. and 3. category meat share.

Finally, it should be noted that, despite small possibilities of comparing these information to those from available literature (due to genetic basis, growth, dissection methods influence on yield, i.e. processed carcass dressing percentage and basic parts share), the results of the present study comply with those reported by Dakić et al., (1982) and Varga (1981). In addition, the results of the way of rearing influence on certain meat categories share in processed carcass mass are in accordance with those of Bogosavljević-Bošković et al., (1996) research.

Chart 3: Certain meat categories share in broiler processed carcasses (%)

Keeping system	Sex	I	II	III
In	Sm	\bar{x}	59.72	12.84
		cv	3.31	6.79
	Sf	\bar{x}	59.43	12.56
		cv	3.50	5.74
	Sm+f	\bar{x}	59.57	12.70
		cv	3.35	6.29
Hi	Sm	\bar{x}	61.07	12.56
		cv	3.78	6.62
	Sf	\bar{x}	60.29	12.34
		cv	4.37	7.26
	Sm+f	\bar{x}	60.68	12.45
		cv	4.06	6.88

Conclusion

On the basis of the way of rearing influence (intensive and half-intensive) on certain processed carcass broiler characteristics, it may be concluded that intensive reared broilers had a greater dressing percentage, as well as pelvis and backs share, that is, 3. category meat share. Outlet reared broilers (half-intensive system) had a characteristic of greater thigh and breast share, that is, 1. category meat share.

From the point of sex influence, it was proved that female chickens in both systems had a greater dressing percentage, breast, pelvis and back share. Male chickens had a characteristic of greater thigh, drumstick and wing share.

The stated results of this research infer that half-intensive way of rearing was justified from the point of processed carcass quantity characteristics.

References

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