

THE INFLUENCE OF GENOTYPE AND SEX IN BROILER CHICKENS ON CERTAIN MEAT QUALITY PARAMETERS

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INTRODUCTION

Broiler chickens meat quality is very often the topic of scientific research. It is assessed from different angles and described with different parameters. This fact is understandable if we consider a large number of genetic and ungenetic factors which influence the quality of the meat produced, in a higher or lower degree. Considering this fact, the aim of the research was the analysis of genotype and sex influence on the basic tissue contents in certain processed carcass parts. Besides, the aim was to establish the influence of the factors mentioned on chemical structure of more important carcass parts muscles.

MATERIAL AND RESEARCH METHOD

The experimental material for researching the influence of genotype and sex on certain meat characteristics consisted of 60 broiler chicken specimens, hybrid lines Hybro and Ross-208. Since half of the chosen chickens were males, and the other half were females, four experimental groups were formed (15 male and female chickens each, from both hybrids).

This research was preceded by a seven-week fattening period of the broilers mentioned, in similar feeding and nourishment conditions. After the fattening was over, broilers chosen at random were slaughtered and processed carcasses were dissected into basic parts at the slaughter line: thighs, drumsticks, breasts, wings, pelvis and backs.

Afterwards, thigh, drumstick and breast dissection was performed. These first category meat parts were dissected into basic tissues: muscles, bones and skin. When the measuring was finished, muscle tissue samples were taken for chemical analyses, i.e. determination of lipid and protein contents in the processed carcasses broiler parts.

The analysis of data obtained in this research was conducted by the usage of usual variation statistics methods. The test of the importance of the differences shown was conducted by using the following variation analysis model:

$$Y_{ijk} = \mu + G_i + S_j + (GS)_{ij} + e_{ijk}$$

that is, using the model corresponding the two factor experiment plan 2x2 (two genotypes, G, and two sexes, S).

RESEARCH RESULTS AND DISCUSSION

Dissection results, i.e. the information on certain tissue share in the first category meat (total thigh, drumstick and breast mass) are presented in chart 1.

From the information in chart 1 it may be concluded that Ross-208 established higher muscle tissue contents but lower bone and skin contents in the first category meat compared to Hybro broilers. Muscle tissue contents in those carcass parts were 1.29% higher, bone contents 1.12% and skin contents 0.25% higher in Ross-208 broilers. However, testing the differences demonstrated, it was found out that these were not significant. Yet, it may be concluded that these differences are likely to be the result of genetic basis influence, i.e. different structure characteristics of each line hybrid of broilers examined. The confirmation of this conclusion may be in the research results obtained by Dakić and associates (1982); they also pointed out the differences between the two broiler hybrid lines, Ross and Hybro.

From the point of sex influence, it has been determined that female chickens compared with the males had an average 0.86% higher muscle tissue share, and 0.47% higher skin share in the first category meat. On the other hand, female chickens had lower bone share in the first category meat, 1.38% on average. This difference was statistically important as well. It points to the conclusion that female chickens had finer skeletons, which resulted in lower bone share but higher muscle tissue and skin share. This conclusion is in accordance with Supić (1972) research results.

But, more detailed comparison of results obtained by this research with the data in available literature is certainly not possible, owing to a large number of factors influencing yield and basic tissues share in certain carcass parts (genetic basis, way of feeding, fattening technology and especially way of dissection). However, it may be observed that this research dissection results are partly in accordance with the data stated by Gühne (1979) and Ristić (1977).

Basic chemical structure, i.e. lipid and protein contents in muscle tissues of more important carcass parts in the groups examined, is presented in chart 2.

The information in chart 2 point to the conclusion that the differences in lipid and protein contents in muscle tissues of more important carcass parts were small from the point of the examined genotypes. In that sense, the differences between the sexes were to some extent larger. Male chickens contained lower lipid but higher protein content in breast and drumstick muscle tissues, and Ross-208 in thigh muscle tissues as well.

This research results concerning lipid and protein contents in white and red meat, i.e. breast, drumstick and thigh muscle tissues, are partly in accordance with the results obtained by Sekiz (1968), and Schön and Ristić (1978).



CONCLUSION

On the basis of the results in the research of genotype and sex influence on certain broiler chicken meat quality characteristics, the following conclusions may be reached:

- Ross-208 chickens, compared with Hybro chickens, had higher muscle tissue but lower bone and skin contents in the total thigh, drumstick and breast mass.

- From the point of sex influence, it may be observed that female broilers had higher muscle tissue and skin but lower bone share in the first category meat.

- From the point of lipid and protein contents in breast, drumstick and thigh muscles, the differences between the examined genotypes were small. These differences were more significant between the sexes. Male chickens had lower lipid but higher protein contents in breast and drumstick muscle tissues, and Ross-208 in thigh muscles as well.

All these results taken into account, it may be inferred that the influence of sexes on the basic tissue share in the first category meat, as well as on the breast, drumstick and thigh chemical structure, was larger than the influence of the examined genotypes.

LITERATURE

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Chart 1: Basic tissue share in the first category meat (%)

Hybrid	Sex	Tissues		
		Muscle	Bones	Skin
Ross 208	M	66.73	22.86	9.26
	F	67.31	21.76	9.68
	M+F	67.02	22.31	9.47
Hybro	M	65.15	24.25	9.46
	F	66.30	22.60	9.98
	M+F	65.73	23.43	9.72

M - male
F - female

Chart 2: Lipid (L) and protein (P) contents in more valuable carcass parts (%)

Hybrid	Sex	Breasts	Drumsticks	Thighs	
Ross 208	M	L	2.20	7.07	5.00
		P	23.20	19.16	21.02
	F	L	2.64	9.81	6.04
		P	23.06	18.38	19.82
	M+F	L	2.42	8.44	5.52
		P	23.13	18.77	20.42
Hybro	M	L	2.40	7.70	5.57
		P	23.03	18.79	19.98
	F	L	2.88	8.66	4.85
		P	23.03	18.45	21.42
	M+F	L	2.64	8.18	5.31
		P	22.84	18.62	20.70