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ANALYSIS OF DEPENDENCE BETWEEN SOME INDICATORS OF THE MEAT QUALITY IN BROILER CHICKENS GROWN IN DIFFERENT MANNERS

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Background

Modern poultry production has all the features of the industrial one. However, the tendency of turning towards natural poult raising for the biologically better quality food, is much preferred in recent years. Studies were therefore conducted with resul denoting that broilers grown in outlets have better quantitative and qualitative meat characteristics compared to the intensively raise ones (Bogosavljevic-Boskovic et al., 1999).

Objectives

In order to throw more light upon some aspects on semi-intensively reared broilers, the analysis of dependence between th more valuable carcass parts and their individual tissues mass was performed and relevant comparisons with the intensively reare broilers made.

Methods

A total of sixty Hybro broilers were used for analysing correlation between some more important carcass parts (breas drumsticks and thighs) mass and the individual tissues mass (muscles, bones and skin). This was preceded by a seven-week-ol fattening of a grater broiler number, with the experimental ones randomly chosen.

The first experimental group (Hybro I) consisted of broilers grown as usual in intensive fattening, and the second one (Hybr II) of the semi-intensively grown ones (by keeping in outlets).

After slaughter, processing and cooling of carcasses with basic parts being excised, breasts, drumsticks and thighs wer dissected on muscle tissue, bones and skin. Excision and dissection succeeded by appropriate measurements.

Correlation strength and significance between the individual characteristics was analysed, with common statistical formula used (Hadživuković, 1991).

Results and discussion

The results of correlation between carcasses and its basic tissues mass, are presented in tab.1.

From tab.1., one can see the existence of full correlation between breasts and the basic breast tissues mass in both broil groups. Correlation coefficients were statistically significant ($P<0.01$).

A considerably strong dependence existed between the mass of breast bones and that of breasts in the semi-intensively raise broilers, with a strong one in the intensively raised ones. Correlation coefficients were highly significant in either case ($P<0.01$).

Strong correlation existed between breasts and the constituent skin mass in both broilers groups, being also significant i outlet-raised ones ($P<0.05$).

From tab.2., one can see correlation dependence between drumsticks and the individual tissues mass in the broiler group under way.

From tab.2., one can see that in both experimental broiler groups existed a full correlation between drumsticks and muscl mass, with a high level of significance ($P<0.01$). Full correlation also existed between the bones and drumstick mass in semi intensively raised broilers, and a strong one in the intensively raised ones. These correlation coefficients were also found highl statistically significant ($P<0.01$).

As regards outlet reared broilers, a considerably strong and statistically highly significant correlation existed between the ski and drumstick mass, which was, however, moderate and statistically non-significant with the intensively bred ones..

The data on the correlation dependence between the mass of drumsticks and that of their individual tissues, are outlined i tab.3.

From tab.3., one can see a full and statistically highly significant correlation ($P<0.01$) between drumstick and muscle mass i both experimental broiler groups.

Furthermore, the correlation between the bones and drumsticks mass also proved to be very strong and statistically highl significant ($P<0.01$) in both broiler groups. The dependence between the mass of drumsticks and that of drumstick skin was als found to be fairly strong in the semi-intensively reared broilers, whereas it was shown as rather weak and statistically non-significa in the intensively reared ones.

As indicated by correlation coefficients on dependence between the more important carcass parts mass and muscle one, th of bones, no remarkable differences existed among the differently raised broilers, except that in correlation strength and significanc of the basic carcass parts and skin mass.

Finally, the results of studies are in full agreement with those obtained by many authors, such as Karic-Djurdjic Sonja (1976 Peric (1982) etc.

Conclusions

Based upon the analysis of correlation dependence between the individual indices on the meat quality of the differently raise broilers, the following conclusions may be drawn:

- full and statistically highly significant correlation (P<0.01) was found to exist between the mass of some more important carcass parts and that of their muscle tissue in both, semi-intensively and intensively reared broilers;

- full and highly significant correlation was determined in the outlet-raised broilers, which also holds true for that between the mass of bones and drumsticks. Such dependence proved to be strong and very significant in other cases, too;

- Finally, the difference in correlation strength and significance between basic carcass parts mass and their skin mass existing among the differently raised broilers, deserves special mention. This contributes to the fact that semi-intensively raised broilers had much stronger and statistically more justified correlation than the intensively grown ones did, with the weaker and statistically non-significant correlation found.

Pertinent literature

1. Bogosavljević-Bošković Snežana, Gajić Ž., Gajić I.: The influence of rearing systems on basic tissue and muscle chemical structure in broilers. 45 th ICOMST, Yokohama, Japan, 1999.
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4. Hadživuković S.: Statistički metodi, Beograd, 1991.

Tab. 1. Correlation between thigh mass and individual tissue mass in broilers:

Indices			Thigh tissues (g)			
			Mass of thigh (g)	Muscle	Bones	Skin
			X	Y_1	Y_2	Y_3
			Coefficient of correlation			
			Hybro I			
Mass of thigh (g)	X	Coefficient of determination	-	$0,9389^{**}$	$0,8787^{**}$	$0,2587^{NZ}$
Muscle	Y1		0,8815	-	$0,7109^{**}$	$0,0736^{NZ}$
Bones	Y2		0,7723	0,5055	-	$0,1073^{NZ}$
Skin	Y_3		0,0669	0,0054	0,115	-
Indices			Hybro II			
Mass of thigh (g)	X	Coefficient of determination	-	$0,9677^{**}$	$0,8663^{**}$	$0,8566^{**}$
Muscle	Y1		0,9366	-	$0,6617^{*}$	$0,8174^{**}$
Bones	Y2		0,7505	0,4378	-	$0,6391^{*}$
Skin	Y_3		0,7338	0,6681	0,4085	-

Tab. 2. Correlation between dissection of breasts and the mass of their individual tissues:

Indices			Tissues of breasts			
			Breast mass (g)	Muscle	Bones	Skin
			X	Y_1	Y_2	Y_3
			Coefficient of correlation			
			Hybro I			
Breast mass (g)	X	Coefficient of determination	-	$0,9393^{**}$	$0,7352^{**}$	$0,5178^{NZ}$
Muscle	Y1		0,8823	-	$0,5069^{NZ}$	$0,3260^{NZ}$
Bones	Y2		0,5406	0,2570	-	$0,3339^{NZ}$
Skin	Y_3		0,2682	0,1063	0,1115	-
Indices			Hybro II			
Breast mass (g)	X	Coefficient of determination	-	$0,9925^{**}$	$0,8641^{**}$	$0,6611^{*}$
Muscle	Y1		0,9849	-	$0,8092^{**}$	$0,6517^{*}$
Bones	Y2		0,7465	0,6548	-	$0,3527^{NZ}$
Skin	Y_3		0,4371	0,4247	0,1244	-

Tab. 3. Correlation between drumsticks mass and their individual tissues in broilers:

Indices			Tissues of drumsticks			
			Drumstick mass (g)	Muscle	Bones	Skin
			X	Y_1	Y_2	Y_3
			Coefficient of correlation			
			Hybro I			
Drumstick mass (g)	X	Coefficient of determination	-	$0,9467^{**}$	$0,8214^{**}$	$0,4063^{NZ}$
Muscle	Y1		0,8962	-	$0,6194^{*}$	$0,1465^{NZ}$
Bones	Y2		0,6747	0,3836	-	$0,5431^{NZ}$
Skin	Y_3		0,1652	0,0215	0,2949	-
Indices			Hybro II			
Drumstick mass (g)	X	Coefficient of determination	-	$0,9968^{**}$	$0,9531^{**}$	$0,8718^{**}$
Muscle	Y1		0,9936	-	$0,9322^{**}$	$0,8580^{**}$
Bones	Y2		0,9084	0,8690	-	$0,7467^{**}$
Skin	Y_3		0,7602	0,7362	0,5575	-