

## **CORRELATION BETWEEN INDIVIDUAL PRODUCTION AND SLAUGHTER TRAITS OF COBB 500 AND HUBBARD**

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### **Abstract**

The aim of this work is to define the correlation between the proportion of breast, thigh and drumstick relative to the weight before slaughter in relation to the weight of dressed grill ready carcass in two broiler hybrids (Hubbard and Cobb 500) at different ages (40 or 42 days). Positive correlation between the carcass prior to slaughtering and share of breasts, thighs and drumsticks, at the age of 40 (Hubbard) and 42 (Cobb 500) days, was monitored in Cobb 500 (except between the carcass before slaughter males and stakes thighs and drumsticks), and in line Hubbard (except between the carcass prior to slaughtering and share of breast in both sexes collectively). Positive correlation between the carcass processed for barbecue and shares breasts, thighs and drumsticks of the genotypes, in Cobb 500 (except between the carcass prior to slaughter men throat and share thighs and drumsticks), and Hubbard (except between the carcass prior to slaughtering and share of breast in both sexes collectively) at the age of 40 (Hubbard) and 42 (Cobb 500) days, was monitored.

**Key words:** correlation; weight before slaughter; share of breasts, thighs and drumsticks; dressed grill ready carcass weight; Coob 500, Hubbard.

### **Introduction**

The concept of poultry products industry is changing and adapt to the requirements of consumers (consumers). Instead of the whole carcass, market demand for separate parts or so called cut-ups (tights, drumsticks, breast file), is increasing. This phenomenon is the reason why on the level of production of broilers, more attention is paid to the quality and yield of the major carcass parts (leggs and breast). According to available literature, a number of factors affect the carcass weight (genetic, live weight before slaughter, gender, age), and directly or indirectly responsible influence the yield, or the percentage share of these, higher priced valuable main parts of the carcass.

Consumers, mostly insist on the quality of meat, and it is anticipated that in the near future sells of poultry products will solely depend on their quality, Tolimir (2006).

The aim of this work is to define the correlation relationship between the proportion of breast, thigh and drumstick relative to the

weight before slaughter in relation to the weight of dressed carcass for grill ready broilers in two hybrids at different age, which in turn is linked to the current demand in the market of Bosnia and Herzegovina (RS). Estimating of coefficients of correlation and their statistical significance thereof, gave a certain contribution in establishing the potential of the genotypes in terms of realized profitability on the market.

### **Materials and methods**

According to the regulations on the quality of poultry meat ("Off. G. of SFRY", No. 1/81 and 51/88), in relation to methods of processing, carcasses of slaughtered poultry can be marketed as: classic processed, prepared and grill ready. Fattened broilers (20 male and 20 female chickens) at age 40 (Hubbard) and 42 days (Cobb 500), were randomly sampled for slaughtering. In the poultry slaughterhouse following parameters were measured: live weight of animals before slaughter (separated by gender) and the weight of dressed carcass -

"grill ready." In addition, absolute and relative yield, ie the share of major carcass parts (breasts, thighs and drumsticks) in relation to the weight of the animals before slaughter and the weight of dressed carcasses - "grill ready", was measured to estimate the correlation coefficients and the significance thereof.

Simple phenotype correlation were estimated between the following characteristics:

- live weight before slaughter and the share of breasts, thighs and

$$r_{xy} = \frac{\sum xy - \frac{(\sum x)(\sum y)}{n}}{\sqrt{\left[\sum x^2 - \frac{(\sum x)^2}{n}\right] \left[\sum y^2 - \frac{(\sum y)^2}{n}\right]}}$$

The severity of the phenotypic correlation coefficient is discussed on the basis of Roemer- Orphalove classification.

drumsticks, for both sexes and summarized by gender,

- grill ready carcasses and a share of breasts, thighs and drumsticks, for both sexes and summarized by gender.

Phenotype correlation coefficient is calculated using the formula (Hadživuković, 1991):

Testing of statistical significance obtained correlation coefficients was done by t-test in the form>

$$t = r_{xy} \times \frac{\sqrt{1 - r^2}}{\sqrt{n - 2}}$$

## Results and discussion

The test results of the correlation relationship between the share of breasts, thighs and drumsticks in relation to the live weight before

slaughter and in relation to the weight of grill ready carcass in two hybrids in a different ageand tests of significance are shown in table 1 and table 2.

Table 1. Correlation between live weight prior to slaughtering and share of breasts, thighs and drumsticks Cobb 500 broiler chicks (42 days) and Hubbard (40 days)

Hybrid	Gender	The correlation coefficients		t <sub>eksp.</sub>	
		r <sub>xy1</sub> (breast)	r <sub>xy2</sub> (thigh + drumst.)	r <sub>xy1</sub> (breast)	r <sub>xy2</sub> (thigh + drumst.)
Cobb 500	♂	0,951***	-0,102 <sup>NS</sup>	13,394	0,434
	♀	0,696***	0,825***	4,094	6,298
	♂+♀	0,529***	0,659***	3,833	5,402
Hubbard	♂	0,860***	0,610**	7,167	3,262
	♀	0,291 <sup>NS</sup>	0,416 <sup>NS</sup>	1,288	1,935
	♂+♀	-0,362*	0,564***	2,052	4,209

t<sub>tab</sub> for 0,05=2,021; t<sub>tab</sub> for 0,01=2,704; t<sub>tab</sub> for 0,001=3,551; (d.f.=38)

t<sub>tab</sub> for 0,05=2,000; t<sub>tab</sub> for 0,01=2,660; t<sub>tab</sub> for 0,001=3,460; (d.f.= 78)

N.S. - P>0,05; \* - P<0,05; \*\* - P<0,01; \*\*\* - P<0,001.

Results in Table 1 show that high positive correlation (r<sub>xy1</sub> (breasts) = 0.951) exist between live body weight before slaughter and share breasts in males, females ((r<sub>xy1</sub> (breasts) = 0.696) and mixed sexes (r<sub>xy1</sub> (breasts) = 0.529) of Cobb 500 broilers. All three groups have a high correlation coefficient significant statistical significance (P <0.001).

The correlation between live body weight before slaughter and share of thighs and drumsticks in females and mixed sexes (collectively), was very strong, and highly statistically significant (P <0.001), while in males this association was very weak, negative and statistically not significant (P > 0.05).

A very strong correlation was established between the live weight before slaughter and share breasts in males Hubbard ( $P < 0.001$ ). Slight, statistically insignificant, correlation was found between live body mass prior to slaughtering and share of breast in females and both sexes (sum).

The correlation between live weight prior to slaughtering and share of thighs and drumsticks in Hubbard, was a strong, males and both sexes (sum) ( $P < 0.01$ ) and highly significant ( $P < 0.001$ ), while in the female association was moderate, but statistically not significant ( $P > 0.05$ ).

Table 2. Correlation between the grill ready carcass and shares of breasts, thighs and drumsticks Cobb 500 broilers (42 days) and Hubbard (40 days)

Hybrid	Gender	The correlation coefficients		t eksp.	
		$r_{xy1}(\text{breast})$	$r_{xy2}(\text{thigh + drumst.})$	$r_{xy1}(\text{breast})$	$r_{xy2}(\text{thigh + drumst.})$
Cobb 500	♂	0,887***	-0,522*	8,213	2,610
	♀	0,417 <sup>NS</sup>	0,706***	1,940	4,228
	♂+♀	0,482**	0,407**	3,394	2,750
Hubbard	♂	0,711***	0,370 <sup>NS</sup>	4,309	1,689
	♀	0,214 <sup>NS</sup>	0,323 <sup>NS</sup>	0,934	1,442
	♂+♀	-0,367*	0,578***	2,430	4,346

$t_{\text{tab}}$  for 0,05=2,021;  $t_{\text{tab}}$  for 0,01=2,704;  $t_{\text{tab}}$  for 0,001=3,551; (d.f.=38)

$t_{\text{tab}}$  for 0,05=2,000;  $t_{\text{tab}}$  for 0,01=2,660  $t_{\text{tab}}$  for 0,001=3,460; (d.f.= 78)

N.S. -  $P > 0,05$ ; \* -  $P < 0,05$ ; \*\* -  $P < 0,01$ ; \*\*\* -  $P < 0,001$

Results in Table 2 show that very strong and statistically highly significant ( $P < 0.001$ ) correlation exist between grill ready carcass weight and share breasts in males Cobb 500, while medium correlation statistically insignificant was found between grill ready carcass weight and share of breasts in females and both sexes (sum).

The correlation between grill ready carcass weight and share of thighs and drumsticks females and both sexes (sum) was strong, statistically highly significant ( $P < 0.001$ ) and highly significant ( $P < 0.01$ ), respectively, in males Cobb 500, the association was strong, the direction is negative and statistically significant ( $P < 0.05$ ).

A strong correlation exist between grill ready carcass weight and share breasts in males Hubbard. Correlation was statistically highly significance ( $P < 0.001$ ). Very slight correlation was found between grill ready carcass weight and share of breast in females.

Grill ready carcass weight of Hubbard broilers and share of thighs and drumsticks males and females, expressed weak correlations, not statistically significant ( $P > 0.05$ ), while in both sexes (collectively) connection was strong and statistically significant ( $P < 0.001$ ).

Similar researches of this topic are made in broilers, many more in other types of poultry or turkeys. Peric and Mitrovic (1989) working with different genotypes turkeys, found a very

strong or complete phenotypic correlation of the weight of the treated (chilled) carcasses and masses of breasts, thighs and drumsticks.

### Conclusions

Based on the correlation relationship between the share of breasts, thighs and drumsticks in relation to the weight before slaughter in relation to the weight of dressed carcass for broiler grill two hybrids in a different age, at the age of 40 (Hubbard), and 42 (Cobb 500) days, it can be concluded that:

Positive correlation exist between the live weight prior to slaughtering and share of breasts, thighs and drumsticks, at the age of 40 (Hubbard) and 42 (Cobb 500) days, in Cobb 500 (except between the carcass before slaughter males and stakes thighs and drumsticks), and in Hubbard broilers (except between the carcass prior to slaughtering and share of breast in both sexes collectively).

Positive correlations exist between the grill ready carcass and shares breasts, thighs and drumsticks of the genotypes, at the age of 40 (Hubbard) and 42 (Cobb 500) days, in Cobb 500 (except between the carcass prior to slaughter men throat and share thighs and drumsticks), and in Hubbard broilers (except between the carcass prior to slaughtering and share of breast in both sexes collectively).

According the obtained results it can be concluded that a much tighter relationship

(correlation) exist found in Cobb 500, among all studied traits correlated compared to the Hubbard genotype.

#### References

1. Hadživuković S.(1991). Statistički metodi s primenom u poljoprivrednim i biološkim istraživanjima, str. 461, Novi Sad.
2. Perić V., Mitrović S. (1989). Korelaciona zavisnost između mase obrađenog trupa i mase osnovnih delova u ćuraka različitih hibridnih linija. Peradarstvo, 11-12,348-349. Pravilnik o kvalitetu mesa pernate živine. Službeni list SFRJ br. 1, januar 1981, 13 14.
3. Tolimir N. (2006). Tehnologija gajenja brojlera i trendovi u proizvodnji pilećeg mesa. Primena savremenih tehnologija u živinarstvu. Institut za primenu nauke u poljoprivredi, str. 22-27, Beograd.