

## MEAT QUALITY PARAMETERS SELECTED IN YIELD OF CARCASSES AND PARTS OF BROILERS FROM TWO NON-INDUSTRIAL REARING SYSTEMS

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### Background

The poultry production in the last few decades has been intensified and nowadays it contains all characteristics of industrial production. This tendency in the poultry production development has resulted in poorer product quality, higher production costs and unnatural system of rearing. Consequently, all of these facts have led to an ever-more pronounced striving for a "return to nature" in the poultry rearing, primarily in order to produce biologically more valuable food. In that respect, the European Union countries have established standards for non-industrial poultry meat production (Talimir and Masic 2000).

### Objectives

The research topic was to determine certain parameters on meat quality of broilers (hens and cocks) reared in two different non-industrial ways of rearing (extensive rearing in a chicken pen and outlet rearing). Poultry meat quality parameters, namely slaughter yield, the abdominal fat share and basic carcass parts yields in the weight of chicks before slaughter, were analyzed. The aim of this study was a comparative analysis of the broiler meat quality parameters mentioned in terms of the effect of the non-industrial rearing systems used.

### Material and Method

The material at the start of this experiment consisted of 200 one-day old chickens of the line hybrid Hybro H. The fattening of the broilers lasted 56 days. In the first four weeks the rearing was conducted within the same construction with the deep floor covering. Then, at 28 days, the experimental chickens were divided into two groups. One group was reared within a closed object, in a chicken pen, at population density of 12 broilers per square meter and under the extensive production conditions in the chicken pen, according to the European Union regulations on non-industrial poultry meat production. The second group was provided with the same useful area within the closed construction, but there were outlets for these chickens, too. The outlet size was such to provide each chicken with 1 square meter of the outlet area.

The trial chickens were fed two appropriate complete fodder mixtures: the initial one (up to 28<sup>th</sup> day) and the final one (from the 28<sup>th</sup> till the 49<sup>th</sup> day of fattening). In the last week of the fattening period, the chickens diet consisted of 70 % ground corn and about 30% concentrate mixture.

Following the fattening period, 12 broilers (half males and half females) were chosen at random from each experimental group and slaughtered, with the aim of examining quantity broiler meat characteristics at the slaughter line. The chickens were manually slaughtered and de-feathered. The following data were recorded: chicken weight before slaughter, mass of processed warm carcass and mass of cold carcass. Furthermore, some major edible and non-edible slaughter products, as well as abdominal fat were weighed.

Processed and cold carcasses were, then, dissected into basic parts (breasts, thighs, drumsticks, wings, pelvis and backs). Weights of the individual basic parts mentioned were determined.

From the data obtained by these measurements, slaughter yields, the shares of basic carcass parts and abdominal fat in the weight of broilers before slaughter were weighed.

The analysis of the research data was made by using the usual variation statistics methods. The testing of the significance of differences was conducted through the following variation analysis model:

$$y_{ijk} = \mu + (P)_i + (SG)_{ij} + e_{ijk}$$

that is, the model corresponding to the two-factor experimental plan 2x2 (2 sexes and 2 systems of rearing).

### Results and Discussion

Table 1 shows values of slaughter yields in both hens and cocks in two different non-industrial ways of rearing (I group—in the outlet rearing and the II one—in the extensive chicken-pen rearing system).

From the Table 1, one can see a somewhat higher traditionally dressed carcass yield in the hens of the experimental group as compared to that in the cocks. However, both the differences between the sexes and the rearing systems studied were statistically insignificant. Higher ready to cook yield values were recorded in the hens. The difference between the sexes in view of the ready to cook carcass yield was statistically significant ( $P < 0.05$ ). However, from the point of view of oven ready carcass yield, the established differences between both the rearing systems studied and the broiler sexes were slight, i. e. non-significant.

The shares of the basic carcass parts and of abdominal fat in the hens and cocks of the rearing systems studied are presented in the Tab. 2.

Based upon the data in Table 2, it could be concluded that the outlet-reared hens had the highest (22.87%) and the extensively chicken-pen-fattened cocks the lowest (20.98 %) breast carcass share. The cocks in both rearing systems had a somewhat higher thigh share. Similar drumstick shares were found in the broilers of both experimental groups. The differences between the broilers reared in two different non-industrial systems of rearing were also slight in view of the wings, pelvis and back share. Furthermore, using the analysis of the significance of the differences between the trial broilers as regards the share of certain basic carcass parts, it was determined that the differences tested were not statistically significant ( $P > 0.05$ ).

The abdominal fat share ranged from 1.71 % in the cocks of the II trial group to 2.24 % in the hens reared in the same system of rearing. The abdominal fat share was not significantly affected by the broiler rearing systems tested and a statistically significant difference ( $P < 0.05$ ) was established in terms of the effect of the sex of the broilers examined. A significantly higher abdominal fat share was recorded in the trial hens as compared to that in the cocks.

The shares of the basic carcass parts and of abdominal fat were generally not significantly affected by sex, being in conformity with the results by Heath and Owens (1985), Masic et al. (1985), as well as by Hopic et al. (2000). Certain deviations from the results obtained as regards the literary sources resulted from the effects of the rearing systems studied (Bogosavljevic-Boskovic et al. 1996, 1997), the carcass dissection manner (Ricard 1988) and of the examined sample size (Ristic 1993).

### Conclusion

Based upon the study results mentioned, the following may be concluded:

-Slaughter yields, the basic carcass parts shares, as well as the abdominal fat share did not seem to be significantly affected by the non-industrial broiler rearing systems studied;

-The differences between the sexes in terms of the meat quality parameters mentioned, were also generally non-significant. Namely, the hens had only statistically significantly higher ( $P \leq 0.05$ ) ready to cook slaughter yield and a significantly higher abdominal fat share compared to the cocks.

### Pertinent literature

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3. Masic B., Antonijevic N., Vitorovic D., Latinovic D. (1985): Zbornik radova "ivinarski dani", Ljubljana 1985, 233-234.
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5. Ristic M. (1993): Tehnologija mesa, 2-3, 116-118.
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7. Hopic S., Pavlovski Z., Lukic M., Skrbic Z. (2000): @ivinarstvo, 1-2, 9-12.
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Table 1: Slaughter yield in carcasses of examined chicks (in % of live weight)

Trial group	Sex	Carcass mass in % of live weight		
		Traditionally dressed carcass	Ready to cook	Oven ready carcass
I	M	$\bar{x}$ 82.49 cv 1.73	76.85 2.67	70.25 5.90
	F	$\bar{x}$ 84.81 cv 1.98	79.40 1.98	72.14 2.72
II	M	$\bar{x}$ 83.78 cv 1.93	77.49 2.26	70.31 2.48
	F	$\bar{x}$ 84.25 cv 1.19	79.10 1.90	71.03 2.20

M-Males

F-Females

Table 2: Shares of basic parts and abdominal fat

Trial group	Sex	Abdominal fat	Breasts	Thighs	Drumstick	Wings	Back	Pelvis
I	M	$\bar{x}$ 1.74 cv 28.31	21.06 7.17	9.91 9.10	11.13 3.96	7.96 2.76	9.10 13.80	8.66 10.90
	F	$\bar{x}$ 2.00 cv 20.58	22.87 2.84	9.67 2.04	11.54 1.92	7.97 2.35	9.23 5.34	8.84 4.15
II	M	$\bar{x}$ 1.71 cv 11.02	20.98 1.79	10.19 2.09	11.52 3.06	7.62 3.20	9.20 6.30	8.67 3.62
	F	$\bar{x}$ 2.24 cv 12.25	21.67 4.54	9.75 1.67	11.30 2.34	8.02 4.32	8.52 3.27	8.86 5.31

M-Males

F-Females