

BROILER MEAT QUALITY CHARACTERISTICS DEPENDING ON THE WAY OF REARING

Introduction

The poultry production in the last few decades has been greatly intensified and nowadays it contains all characteristics of industrial production. Thus intensified, it has, by a large degree, put the traditional meat and eggs production to the background. Poultry products have become available at the market throughout the year in large quantities, and at rather low prices. All of these facts have influenced a very widespread thought that the intensive products are not really "healthy" and natural. Actually, the quality of such products is more and more often questioned.

Concerning this fact, the subject of the research within this topic is the analysis of broiler meat quality characteristics in two different ways of rearing (intensive, industrial and half-intensive). The aim was to realize the justification of using one kind of half-intensive broiler rearing system from the point of better quality characteristics meat production.

Material and Method of Work

The starting material in this experiment consisted of 800 one-day old chickens, hybrid line Hybro. The experiment was organized in two replicas, as the first and the second experiment. The first one was conducted in spring, and the other one in summer. Besides, broilers from growth day one to forty-nine were used in both experiments.

Broiler rearing during the first two weeks was conducted within the same construction with the deep floor covering. After that, on the fourteenth day, the chickens were divided in to two groups and displaced. One group was reared within a closed construction, with population density of 18 chickens per square metre and under the intensive production conditions. The second group was provided with the same useful area within the closed construction, but there were outlets for these chickens, that is a way of half-intensive rearing system. Population density in these conditions was 7 chickens per square metre.

In order to examine the meat quality characteristics of broilers from the first part of the experiment, 30 chickens were slaughtered from each experimental group (15 males and 15 females), chosen by accident. Prepared and cold carcasses were dissected into basic parts (breasts, thighs, drumsticks, wings, pelvis and backs). Afterwards, breasts, right thighs and right drumsticks were dissected in order to establish the rate and share of basic tissue parts (muscles, bones and skin) in better carcass parts. At the same time, muscle tissue samples were taken from the better parts mentioned, for chemical analysis.

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The analysis of the results from this research was done by using the usual variation statistics methods. The testing of important differences was conducted by using the following mathematical variation analysis model:

$$y_{ijk} = \mu + (Wr)_i + (E)_j + (WrE)_{ij} + e_{ijk}$$

that is, the model corresponding to the two-factor experiment plan 2x2 (2 ways of rearing, Wr and two experiments, E).

Research Results and Discussion

As important parameters of quality within the results achieved by this research, the share of particular meat categories in prepared chicken carcasses, the share of basic tissues in better carcass parts and the chemical structure of meat are particularly described and discussed.

The information about particular meat categories are presented in chart number 1.

CHART 1: The share of particular meat categories in prepared carcasses (%).

Experiment	Way of rearing	Meat categories			
		I	II	III	
I	In	\bar{x}	59,73	12,82	26,88
		cv	3,19	6,22	7,21
	Hi	\bar{x}	60,27	12,57	26,51
		cv	3,34	5,86	7,77
II	In	\bar{x}	59,18	12,69	27,33
		cv	2,90	5,76	5,90
	Hi	\bar{x}	60,24	12,52	26,60
		cv	3,72	8,64	6,37

In - Intensive
Hi - Half-intensive

On the basis of the information in chart 1, it can be understood that the outlet-reared broilers had a larger share of the first category meat compared to the intensive reared ones. The intensive reared broilers had a little larger share of the second and third category meat. Besides, the testing results indicated statistically very important differences to the advantage of the half-intensive reared broilers, from the point of the first category meat share. On the other hand, no significant differences were found concerning the second and the third category meat share, or the results achieved by rearing in various seasons.

For further quality evaluation, the results of dissection to basic tissues in thighs, breasts and drumsticks are discussed as relevant (chart 2).

CHART 2: The share of basic tissues in better carcass parts (%).

Experiment	Way of rearing		Basic tissues		
			Muscle	Bones	Skin
I	In	\bar{x}	65,73	23,43	9,72
	Hi	\bar{x}	67,63	22,26	8,93
II	In	\bar{x}	66,04	22,95	9,82
	Hi	\bar{x}	67,01	22,48	9,28

In - Intensive
Hi - Half-intensive

On the basis of the information in chart 2 we may state that the outlet-reared broilers had an average 1,44% larger share of muscle tissue than the intensive reared ones (this was statistically important difference). They also had 0,82%, that is 0,67% lower bone share, or skin share in the total mass of breasts, drumsticks and thighs. The differences shown between bone and skin share, as well as the ones between experiment results, were not statistically justified.

These results can be explained by the fact that the organization of broiler production in two different ways (closed, confined and dark space with the controlled microclimate on one side, and outlet rearing in natural conditions on the other), had some other differences as a consequence-those at biochemical process level, and indirectly in physiological and structural manifestations in tissues and organs.

We should point out that despite very few comparable information in literature available (for well-known influence of genetic basis, growth, and dissectional methods on carcass yield, that is, basic tissue parts and particular tissue share) the results of this research comply with the information given by Ristić (1977) and Varga (1981).

An important parameter of quality is certainly chemical structure of meat. In the chart number 3 the results of basic chemical structure examination in breasts, thighs and drumsticks muscle are presented.

By the analysis of information in chart 3 we may state that concerning better carcass part muscles half-intensive reared broilers had lower lipid contents and a little higher protein contents compared to the intensive reared ones.

The established differences in meat chemical structures may be the result of faster lipid and carbonic hydrate metabolism, as a consequence of outlet rearing specific points. That goes, primarily, for the processes in organism caused by more active usage of some muscles and body parts in order to obtain better moving function. The results of Ricardo's, (1989., who stated lower lipid contents in broilers reared in less populated areas) and Abaseikong's, (1989., without important influence of high temperatures) research also lead to such a conclusion.

CHART 3: The contents of lipids (L) and proteins (P) in better carcass parts muscles

Experiment	Way of rearing		Breasts	Drumsticks	Thighs
I	In	L	2,64	8,18	5,21
		P	22,84	18,62	20,70
	Hi	L	2,27	7,08	4,86
		P	23,55	19,21	21,75
II	In	L	2,22	8,56	5,25
		P	23,32	19,42	20,92
	Hi	L	2,04	7,45	3,86
		P	23,65	19,50	21,92

In - Intensive
Hi - Half-intensive

Conclusion

Giving a summary of research results about intensive and half-intensive ways of rearing influence on specific meat quality parameters in broilers, we may conclude that, concerning these information, half-intensive rearing was better compared to the intensive one. Actually, outlet reared broilers had a higher first category meat share, and higher share of muscle tissue in better carcass parts. Besides, these broilers had a lower lipid and higher protein content share in muscles, which points to specific nutritious and dietetic worth of this meat.

As the differences in results between the two experiments conducted in spring and summer were small and statistically unjustified, we may conclude that outlet rearing broiler production can be successfully organized in larger part of the year.

At the end, with the knowledge of the results of this research, that is concerning the established advantages in meat quality, the usage of outlet reared broiler production can be considered as scientifically and expertly justified.

LITERATURE

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