Conservation of Specific Biodiversity, a Key of Sustainable Agriculture. Case study: Gât Golaș de Transilvania Breed - Sensory Analysis of the Meat in Comparison with other Genetic Types

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Abstract

Gât Golaș de Transylvania breed (GGT) is part of Romania's genetic patrimony. Economic inequality compared to other similar genetic structures causes an unprecedented numerical decrease and breed entry into a vulnerable area. The purpose of this paper is to analyze the meat sensory qualities of the GGT breed compared to other genetic types under identical conditions of feeding and housing.

Meat sensory traits, in terms of appearance, taste, smell, consistency, softness were estimated in GGT breed, F1 hybrid with GGT and a commercial hybrid. Sensory analysis was performed on heat-cooked meat in three ways: boiled, roasted, and baked. According to results of analysis, study participants noted the special meat qualities of the GGT breed, well superior to other genetic types.

Key words: Gât Golaș de Transilvania; genetic resources conservation; meat sensory traits

1. Introduction

Gât Golaș of Transylvania poultry breed (Naked Neck - GGT) is a genetic structure of inestimable value, an essential component of national heritage. It is a resistant, early and high-quality meat breed. Unfortunately, there has been a major decline in herd as a result of the decline in her exploitation interest. Economic inequality is the main cause of the disappearance of domestic animal populations [1, 2]. Local breeds cannot compete with genetically improved structure in terms of production performance. However, certain characters, such as meat quality, can wake up the interest of a particular market segment and bring local genetic structures back to the attention of the general public.

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As is well known, the quality of meat is influenced by a number of factors such as the genetic type [3-5], diet [6], age at slaughter [4, 7], growth system (indoor, outdoor), microclimate, etc. All of these factors impart different sensory qualities to the meat.

Research in the field of sensory analysis of poultry meat is numerous, some of which have contradictory results, carried out on both the standard boiler and the local breeds. Some results may appear contradictory, most likely due to the subjectivity of sensory panel analysis. Fanatico et al. (2007) [8] indicates that the sensory panel was able to detect only a few differences between fast-growing and slow-growing chicks and between different growth systems in terms of sensory qualities of the meat. In contrast, studies conducted by Brown et al (2008) [9] have shown that the sensory panel has given a very high score to the standard broiler meat flavor compared to

organic broiler chickens. Despite these contradictions, meat sensory analysis studies are very important as they allow producers to respond to consumer requirements [8, 10], but they must be complemented by a market analysis, because sensory panel cannot be compared with the usual consumer [11]. In this context, the purpose of this paper is to analyze the meat sensory qualities of the GGT breed compared to other genetic types under identical conditions of feeding and housing.

2. Materials and methods

The research was organized in a local farm, the research material being represented by individuals belonging to the GGT breed, purchased from private breeders of the Pajura Association, F1 hybrid with GGT (with a genetic type that the company did not have was willing to state it) and commercial hybrid ROSS 308, purchased from Agroland. Populating was made with one day-old chicks, and feeding was carried out with feed purchased from the National Research and Development Institute for Animal Biology and Nutrition in Baloteşti, Ilfov County. The chickens were kept under the same feeding and housing conditions, with the free-range growth system. Slaughter was performed at the age of 56 days.

The meat was prepared within 2 hours after slaughter. Samples consisted of 60 grams of breast meat and 60 grams of deboned upper leg flesh.

Meat samples were divided into three groups, depending on heat treatment. Thus, 7 samples of meat were boiled at 100°C for 60 minutes, 7 samples were baked for 60 minutes at 180°C and the other 7 samples was roasted for 10 minutes with successive turns on both sides. This operation was repeated 3 times, after reasoning below.

For the sensory analysis we used 3 juries, each jury consisting of 7 people, and the characters considered were: appearance, taste, smell, consistency, softness. To minimize human error (subjectivity), the experiment was performed three times with three different juries at the same time in different rooms under the same conditions (temperature, white mass, large diameter and white plates). The analysis was performed under a 4-hour nutritional rest period, and before and during the experiment the jury members did not consume other foods, beverages, alcohol, or smoking.

The score for the characters taking into account was set on a scale of 5 (maximum) and 0 (minimum). These notes cannot be statistically processed, being rank variables that are only hierarchical. The only concession made was the computation of an average score per character and per group.

3. Results and discussion

The results of sensory evaluation of the meat (appearance, taste, smell, consistency, and softness) in the three variants of cooking (boiled, roasted, baked) are presented in Tables 1-3.

Table 1. Boiled samples

	Appeareance	Taste	Smell	Consistency	Softness
GGT					
J_1	3.8	3.8	3.3	3.0	3.0
J_2	3.6	3.4	3.1	3.1	3.0
J_3	3.8	3.6	3.4	3.1	3.0
F_1					
J_1	3.7	4.1	3.8	3.9	3.9
J_2	3.6	4.0	3.9	3.9	3.6
J_3	3.8	3.8	4.0	3.6	3.9
ROSS					
J_1	4.0	3.2	4.0	3.8	4.0
J_2	4.0	3.4	3.8	4.1	4.2
J_3	4.0	3.4	3.9	4.5	4.0

$J_1 – J_3$ = jury

Table 2. Roasted samples

	Appeareance	Taste	Smell	Consistency	Softness
GGT					
J_1	3.9	4.8	3.9	3.9	3.1
J_2	5.0	5.0	4.8	3.9	3.6
J_3	4.0	4.5	5.0	3.2	3.4
F_1					
J_1	5.0	5.0	4.5	4.1	3.9
J_2	4.8	5.0	4.5	4.2	3.8
J_3	4.1	4.5	4.8	3.8	4.0
ROSS					
J_1	4.5	3.6	3.8	3.9	4.0
J_2	4.2	3.8	3.9	3.6	3.9
J_3	4.2	3.9	4.1	3.8	4.0

$J_1 – J_3$ = jury

Table 3. Baked samples

	Appeareance	Taste	Smell	Consistency	Softness
GGT					
J_1	5.0	5.0	4.5	4.1	4.8
J_2	4.8	5.0	4.8	4.1	5.0
J_3	4.5	5.0	5.0	4.5	4.8
F_1					
J_1	5.0	5.0	5.0	4.5	4.8
J_2	4.8	4.5	5.0	4.5	4.8
J_3	5.0	5.0	5.0	4.5	5.0
ROSS					
J_1	4.5	4.5	3.8	4.0	4.0
J_2	5.0	4.8	3.9	4.0	4.5
J_3	5.0	4.4	3.6	4.0	4.5

$J_1 – J_3$ = jury

Following the sensory evaluation of the meat samples by the three juries, it was found that the best results were obtained from the meat samples from the GGT breed and F1, in the case of thermal preparation by roasting and baking, to the taste and smell characteristics, and in the case of the ROSS hybrid for baked meat. The small notes obtained for the taste and smell by the ROSS samples for all the thermal treatments denote the jury's preference for a meat with modest consistency and softness but with special taste qualities.

The fact that samples from the GGT breed or F1 were appreciated by the three groups of judges is a positive aspect, proving that the GGT breed has real chances to meet the requirements of a growing market segment, thus becoming economically efficient. The special taste of the meat compensates for the low growth speed, and the GGT breed can be a remarkable biological material that, alone or in a hybridization program, can contribute to the development of an „organic" product on the market.

4. Conclusions

The study revealed that using the GGT breed alone or in different hybridization schemes, it is possible to obtain a product of real qualities that can be branded and marketed, capable of satisfying a market segment willing to pay a higher price on the poultry meat. In this way, the GGT breed, with an effective marketing program, can change its risk status out of the danger or vulnerability area.

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