ASSESSMENT OFABILITIES FOR MEAT PRODUCTION FOR HALF-BREEDS RESULTING FROM THE CROSSING OF AWASSI AND TIGAIE SHEEP

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Abstract

The purpose of the research was to carry out a real analysis of the capabilities on which meat production depends on two lots consisting of individuals of the Tigaie breed and respectively of the half-breed individuals resulting from the systematic crossing of the local Tigaie sheep with Awassi rams. The importance of research results from the fact that the half-breed population considered is in the seventh generation and is reproductively closed to fix the characters on which milk production depends. Since, in expressing the efficiency of the management system applied in sheep breeding, milk and meat contribute to about 82% of the achieved results, can also be a mark in the development of an improvement program that includes in its objectives also meat production.

The biologic material subjected to fattening and subsequently to planned assessments, was made up of the youth of this year, males and females, and the fattening applied was semi intensive and had a total duration of 140 days with the following technological phases: accommodation (10 days), breeding and fattening (90 days) and finishing (40 days).

The statistical data processing revealed that the difference between the two lots was insignificant for the carcass weight, significant for $p \leq 0.05$ for live weight and distinctly significant for $p \geq 0.01$ for the average yields at slaughter.

When assessing the quality of the carcases, it was found that at the group formed from fattened youth belonging to the new sheep population (AWxTi) at a higher proportion were satisfied the requirements for the R class, while 60.66% of the Tigaie lambs expressed the requirements for the same class and only about 20% fulfilled the requirements for the U class.

Based on the data obtained, it can be stated that in order to fix the final morphological type of the new sheep population it is necessary to include among the breeding selection objectives the characters on which meat production depends.

Key words: Awassi, Tigaie, sheep meat, genetic improvement, sheep carcasses

INTRODUCTION

The main purpose of the research was to obtain objective information about the potential for meat production, from a new biological creation formed by the systematic crossing of local Tigaie sheep with genres belonging to the Awassi breed. Planning this type of research is opportune even if the purpose of forming the respective population was represented by milk production. Knowing the peculiarities or characteristics on which meat production depends, is an important lever to guide the growth and fattening process of reformed adult breeds, or surplus of lambs with direct effect on the economic efficiency of sheep breeding of the new type.

The purpose of this research also derives from the fact that as a newly formed population, the values specific to the main characters on which meat production depends are unknown.

In order to obtain tangible data on the particularities specific to the growth and

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fattening process in this new sheep population, several studies, analyses and determinations have been carried out. All these activities were intended to provide relevant data that were subsequently used in:

- elaboration and experimentation of the technological model of production and evaluation of meat production;
- evaluation of the fattening degree;
- assessment of skills for meat production on living animals;
- assessment of skills for meat production on the slaughtered animal.

MATERIAL AND WORK METHOD

The biological material was represented by the youth categories of males and females from the current year which was subjected to a process of breeding and fattening. The total fattening time was of 140 days and included three technological phases: accommodation (10 days), breeding and fattening (90 days) and finishing (40 days).

Working methods were specific, choosing those that can give a higher degree of accuracy to the parameters considered. The technology applied at fattening, as well as maintenance conditions and feeding standard were the same for both batches and the fattening took place during the same season and had a total duration of 140 days.

The estimation of the degree of fattening on the slaughtered animal was based on determinations of the carcass weight, carcass dimensions and indices, as well as the yield at slaughter. At the assessment of the degree of fattening and the conformation of carcases, were used requirements specified by the European classification system [3].

The achieved result have been input into the data base, used to run statistical analysis with the algorithm REML (REstricted Maximum Likelihood), which provide the achievements of the statistical parametric estimators within the normal range. The REML estimator is the maximum likelihood estimate of the parameters which uses only the information not contained in the estimate of the regression vector, and thereby automatically corrects for the degrees of freedom which are lost in estimating the regression vector.

RESULTS AND DISCUSSIONS

Since the stated purpose of the research was to assess the potential for meat production at the end of the fattening process, 6 individuals were sacrificed from each batch. To avoid the influence of various factors on the final results, the slaughtered individuals were randomly nominated, of which three males and three females were sacrificed from each batch.

Slaughter yield is an extremely important indicator in the appreciation of meat production. It is influenced by a large range of factors, of which nutrition is the most important along with the fattening technology applied. In order to limit their influence in research, the diet was unitary as well as the fattening technology applied. With regard to this latter aspect, many authors cite lower values of slaughter yields in the case of fattening young sheep on the basis of volume feed [Boikovski, et al., 1979 cited by Pascal 2015]; [1, 2, 7]; [Dinescu, 1974 cited by Pascal 2004].

From the technical point of view, the value of this indicator differs according to the breed, fattening status, age, individual, etc., but they present close values within the group of common gene-fund animals and breed under identical conditions. The certainty of establishing this index may be influenced in particular by the size of the gastrointestinal content of the animals for slaughter [5]. To eradicate the errors, before slaughter, the fattened lambs were subjected to a 24-hour fast, during which the gastrointestinal content was eliminated.

In the researches performed it was found that between the two lots there is an obvious differentiation for the characters on which the scarification efficiency is determined. Although the live weight at slaughter, in the case of the lot of individuals of the new population, was higher with 1.380 kg by the fact that the parts of the carcass which were not included in the yield had a higher weight by 270 g, the final yield value is reduced with 2.7% compared to the level of the same indicator determined for the Tigaie breed.

The assessment based on the analysis of the carcass-specific indices shows that in the case of pure Tigaie lambs is found a better

ratio between the carcass width at the leg of mutton and the back length of the carcass. This aspect shows that from the point of view of the conformation in the Tigaie breed the basic characters are better expressed, favouring a better development of the muscular masses in the essential parts.

Table 1 The average values obtained in the objective evaluation of the degree of fattening

Appreciated characters	Tigaie		New type of population Aw x Ti	
	$\overline{X} \pm s_{\overline{X}}$	V%	$\overline{X} \pm s_{\overline{X}}$	V%
Live weight	32.750 ± 0.378	3.29	34.130 ± 0885	5.52
Carcass weight	15.380 ± 0.271	4.80	15.110 ± 0.443	7.67
Slaughter yield	46.960 ± 0.803	4.78	44.271 ± 0.429	2.28
Long carcass length	64.250 ± 0.832	3.6	66.710 ± 0.749	3.1
Small carcass length	62.860 ± 0.510	2.3	64.850 ± 0.875	2.7
Leg of mutton length	27.180 ± 6.260	6.5	26.420 ± 0.710	5.4
The large perimeter of the leg of mutton	23.120 ± 0.623	7.6	22.420 ± 0.526	4.7
The small perimeter of the leg of mutton	21.540 ± 0.450	5.9	17.210 ± 0.335	3.9
The width of the carcass at the leg of mutton	22.870 ± 0.283	3.8	17.500 ± 0.332	3.8
The width of the casing to the chest	22.560 ± 0.224	2.8	16.140 ± 0.347	4.3
Thoracic depth	22.430 ± 0.254	3.2	18.020 ± 0.351	3.9
Depth of the basin	22.560 ± 0.296	3.8	16.640 ±0.382	4.6
Carcass format index	101.06	-	108.4	-
Index of the leg of mutton development	117.56	-	117.84	-
Carcass width index	101.37	-	108.42	-
The difference and the significance of the difference for the main indicators				
Indicator	Difference ±	Statistical significance of the difference		
Live weight	1.38^{*}	*Significant at the 0.05 level (w = 1.01); **Significant at the 0.01 level (w = 1.55); $^{n.s.}$: not significant		
Carcass weight	0.27^{ns}			
Slaughter yield	2.69^{**}			

Statistical data processing indicates the existence of different meanings between the main indicators that characterize meat production (table 1). Thus, between the two lots, the difference was insignificant for the carcass weight it was significant for $p \leq 0.05$ for the live weight and distinctly significant for $p \geq 0.01$ for the mean values determined for the slaughter yield.

The carcass width index expresses the existence of a more favourable ratio for the Tigaie lamb carcasses between the width dimensions determined at the chest and the leg of mutton.

The development index of the leg of mutton has in both cases extremely close values, indicating a good proportionality of this butchery region and a favourable ratio between perimeters and length, facilitating a good development of the muscular masses, especially in the upper region.

The assessment of carcass quality and conformation is an important activity carried out at the end of each productive cycle. The assessment of the quality and conformation of the carcasses was carried out in relation to the methodology applied at European level. For objectivity of information, the assessment took into account the conformation of the carcase and the degree of fattening found at the time when the fattening ended.

The carcass conformation assessment was carried out on those obtained from the control of the slaughtering, aiming at the appreciation of the degree of development of muscle mass in relation to the profile recorded at the posterior side, middle and frontal.

Appraisals indicate that in the case of batches there were reported situations where the outside of the carcasses had obvious differences in the essential areas. This aspect was important for the classification that was made to assess the conformation. In this case, it was found that in the batch consisting of fattened youth belonging to the new sheep population (AWxTi), a higher proportion of the total carcasses analysed implied the requirements of entering the R class, while 60.66% of the lambs from the Tigaie breed showed requirements for entering the same class, and about 20% fulfilled the class U requirements, aspects easy to highlight also in the images shown in fig. 1.

Fig. 1. Youth fattened carcasses
(left Aw x Ti and right of Ti)

The evaluation of carcasses by the degree of fattening was made based on the analysis of fat distribution on the internal and external parts of the carcase and the results obtained are presented in table 2. Regarding the fat distribution on the external surface of the carcasses, it was found that, while at the local breed the tissue of suet was thicker on the upper line and in the posterior area, the carcases obtained by sacrificing the individuals from the new population showed a flattening of the fat layer and a thinner layer dispersion on the external surface of the carcass.

On the basis of the observations it appears that at Tigaie the degree of fattening was more obvious because the proportion of carcases that met the minimum requirements for classification in class 4 was 50%, and for those resulting from the fattening of individuals from the new population, the majority were classified in the third class, respectively 50%.

Table 2 Classification of carcases according to E.U. standards

Category	Genotype	
	Tigaie	AW x Ti
after conformation (%)		
S	-	-
E	-	-
U	19.67	-
R	60.66	50.00
O	19.67	33.33
P	-	16.77
after fattening degree (%)		
1	-	-
2	16.67	25.00
3	33.33	50.00
4	50.00	25.00
5	-	-

Compared with other scientific data quoted for the same breeds or for other local populations [8, 4] the obtained results demonstrated the limited possibilities of the two batches to produce high quality carcasses.

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CONCLUSIONS

1. In the analysis of the main indicators on the basis of which the meat production was evaluated, the difference between the two batches was insignificant for the carcass weight it was significant for $p \leq 0.05$ for the live weight and distinctly significant for $p \geq 0.01$ for the average values determined for the yield at slaughter

2. The conformity assessment shows that in the batch of fattened youth belonging to the new sheep population the highest proportion expressed the requirements for classification in the R class, while 60.66% of the Tigaie lambs expressed the requirements of the same class and only 20% fulfilled the conditions for classification in a higher class, respectively U.

3. In assessing the degree of fattening in relation to the presence of the fat layer it is found that the fattening of the Tigaie lambs was more obvious as the proportion of the carcases which met the minimum requirements for classification in class 4 was 50%, and most of those resulting from the fattening of the individuals from the new population were classified in the third class, respectively 50%.

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