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RESEARCH REGARDING THE SLAUGHTERING OUTPUT, TISSUE STRUCTURE AND THE QUALITY OF THE CARCASSES AT THE HYBRID LAMBS FOR MEAT COMPARATIVELY TO THEIR CONTEMPORARIES FROM THE PARENTAL BREEDS

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Abstract

The present work aims to present the superiority of the hybrid lambs for meat regarding the slaughtering output, the tissue structure and the quality of the carcasses, comparatively to their with contemporaries from the parental breeds. The research was made on lambs fattened until the living weight 40 kg/head from the breeds of Palas Merino, Palas Meat Breed and F1 hybrids of Palas Meat Breed x Palas Merino and F1 Suffolk x Palas Merino. The highest slaughtering output was that of the F1 hybrids Suffolk x Palas Merino, out of them R1 having the value of 51,21 % and R2 of 55,94 % besides 44,25 % and respectively 49,54 % at the contemporaries of Palas Merino. Also, these hybrids had also the best carcasses, being categorized by conformation in U class (very good carcasses) and by fattening degree in the 3rd class 3 (medium fat carcasses).

Key words*: hybrid, slaughtering output, carcass.*

INTRODUCTION

In Romania the meat of youth sheep is produced through fattening the lambs from the breeds of Merino, Tsigaie and Tsurcana and less through producing and fattening meat hybrid lambs.
Less research was made regarding the slaughtering output, the tissue structure and the quality of the carcasses at the local sheep breeds and at the hybrids with the meat breeds (Ciolcă et al., 1973; Vicovan, 2008; Vicovan, 2009).
This paperwork aims to show and to promote the superiority of the hybrids comparatively to their contemporaries from the three Romanian breeds, regarding the slaughtering output and the quality of their carcasses.

MATERIALS AND METHODS

The research was made on young male sheep that have been fattened until the living weight of 40 kg/head, from Palas Merino Breed, Meat Breed Palas, F_1 hybrids of Meat Breed Palas x Palas Merino and F_1 Suffolk x Palas Merino.
From each breed and crossbreeding variant three exemplars were slaughtered.
The slaughtering output was calculated through two methods as follows:

- Output1 (R_1) by reporting the weight of the cooled carcass to the living weight before slaughtering;
- Output2 (R_2) by reporting the weight of the cooled carcass to the empty living weight, which results after from the living weight it was subtracted the content of the digestive tube.

The tissue structure of the carcasses was determined by the dissection of the right semi-carcass (separation of the muscles from bones and from the intramuscular covering fat).
The appreciation of the quality of the carcasses was made by conformation and the degree of fattening through comparison with the European grid of classification of the carcasses (S.E.U.R.O.P).
All data was processed and statistically interpreted through the Fisher test (Snedecor, 1968).

RESULTS AND DISCUSSIONS

Table 1 is presenting the slaughtering output at the lambs from the 2 breeds and at the studied hybrids for meat.

Table 1. The values of the slaughtering output at the hybrid lambs comparatively to their contemporaries from Palas Merino breed and Palas Meat Breed

Breed/ Hybrid	The slaughtering output (%)					
	R_1			R_2		
	n	X ± sx	V%	n	X ± sx	V%
Palas Merino	3	44.25 ± 0.8290	3.21	3	49.54 ± 1.3700	4.79
Meat Breed - Palas	3	47.54 ± 0.5100	1.85	3	53.98 ± 0.4700	1.51
F_1Meat Breed - Palas x Palas Merino	3	48.12 ± 0.4988	1.79	3	54.74 ± 1.1800	3.74
F_1 Suffolk X Palas Merino	3	51.21 ± 1.2280	4.12	3	55.94 ± 0.9100	2.83

It is noted that the Palas Merino had the lowest values of the slaughtering output, these being 44.25% for R1 and 49.54% for R1 and R2, followed by the Palas Breed Meat with 47.54% respectively 53.98% (Table 1).

The hybrid F_1 Meat Breed Palas x Palas Merino values were 48.12% to 54.74% for R1 and R2, and the highest values being for F1 hybrid Suffolk x Palas Merino with 51.21% and respectively 55.94%.

Table 2 (a.b) is presenting the differentiation of slaughtering output between genotypes, are shown the differences of R1 and R2 related to the F1 hybrid between Meat Breed Palas x Palas Merino as compared to PalasMerino and Meat Breed Palas. It also shows the values of R1 and R2 in the Meat Breed Palas from the Palas Merino and Hybrid F1 Suffolk X Palas Merino compared with PalasMerino and Hybrid F1 Meat Breed Palas x PalasMerino.

It can be noticed that there were significant differences ($p< 0,05$) both between F1 Meat Breed Palas x Palas Merino and Palas Merino and also between Meat Breed Palas and Palas Merino, but also between F_1 Suffolk x Palas Merino and Palas Merino (Table 2). Between the two hybrids the differences were insignificant ($p> 0.05$).

Table 2a. Differentiation of slaughtering output

Differences between	Output 1 (R_1)	
	Percent points	Significance of differences
F_1Meat Breed – Palasx Palas Merinoand Palas Merino	+ 3.87	p< 0.05
F_1Meat Breed – Palasx Palas Merino and Meat Breed - Palas	+ 0.58	p> 0.05
Meat Breed – Palasand Palas Merino	+ 3.29	p< 0.05
F_1 Suffolk x Palas Merinoand Palas Merino	+ 6.96	p< 0.05
F_1 Suffolk x Palas Merinoand F_1Meat Breed – Palasx Palas Merino	- 3.09	p> 0.05

Table 2b. Differentiation of slaughtering output 1.

Differences between	Output 2 (R_2)	
	Percent points	Significance of differences
F_1Meat Breed – Palasx Palas Merino and Palas Merino	+ 5.20	p< 0.05
F_1Meat Breed – Palas x Palas Merino and Meat Breed - Palas	+ 0.76	p>0.05
Meat Breed – Palasand Palas Merino	+ 4.44	p< 0.05
F_1 Suffolk x Palas Merinoand Palas Merino	+ 6.40	p< 0.05
F_1 Suffolk x Palas Merinoand F_1Meat Breed – Palasx Palas Merino	- 1.20	p> 0.05

Table 3 is presenting the tissue structure of the carcasses at Palas Merino, Meat Breed Palas and the two hybrids.

Table 3a. The tissue structure of the carcasses at the lambs that had been experimentally slaughtered

Breed /hybrid		Tissue Structure (%)	
		muscles	bones
Palas Merino	n	3	3
	X ± sx	60.77 ± 2.0800	23.32±1.0200
	V%	5.85	7.57
Meat Breed - Palas	n	3	3
	X ± sx	64.34±0.6700	21.69±1.1700
	V%	1.80	9.35
F_1Meat Breed - Palas x Palas Merino	n	3	3
	X ± sx	62.03±0.0156	21.31±0.6300
	V%	4.37	5.14
F_1 Suffolk x Palas Merino	n	3	3
	X ± sx	59.13±1.4100	22.45±0.5100
	V%	4.12	3.95

Table 3b. The tissue structure of the carcasses at the lambs that had been experimentally slaughtered

Breed /hybrid		Tissue Structure (%)	
		fat	meat*
Palas Merino	n	3	3
	X ± sx	15.95±2.8700	76.71±0.9900
	V%	31.17	2.24
Meat Breed - Palas	n	3	3
	X ± sx	14.20±0.5000	78.53±0.9600
	V%	6.07	2.11
F_1Meat Breed - Palas x Palas Merino	n	3	3
	X ± sx	16.70±1.9800	78.73±0.6500
	V%	20.56	1.43
F_1 Suffolk x Palas Merino	n	3	3
	X ± sx	18.45±1.8100	77.59±0.5100
	V%	17.02	1.13

* The meat is considered as muscles together with the covering and inter-muscle fat

It can be noticed that the proportion of the muscles in the carcass was between the limits of 59.13% at F_1 Suffolk x Palas Merino and 64.34% at Meat Breed –Palas, with 60.77% at Palas Merino and 62.03% at F_1 Meat Breed - Palas x Palas Merino.

The proportion of bones was between the limits of 21.31% at F_1 Meat Breed - Palas x Palas Merino and 23.32% at Palas Merino, with 21.69% at Meat Breed –Palas and 22.45% at F_1 Suffolk x Palas Merino.

The fat was between the limits of 14.20%at Meat Breed - Palas and 18.45% at F_1 Suffolk x Palas Merino, with 15.95% at Palas Merino and 16.70% at F_1 Meat Breed - Palas x Palas Merino.

The meat was in proportion of 76.71% at Palas Merino, 77.59% at F_1 Suffolk x Palas Merino, 78.53% at Meat Breed - Palas and 78.73% at F_1 Meat Breed - Palas x Palas Merino.

Doing the tests of significance of the differences for the five combinations between the 2 breeds and the two hybrids regarding the proportion of muscles, bones, fat and meat, all the differences were insignificant ($p > 0.05$).

Table 4 is presenting the classification of the carcasses after SEUROP grid.

The results are showing that at the hybrids of F_1 Suffolk x Palas Merino all carcasses were in U class by conformation (very good carcasses) and by the fattening degree in the 3rd class (medium fat carcasses).

The carcasses of F_1 Meat Breed Palas x Palas Merino hybrid were classified by conformation in a proportion of 67% in U class (very good carcasses) and 33% in R class (good carcasses), and by the fattening degree in the 2nd class (week carcasses).

At the Meat Breed of Palas all carcasses were from U class by conformation and by the fattening degree 33 % were in the 2nd class (weak carcasses) and 67 % in the 3rd class (medium fat carcasses).

The carcasses from PalasMerinos totally correspond by conformation to R class (good carcasses) and by the degree of fattening, 33% were from the 2nd class and 67 % from the 3rd class (Table 4).

Table 4a. Classification of the carcasses after EUROP grid, at the hybrids for meat comparatively to their contemporaries of Palas Merino and Meat Breed Palas

Specification	Class by conformation			
	U (very good carcasses)		R (good carcasses)	
	no.	%	no.	%
F_1 Suffolk x Palas Merino	3	100.0	-	-
F_1Meat Breed – Palasx Palas Merino	2	67.0	1	33.0
Meat Breed - Palas	3	100.0	-	-
Palas Merino	-	-	3	100.0

Table 4b. Classification of the carcasses after EUROP grid, at the hybrids for meat comparatively to their contemporaries of Palas Merino and Meat Breed Palas

Specification	Class by the fattening degree			
	2 (weak carcasses)		3 (medium fat carcasses)	
	no.	%	no.	%
F_1 Suffolk x Palas Merino	-	-	3	100.0
F_1Meat Breed – Palas x Palas Merino	1	33.0	2	67.0
Meat Breed - Palas	1	33.0	2	67.0
Palas Merino	1	33.0	2	67.0

CONCLUSIONS

The Palas Merino had the lowest values of the slaughtering output, these being 44.25% for R1 and 49.54% for R1 and R2, followed by the Palas Breed Meat with 47.54% respectively 53.98%.

The hybrid F_1 Meat Breed Palas x PalasMerino values were 48.12% to 54.74% for R1 and R2, and the highest values being for F1 hybrid Suffolk x Palas Merino with 51.21% and respectively 55.94%.

The differentiation of slaughtering output between genotypesare shown the differences of R1 and R2 related to the F1 hybrid between Meat Breed Palas x PalasMerino as compared to PalasMerino and Meat Breed Palas. It also shows the values of R1 and R2 in the Meat Breed Palas from the PalasMerino and Hybrid F1 Suffolk X Palas Merino compared with PalasMerino and Hybrid F1 Meat Breed Palas x PalasMerino.

There were significant differences ($p<0.05$) both between F1 Meat Breed Palas x Palas Merino and Palas Merino and also between Meat Breed Palas and Palas Merino, but also between F_1 Suffolk X Palas Merino and Palas Merino. Between the two hybrids the differences were insignificant ($p>0.05$).

The proportion of the muscles in the carcass was between the limits of 59.13% at F_1 Suffolk x Palas Merino and 64.34% at Meat Breed –Palas, the proportion of bones was between the limits of 21.31% at F_1 Meat Breed-Palas x Palas Merino and 23.32% at Palas Merino. The fat was between the limits of 14.20% at Meat Breed-Palas and 18.45% at F_1 Suffolk x Palas Merino. The meat was in proportion of 76.71% at Palas Merino, 77.59% at F_1 Suffolk x Palas Merino, 78.53% at Meat Breed - Palas and 78.73% at F_1 Meat Breed - Palas x Palas Merino.

Doing the tests of significance of the differences for the five combinations between the 2 breeds and the two hybrids regarding the proportion of muscles, bones, fat and meat, all the differences were insignificant ($p>0,05$).

At the hybrids of F_1 Suffolk x Palas Merino all carcasses were in U class by conformation (very good carcasses) and by the fattening degree in the 3rd class (medium fat carcasses).

The carcasses of F_1Meat Breed Palas x Palas Merino hybrid were classified by conformation in a proportion of 67% in U class (very good carcasses) and 33% in R class (good carcasses), and by the fattening degree in the 2nd class (week carcasses).

At the Meat Breed of Palas all carcasses were from U class by conformation and by the fattening degree 33% were in the 2nd class (weak carcasses) and 67% in the 3rd class (medium fat carcasses).

The carcasses from Palas Merinos totally correspond by conformation to R class (good carcasses) and by the degree of fattening, 33% were from the 2nd class and 67 % from the 3rd class.

From the presented data it certainly results the superiority of the hybrid lambs obtained through the crossbreeding the breed of Palas Merino with two meat breeds, comparatively to the lambs of Palas Merino, regarding the output at slaughtering and the quality of the carcasses.

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