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RESEARCH ON FATTENING PERFORMANCE OF HYBRID LAMBS OBTAINED FROM CROSSING PALAS MERINO WITH SPECIALIZED MEAT BREEDS

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Abstract

In the conditions of the orientation for meat production of sheep breeding in Romania, the meat production performance of hybrid lambs obtained from 2 crossbreeding variants Palas Meat Breed x Palas Merino and Suffolk x Palas Merino were studied at ICDCOC Palas Constanța and a private farm. The research carried out on 80 lambs (40 hybrids and 40 Palas Merino) subjected to fattening aimed to increase the productive performance of hybrid lambs expressed through growth rate, feed conversion into growth gain and carcass quality obtained from experimental slaughter. The results obtained revealed that hybrid lambs achieved significantly higher weight gains ($p<0.001$) compared to Palas Merino lambs (328 g in hybrids with the Palas Meat Breed and 280.84 g in hybrids with Suffolk), better conversion of nutrients into growth gain and higher carcass quality indices compared to the maternal breed, respectively the leg of mutton muscularity index by 34.46% and the leg of mutton compactness index by 34.78% higher in hybrids with the Meat breed and by 21.64% muscularity index and 30.29% leg of mutton compactness in hybrids with Suffolk.

Key words*: cross breeding, fattening, lamb meat.*

INTRODUCTION

The economic changes that have taken place in Romania and the evolution of the population's culinary preferences in the last 30 years have also greatly influenced the sheep farming sector. The new socio-economic situation of integration into the EU structure has determined the reorientation of the directions of breeding mixed breeds of sheep, raised for wool, milk and meat, towards one of these productions, as the main production. In this context, the international crisis had the strongest impact on the chain of production and valorisation of sheep wool.

Doyle et al., in 2021, show that on an international scale wool production has a low trade according to IWTO data, 2019-Textile Exchange. Wool production accounts for approximately 1% of the global supply of textile fibres. In the last 20 years, wool production has more than halved

while man-made fibre production has doubled (IWTO, 2019). As a result, along with the decrease in wool production, there was also a decrease in demand for wool factories in the last two decades. For these reasons, countries where sheep breeding is done in a traditional system, focused on wool production, have made considerable efforts to reorient their sheep breeding from wool to meat or other combinations.

Almost every country pays attention to the production of lambs that are capitalized on the domestic or foreign market, using either domestic specialized breeds or the system of crosses between two or more breeds for the production of meat lambs (Dickerson, 1973, 1969).

It is known that lamb performance at slaughter weight varies with genotype, sex, fattening status and age (Korman, 2001; Martyinuk et al., 2001). From the simple combination and crossing of two breeds, all the lambs could be fattened, and they could be heavier at slaughter due to the manifestation of the phenomenon of heterozys (Suess et al., 2000; Zupp, 2003).

Results of crossing Merino ewes with Ile de France, Black-headed German and Texel rams demonstrated that F1 hybrid lambs from all crosses achieved greater weight gain compared to Merino with 6.2% for hybrids with Ile de France, 7.8% for hybrids with German Black Head and with 8.8% for hybrids with the Texel breed (Osekowski & Borys, 1976). The results are similar to those published by other authors who studied the chemical composition and nutritional values of meat from hybrid lambs of the local Pomeranian breed with Blackheaded and Texel, finding in the hybrids a higher content of proteins, exogenous amino acids and collagen, a lower cholesterol content, a lower water absorption, a greater physiological maturity, and a larger diameter of muscle fibres (Brzostowski & Tanski, 2006; Brzostowski et al., 2004).

There is scientific information that shows that in crosses between races, biosynthetic processes are significantly influenced, which are manifested by increased activity of mitochondria, more intense metabolic processes and a greater activity of enzymes. Thus, experimental studies reveal that the activity of the enzyme aspartate-aminotransferase in hybrid lambs was higher on average by 19.8% and the enzyme alanine-aminotransferase higher by 16.4%. The mentioned conclusion is that there is a direct link between the activity level of the two enzymes and the average daily gain of the lambs (Sanikov et al., 1981).

Summarizing the results of the research carried out on Hungarian Merino sheep crossed with Suffolk and Ile de France rams and analysing the fattening performance of the hybrid lambs from the two crossing variants, it was found that the two meat breeds determined better results of the hybrids regarding conformation, covering fat and carcass tissue composition compared to Hungarian Merino lambs where the results were less favourable (Pajor, 2009). The obtained results were recommended for practice, so that the two meat breeds can be used in Hungary for the faster production of meat lambs, weighing more than 30 kg.

In Romania, among the existing autochthonous breeds, the Palas Merino breed shows the best aptitudes for meat production, considerations for which it was studied in the context of the production of hybrid meat lambs by crossing with other specialized breeds.

MATERIALS AND METHODS

The research was conducted at the Research and Development Institute for Sheep and Goat Breeding Palas - Constanta (ICDCOC Palas, Constanta) and at an individual sheep breeding farm in Constanta County (Vadu locality).

In each farm, 2 batches of 20 lambs were established, batch 1-control being represented by lambs of the maternal breed, Palas Merino (batch 1 - ICDCOC Merino, batch 1 - Vadu Merino). The two experimental batches, operated under the same conditions as the lambs in the control batches, were made up of F_1 hybrid lambs of Palas Merino ewes with Palas Meat Breed rams, at ICDCOC Palas, Constanta (batch 2 Palas Meat x Merino in Figure 1) and Suffolk rams at the individual farm (batch 2 Sufflolk x Merino in Figure 2).

Figure 1. Experimental batch 2
Palas Meat x Merino (original)

Figure 2. Experimental batch 2
Sufflolk x Merino (original)

The Palas Meat Breed is a new breed, specialized for meat, created at ICDCOC Palas - Constanta and homologated as a new breed in 2012. The Palas Meat Breed is a breed formed in Romania by crossing Palas Merino ewes with

Ile de France rams, it being better adapted to the environmental conditions in the country.

The two batches of lambs, one experimental consisting of hybrid lambs and the other control with Merino lambs, from the same location, were homogeneous in terms of age and body weight at the beginning of the experiment. The duration of the fattening period was 68 days at ICDCOC Palas - Constanța and 64 days at the Vadu individual farm.

The hybrid lambs obtained in the two crossbreeding variants were introduced for fattening, after weaning, at different ages and weights, the lactation period being 53 days at ICDCOC Palas and 78 days at the individual farm. As a result, the weights of the lambs in the experimental and control groups, at the time of introduction for fattening, were different between the two locations.

For fattening lambs from both locations, a combined feed, administered *ad libitum*, and alfalfa hay, administered in an amount of 300 g per day, was used. Thus, the share of cultivated concentrates (corn, wheat, bran) was 68.7%, the share of meal 15.5%, of fibrous fodder (alfalfa, beet cuttings) 10% and of vitamino-mineral supplements 5.8%.

The energy value of the feed was 2570 kcal/kg metabolizable energy and the protein value was 16% PBD.

An experiment was organized on these lots to test the fattening performance of hybrid lambs, compared to the maternal breed, and the following works were performed:

- Individual weighing, with the livestock scale, to establish the growth dynamics during the fattening period;
- Establishment of daily feed intake (energy and protein substances) and recording of unconsumed residues;
- Body measurements and establishment of body indices in Merino lambs and F_1 hybrids;

Length measurements were made with a zoom meter, depth measurements (width) were made with a compass, and perimeters were measured with a tape measure;

- Performing experimental slaughters and determining the slaughter yield, carcass quality indices;
- Establishing the weight of the carcass components (gigot, forelimb, carcass remainder) and the tissue weight (muscle, bone, fat) of the F_1 hybrid lamb carcasses compared to Merino lambs.

The differentiation between the Merino breed and the hybrids with the two meat breeds was done by statistical interpretation of the data obtained and establishing the differences using the Fisher test (Snedecor, 1965).

The following indicators were determined:

$$\text{Gigot's compactness index (CIG)} = \frac{\text{Width of coxofemural joints}}{\text{Lenght of gigot}} \times 100;$$

(Laville et al., 2002)

$$\text{Gigot's muscularity index (MIG)} = \frac{\text{Perimeter of gigot}}{\text{Lenght of gigot}} \times 100;$$

(Vicovan, 2014, unpublished data)

$$\text{Carcass compactness index (CCI)} = \frac{l}{K} \times 100 = \frac{\text{Width at the coxofemural joints}}{\text{Lenght of carcass}} \times 100;$$

$$\text{Thigh muscularity index (MIT)} = \frac{G}{L} \times 100 = \frac{\text{Weight of the thigh muscles}}{\text{Lenght of femur}} \times 100;$$

(Laville et al., 2002)

$$\text{Slaughter yield} = \frac{\text{Cooled carcass weight (kg)}}{\text{Live weight (kg/head)}} \times 100;$$

$$\text{Yield at empty live weight} = \frac{\text{Chilled carcass weight (kg)}}{\text{Empty live weight *}} \times 100$$

*Empty live weight from which the gastrointestinal mass has been subtracted.

At the end of fattening, three lambs from each batch were selected for experimental slaughter and carcass quality indices. To mention that the fattened lambs of the Merino and Merino x Suffolk breeds were selected by the owner of the Vadu farm, from those with the lowest body development, the rest being stopped for reproduction. The slaughter yield was determined, carcass quality indices were established, and the tissue structure of the carcasses of hybrid lambs was compared with Merino lambs. The determinations regarding the tissue structure of the carcass were made by analysing the right half of the carcass.

RESULTS AND DISCUSSIONS

At the end of the fattening period, measurements were made that allowed the assessment of the performance achieved by the hybrid lambs during fattening, the conversion of feed into growth gain and the differences between growth gains, values presented in Table 1.

Table 1. Growth performance and specific nutrient consumption

Specification	Batch ICDCOC		Batch Vadu	
	L2–Palas Meat Breed x Merino	L1 - Palas Merino	L2 - Suffolk x Merino	L1 Merino
	X ±sx	X ±sx	X ±sx	X ±sx
Initial weight (kg)	18.05±0.8660	19.52±0.671	26.18±0.5404	26.16±0.1331
Final weight (kg)	40.33±1.1201	37.53±1.2073	44.07±0.8513	40.15±0.6066
Average daily grain (g)	328±9	264.80± 12	280.84±13	220.58±9
Specific consumption of nutrients				
Dry Matter (kg)	3.89	4.65	4.48	5.62
Energy (UN)	4.84	5.85	5.62	7.02
Digestible Crude Protein (g)	732	845	840	1051
Growth gain /kg SU (g)	258.26	215.28	222.88	177.88
Differences in growth rate of F_1 hybrids compared to Merino				
Hybrids	Grams	%	The meaning of the differences	
F_1 Palas Meat bread x Merino	+ 63.20	+ 23.86	p <0.001 Very significant	
F_1 Suffolk x Merino	+ 60.26	+ 27.31	P <0.001 Very significant	

The data in the table show that the lambs from the two crossbreeds achieved greater weight gain compared to the Merino lambs. The increase in growth achieved by the hybrids with the Palas Meat Breed was 328±9 g compared to 264.8±12 as achieved by the Palas Merino lambs, the difference between the gains being statistically very significant. And the hybrid lambs with the Suffolk breed achieved a growth increase of 280.84±13 g, compared to 220.58±9 g in the Merino lambs, the differences being very significant in favour of the hybrid lambs. Although specialized works (Pajor et al, 2009; Vicovan et al, 2009) report weight gain increases of over 300 g in Suffolk and Merino hybrids, in the present study the lower values obtained were determined by environmental factors, respectively the high temperatures during the summer, over 30°C, which negatively influenced the feed consumption and growth intensity of these hybrids.

The analysis of feed conversion data reveals the favourable effect that the two meat breeds crossed with Palas Merino sheep had on the hybrid lambs. The two meat breeds favourably influenced feed conversion into growth gain, hybrid lambs from both crossbreeds achieved a kilogram of weight gain with a lower consumption of feed, energy and protein compared to the Merino lambs.

F_1 hybrid lambs with the Palas Meat Breed achieved a kg increase in weight with a consumption of 3.89 kg of dry matter, 4.84 Nutritive Units and 732 g of digestible crude protein, lower consumption by 19.5% for dry matter, 20.86% for energy and 15.43 % for protein compared to Merino lambs. Suffolk hybrid lambs achieved a kilogram of weight

gain with a consumption of 4.48 kg of dry matter, 5.62 Nutrient Units and 840 g of digestible crude protein, lower consumption compared to Merino lambs, with 25.44% for dry matter, 24.24% for energy and 25.1% for protein. The increase in growth deposited following the ingestion of one kg of dry matter in hybrid lambs with the Palas Meat Breed was 258.26 g, higher by 42.98 g compared to the increase deposited by Palas Merino lambs, of 215.28 g Suffolk x Merino hybrid lambs gained 222.88 g per kg of dry matter, and Merino control lambs gained 177.88 g. The data on weight gain intensity and feed conversion into growth gain show that using the two meat breeds to obtain hybrid lambs with the Merino breed can be a solution for producing lambs intended for meat production.

In order to see the effect of the two meat breeds on the body development of hybrid lambs, body measurements were made on lambs from all experimental groups before slaughter and at the end of the experimental period, which could indicate the general appearance of the body after fattening. The width at the coxo-femoral joints, the perimeter and length of the shank, the compactness and muscularity index of the shank were determined. The data obtained are presented in Table 2.

Table 2. Body measurements on lambs before slaughter

Specification		Meat Breed x Palas Merino hybrid lambs ICDCOC	Palas Merino lamb – ICDCOC	Suffolk x Merino hybrid lambs - Vadu	Merino lamb - Vadu
Width at hip joints (cm))	X ± sx	24.16 ±0.6009	20.33±0.3330	21.17±0.1667	17.83±0.1667
	V (%)	4.1	2.84	1.36	1.62
Perimeter of jig (cm)	X ± sx	61,67±0,8819	52.00±1.5275	53.0±1.5278	48.0±1.00
	V (%)	2,48	5.09	4.99	3.61
Jig length (cm)	X ± sx	22.33±0.3330	25.30±0.3330	24.00±1.1547	26.33±0.6667
	V (%)	2.59	2.28	8.33	4.8
Gigot compactness index (CIG) (cm)	X ± sx	108.24±2.7609	80.31± 2.0496	88.60± 4.2700	68.00±1.000
	V (%)	4.2	4,42	8,34	7,16
Gigot's muscularity index (GMI)	X ± sx	276.22± 5.1514	205.43±8.0284	221.38±6.8600	182.00±7.5400
	V (%)	3.23	6.77	5.37	7.16

From the obtained data, it emerged that the hybrid lambs from both crossbreeding variants had greater width dimensions at the coxo-femoral joints compared to the Merino lambs. Thus, the hybrids with the Palas Meat Breed had the width at the coxo-femoral joints of 24.16±0.6009 cm, 18.83% higher compared to the Merino lambs and the hybrids with the Suffolk breed had the width at the coxo-femoral joints of 21.17±0.1667 cm, higher by 18.73% compared to Merino lambs. The differences between hybrids and Palas Merino were highly statistically significant ($p<0.001$).

The values recorded for the jig perimeter were also higher in the hybrid lambs compared to the Merino breed, this being 61.67±0.8819 cm in the hybrids with the Meat Breed and 53.00±1.5278 cm in the hybrids with the Suffolk breed, the differences from a statistical point of view of the maternal breed being highly significant ($p<0.001$) for the hybrids with the Meat Breed and distinctly significant ($p<0.01$) for the hybrids with the Suffolk breed.

The results regarding the jig length reveal that the hybrid lambs had, as expected, smaller jig lengths, respectively 22.33 ± 0.3330 cm and 24.00 ± 1.1547 cm compared to 25.30 ± 0.3330 cm and 26.33 ± 0.6667 cm for the Merino lambs. This situation is specific to meat breeds that have smaller bone length dimensions, with larger width dimensions.

The values obtained for the two indices calculated, namely the index of compactness of the jig and the index of muscularity of the jig, which provide an image of the development of the rear train, had values higher by 34.78% for the index of compactness and 34.46% for the index of muscularity of the gigot in hybrids with the Meat Breed and by 30.29% for the compactness index of the gigot respectively 21.64% for the muscularity index of the gigot in hybrids with the Suffolk breed, compared to the Merino breed.

These values were similar to those in other experiments in which Suffolk x Merino hybrid lambs recorded a total growth rate in 60 days of fattening of 18.46 kg, being 17.43% higher compared to their contemporaries from the Palas Merino breed. (Vicovan et al, 2009).

Slaughter yield and calculated carcass indices are shown in Table 3. At ICDCOC Palas, from

the experimental lots, three lambs with average body development were selected for slaughter, while from the Vadu farm, the owner selected three lambs with lower body development.

The yield at slaughter in hybrid lambs from both crossbreeds had higher values, compared to Merino lambs, these being 47.68±1.0600 % for the hybrids with the Meat Breed (Figure 3) and 45.02±0.9100 % for those with the Suffolk breed (Figure 4), compared to 43.64±0.6300 % and 43.48±0.9500 % as obtained in Merino lambs.

The difference between the F_1 hybrid lambs (Palas Meat Breed x Palas Merino) and the Merino breed was 4.04 percentage points, and between the F_1 hybrids (Suffolk x Merino) and the Merino breed 1.54 percentage points, the differences being statistically insignificant.

Figure 3. Carcass F_1 Meat Breed x Palas Merino (original)

Figure 4. Carcass F_1 Suffolk x Merino (original)

Table 3. Slaughter yield, carcass quality indices and weight of component parts

Specification		Merino Palas - ICDCOC	F_1 Meat Breed x Palas Merino - ICDCOC	Merino - Vadu	F_1 Suffolk x Merino - Vadu
Live weight (kg)	X ± sx	39.57±0.5645	40.93± 1.6694	33.90±2.3553	37.15±1.1719
	V (%)	6.31	7.06	12.02	5.46
Cold carcass weight (kg)	X ± sx	17.27±0.2789	19.53±0.2652	14.74±1.3473	16.73±0.6848
	V (%)	6.71	5.99	15.78	7.09
Slaughter yield (%)	X ± sx	43.64±0.6300	47.68 ±1.0600	43.48 ±0.9500	45.02 ±0.9100
	V (%)	2.50	3.86	3.80	3.40
Slaughter yield at empty live weight (%)	X ± sx	49.50 ±0.6000	54.81 ±1.0900	47.91 ±1.5200	52.30 ±1.1800
	V (%)	2.08	3.45	5.48	3.92
Carcass compactness index (CCI)	X ± sx	30.01±0.9600	36.33±0.5000	28.72±0.5200	35.68±3.6600
	V (%)	5.52	2.41	3.13	17.77
Gigot compactness index (CIG)	X ± sx	74.97±1.5100	108.67±0.850	66.54±2.030	83.83±5.4600
	V (%)	3.04	0.66	6.19	33.56
Thigh muscularity index (MIT)	X ± sx	0.482±0.0131	0.569±0.090	0.448±0.0121	0.547±0.0317
	V (%)	4.69	2.71	4.69	10.04

The slaughter yield was also determined at the empty live weight, this representing the weight without gastrointestinal contents. Its values in hybrid lambs were also higher compared to Merino lambs, 54.81±1.0900% and 52.30 ±1.1800% compared to 49.50 and 47.91% in Merino lambs. The data thus obtained revealed higher, but statistically insignificant values in F_1 hybrid lambs (Palas x Merino Meat Breed) and significant ($p<0.05$) in F_1 hybrids (Suffolk x Merino), compared to Merino breed.

The data obtained showed that genotypes were not significantly influenced in terms of slaughter yield and the weight of certain regions in the carcass, the results being consistent with those reported by other authors. Thus, Merino and Texel hybrids increased the proportion of lean meat and decreased the proportion of fat, the difference being 5.7% (Osekowski and Borys, 1976). Similar results were also obtained by crossbreeding Dorper ewes with Ile de France rams and with Merino Landsheep, the crossbreed lambs recording a 10% increase in weaning weight compared to purebred lambs Cloete J.J.E. et al, 2007). Guttierrez J. et al. show in a 2005 study that crossbreeding Polish Merino ewes with Blackheaded, Ile de France and Texel rams did not fundamentally change the composition of carcass tissues in crossbreed lambs, but the use of Texel rams resulted in crossbreeds with carcasses with a fat content lower by 5.7%.

The determination of the carcass compactness indices shows that the two hybrid variants obtained higher values, namely 36.33 (Meat x Merino) and 35.68 (Suffolk x Merino) compared

to the values recorded for Merino lambs of 30.01 and 28.72 respectively.

The compactness index is a strong indicator of carcass conformation, considered that it can be used to evaluate the amount of muscle tissue stored in the carcass per unit length. This characteristic is interesting from an economic point of view given that markets prefer large, compact carcasses with a higher proportion of muscle tissue.

Two other indices that give relationships about the amount of muscle in the carcass are the compactness index of the gigot and the muscularity index of the thigh. The results obtained show that the lambs from the two hybrid variants had significantly higher values for the two indices compared to the Merino breed. The compactness index of the gigot ICJ in hybrid lambs with the Palas Meat Breed was 108.67, higher by 44.95% compared to the Merino lambs (highly statistically significant differences $p<0.001$) and in hybrid lambs with the Suffolk breed it was 83.83, higher by 25.98% compared to the Merino lambs (distinctly significant differences $p<.0.01$). The thigh muscularity index also had higher and similar values in the two hybrid variants, 0.569 ±0.090 in hybrids with the Palas Meat Breed and 0.547±0.0317 in hybrids with the Suffolk breed, the differences being distinctly significant compared to Merino lambs ($p<0.01$).

After cutting, the weight, weight of the shank, the forelimb, the rest of the carcass and the tissue structure of the carcass were determined (Table 4).

Table 4. Weight, proportion of component parts and tissue structure of carcasses in lambs from experimental groups

Specification			Merino Palas - ICDCOC	F_1 Meat Breed x Palas Merino - ICDCOC	Merino - Vadu	F_1 Suffolk x Merino - Vadu
Gigot	Weight (g)	X ± sx	2760.0±80.467	3180.0±164.798	2408.33±254.3019	2658.33±152.3793
		V (%)	5.5	8.98	18.29	9.93
	Percentage	(%)	32.07	33.19	33.00	32.98
Forelimb	X ± sx V (%)	X ± sx	1536.67±62.871	1876.67±104.2566	1406.67±132.8324	1590.00±70.8872
		V %)	7.09	9.62	16.36	7.72
	(%)	(%)	17.86	19.58	19.30	19.75
Rest of the carcass	X ± sx V (%)	X ± sx	4305.0±85.044	4528.33±261.507	3461.67±296.5683	3800±120.9683
		V (%)	3.42	10.0	14.84	5.51
	(%)	(%)	50.06	47.23	47.58	47.25
Muscle (%)		X ± sx	59.58±1.6900	62.40±1.0100	60.41±0.3100	60.55±2.1300
		V (%)	4.90	2.82	1.89	6.11
Bones (%)		(%)	23.92±0.2300	23.62±1.2700	26.18±0.7700	24.76±0.7800
		X ± sx	1.66	9.31	5.10	5.44
Fat (%)		V (%)	16.45±1.4900	13.05±2.2600	13.26± 0.900	14.56±2.8800
		(%)	15.70	28.08	2.89	34.26

The analysis of the obtained data shows that between hybrid lambs and Merino, no significant differences were found in the weight of the gigot, weight of the forelimb and the weight at rest of the carcass.

The weight of the gigot was 32.07% in Merino lambs and 33.19% in hybrids with the Palas Meat Breed and 33.00% and 32.98% respectively in Merino lambs and hybrids with the Suffolk breed. No significant differences were found in the weight of the forelimb between the two hybrid variants and the Merino breed, which represented almost 20% of the weight of the half-carcass analysed.

Analysis of the tissue structure of the half-carcass in experimentally slaughtered lambs, according to the data presented in Table 4, showing that the F_1 hybrid lambs (Meat Breed x Palas Merino) had the highest amount of meat in the half-carcass, the muscle weight being 62.40%, 2.82 percentage points higher than the Palas Merino breed. In this variant, the bones did not show differences compared to the maternal breed, finding that in hybrid lambs the carcasses had a lower fat percentage of 13.05% compared to 16.45% as recorded in the carcasses of Palas Merino lambs.

This aspect together with that relating to the higher weight of the carcasses is in accordance with the current market requirements for meat lambs, supporting the support of crossbreeding

programs to obtain meat lambs in demand on the market.

F_1 hybrid lambs (Suffolk x Merino) did not show differences in carcass muscle percentage compared to the Merino breed but had a 5.7% lower bone percentage compared to the parent breed.

CONCLUSIONS

Summarizing the results obtained, it can be concluded that both variants of hybrids between the Merino breed and the two meat breeds achieved better growth gains and lower feed and nutrient consumption compared to the maternal breed.

The assessment of the results following the slaughter of the lambs revealed higher values of the hybrid lambs for the slaughter yield and carcass quality indices, which illustrates the beneficial effect of the meat breeds used on improving the conformation of the hybrid lambs.

Currently, the Merino breed has a small share in the Romanian sheep herd and the scientific information thus obtained serves in practice to choose a way to better exploit the lambs of this breed by applying crosses with a meat breed.

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