

## RESEARCH ON QUANTITATIVE PARAMETERS IN THE MEAT PRODUCTION AT LAMBS OBTAINED FROM CROSSBREEDING ILE DE FRANCE BREED X PALAS MERINO BREED

Andrei PUIE, Ion RĂDUCUȚĂ, Nicoleta TEODORESCU (ROȘU), Laurenția DUMAN, Corneli FRUJINĂ, Vasile DREVE, Ion CĂLIN

University of Agronomic Sciences and Veterinary Medicine of Bucharest, 59 Marasti Blvd, District 1, Bucharest, Romania

Corresponding author email: raducion@yahoo.com

### Abstract

*The aim of this work is to bring new information on the possibilities of increasing production and improving the quality of meat, obtained from local Palas Merino breed by crossbreeding with Ile de France breed. The subject is topical, bearing in mind that the main production at European level for exploiting sheep is meat production and the demand for sheep meat has increased considerably, both in traditional consuming countries and outside in developed ones, but especially in countries with a developing economy, and the sheep meat price in certain countries is with 20-30% higher than the price of poultry or pork meat. The experiments were carried out in two successive years on three lots of lambs, respectively a control batch one and two experimental lots, during the suckling period of lambs until weaning them, respectively for a period of 60 days. During this period lambs have had permanent access to maternal milk but also at good quality hay and concentrated feeding stuffs the last one being administered to discretion in special places. Results regarding average daily gain and total growth weight of lambs during suckling period were performed by individual weighing of lambs at birth, at 30 days and 60 days, depending on the type of birth and sex of lambs. The results of the experiment highlighted the fact that the crossbred lambs from the third group have recorded the best quantitative performances in the meat production.*

**Key words:** crossbreeding, lambs, meat production, quantitative parameters.

### INTRODUCTION

The importance of sheep rearing is fed to both biological and economic value of the carried out productions, but also to the maximum value of sheep, transforming in meat, milk, wool, pelts and skins, grass on the pasture and agricultural by-products (Călin, 2003).

The aim of this work is to bring new information on the possibilities of increasing production and improving the quality of meat at lambs obtained from local Merino breed of Palas crossed with Ile de France breed.

The subject is topical, bearing in mind that the main production at European level for exploiting sheep is meat production and the demand for sheep meat has increased considerably, both in traditional consuming countries and outside in developed ones, but especially in countries with a developing economy, and the sheep meat price in certain countries is with 20-30% higher than the price of poultry or pork meat.

The fastest way to increase meat production of local breeds is by crossing them with specialized breeds of meat (Taftă et al., 1997; Răducuță, 2010; Călin et al., 2010).

### MATERIALS AND METHODS

The experiments were carried out in two successive years on three lots of lambs. The period of suckling lambs has lasted for 60 days during which lambs have had permanent access to sheep's milk moms but also good quality hays and concentrated feeding stuffs administered to discretion in special places.

Results on body weight gain and growth during lactation has determined the body weight at birth, at the age of 30 days, and at the age of 60 days, depending on the type of birth and sex of lambs, as well as the average daily increase in 0-30 days, 31-60 days and 0-60 days. Experimental determinations were performed by weighing individual lambs.

For carrying out the proposed studies two experimental batches and a control batch have been created, as follows (Table 1):

- Batch no. 1 – Merino breed of Palas females that were crossed with Merino breed of Palas males (control batch);

- Batch no. 2 - Merino breed of Palas females that were crossed Ile de France breed males (experimental batch no. 1);

- Batch no. 3 - F<sub>1</sub> half breed sheep (obtained by the crossing between Merino breed of Palas females with Ile de France breed males), that were crossed with Ile de France breed males care (experimental batch no. 2).

Table 1. Studied biological material

Crt. no.	Experimental year	Biological material
1	Year I	Batch 1 ♂MP x ♀ MP
2	Year II	
3	Year I	Batch 2 ♂IF x ♀ MP
4	Year II	
5	Year I	Batch 3 ♂IF x ♀ (MP x IF)
6	Year II	

During the experiment period lambs supplementary feeding was performed, since a very early stage, starting with the age of 8-10 days, in specially designed pens where only lambs had access. Additional food consisted of high quality alfalfa hay and farm mixed fodder ad libitum. Farm mixed fodder consisted of 45% maize, 50% barley and the difference was the sunflower meal 5% (Table 2).

Table 2. The chemical composition of mixed fodder

Farm mixed fodder composition	Unit of measure	Quantity
Energy	(MNC/kg)	1.09
Digestible crude protein	(g/kg)	156.64
Crude protein	(%)	15.72
Raw fat	(%)	2.52
Raw cellulose	(%)	6.84

Ash	(%)	6.22
Calcium	(%)	1.07
Total Phosphorus	(%)	0.43
Total chlorides	(%)	0.025
Vitamin A	(UI/kg)	9626.45
Vitamin D3	(UI/kg)	2188.70
Vitamin E	(mg/kg)	19.46

\*MNC = meat nutrition units.

All lambs obtained from the two experimental batches, as well as the ones from the control batch were used in determining body weight during the experimental period, respectively during the 60 days of suckling period (birth – weaning).

## RESULTS AND DISCUSSIONS

The highest birth weights in both year I and year II were obtained by males from Batch no. 3 (♂IF x ♀ (Mp x IF)) coming from single parturitions achieving a weight of  $4.869 \pm 0.136$  kg in year II, 3% more weight than the weight achieved with lambs from Batch no. 2 (♂IF x ♀ MP) in year II. The lower weights have been achieved, both in the year I, as well as in year II by the lambs from Batch no. 1 (♂MP x ♀ MP), with 9% lesser, indicating the positive performance of the Ile de France breed towards meat production and, especially, transmitting power of superior characteristics as regards meat production to descendants (Table 3).

As regards the weight at parturition, females recorded similar results. Thus, the best performances are made by females achieved by the Batch no.3 (♂IF x ♀ (Mp x IF)) with single parturition:  $4.467 \pm 0.089$  kg in year II, almost 17% more than females belonging Merino breed of Palas. Between Half breed batches are not registering significant differences, respectively Batch no. 3 registered a weight with 8% superior to that achieved by females belonging to Batch no. 2 (♂IF x ♀ MP).

Table 3. Lambs weight from experimental batches at birth

Lots	Year	Single parturition						Twin parturition					
		Male			Female			Male			Female		
		n	$\bar{X} \pm S_{\bar{X}}$	V (%)	n	$\bar{X} \pm S_{\bar{X}}$	V (%)	n	$\bar{X} \pm S_{\bar{X}}$	V (%)	n	$\bar{X} \pm S_{\bar{X}}$	V (%)
1	I	15	4.372±0.093	8.24	15	3.728±0.093	9.82	15	3.625±0.110	11.79	15	3.268±0.106	12.60
	II	15	4.442±0.097	8.52	15	3.824±0.077	7.88	15	3.713±0.105	10.98	15	3.470±0.090	10.04
2	I	14	4.512±0.134	11.10	14	3.951±0.119	11.29	14	3.831±0.132	12.92	14	3.483±0.125	13.46
	II	14	4.732±0.161	12.78	14	4.121±0.112	10.22	14	3.946±0.141	13.37	14	3.652±0.090	9.23
3	I	13	4.611±0.125	9.83	13	4.313±0.092	7.75	13	4.242±0.119	10.11	13	3.709±0.132	12.87
	II	13	4.869±0.136	10.13	13	4.467±0.089	7.22	13	4.392±0.162	13.31	13	3.929±0.120	11.04

At the age of 30 days the same trend between batches persists still the half breed batches groups are achieving the best results (Table 4).

Thus as regards males it can be observed that compared to the Batch no.1 (♂MP x ♀MP) the difference in weight is increasing. Batch no. 3 (♂IF x ♀(Mp x IF)) achieving an average weight of approx. 13.0 kg in year II with more than 2.0 kg higher (over 19%). Also Batch no. 2 reaches a weight of 12.028 ± 0.415 kg by more than 1.13 kg superior (approx. 10%).

Concerning males obtained out of twin parturition they gain less weight at this age than those from single parturitions with approx. 6-7% (differences between similar groups), but it should be noted that the experimental batches recorded weights higher than those achieved by the control batch males obtained from single parturitions.

Females follow the same growth curve at the age of 30 days. The best results being obtained

by animals from experimental batches with simple parturition, particularly Batch no. 3 in year II when females at the age of 30 days reached a weight of 12.088 ± 0.297 kg, superior to the weight achieved by the other batches (approx. 6% more compared to Batch no 2 and 13% compared to the control batch).

In the case of twin parturitions the weight of females achieved at this age are inferior with approx. 5% than the weight of females obtained from single parturitions that are similar to those identified by other authors (Teodorescu et al., 2013).

The increase in weight of the experimental batches gained both by females and especially males are due to higher feed conversion capacity and outstanding breed precocity registered by the paternal breed and the expression of these traits to their descendants.

Table 4. Lambs weight from experimental batches at the age of 30 days

Lots	Year	Single parturition						Twin parturition					
		Male			Female			Male			Female		
		n	$\bar{X} \pm S_{\bar{X}}$	V (%)	n	$\bar{X} \pm S_{\bar{X}}$	V (%)	n	$\bar{X} \pm S_{\bar{X}}$	V (%)	n	$\bar{X} \pm S_{\bar{X}}$	V (%)
1	I	15	10.608±0.306	11.17	15	10.181±0.280	10.67	15	10.018±0.336	13.01	15	9.634±0.279	11.20
	II	15	10.901±0.262	9.30	15	10.672±0.273	9.91	15	10.286±0.336	9.07	15	10.023±0.329	12.71
2	I	14	11.785±0.345	10.96	14	11.035±0.358	12.14	14	11.006±0.300	10.22	14	10.420±0.333	11.98
	II	14	12.028±0.415	12.92	14	11.360±0.265	8.72	14	11.339±0.351	11.59	14	10.707±0.274	9.57
3	I	13	12.534±0.396	11.38	13	11.814±0.03	10.00	13	11.534±0.446	13.96	13	11.098±0.321	10.44
	II	13	12.979±0.365	10.14	13	12.088±0.29	8.86	13	12.026±0.364	10.91	13	11.373±0.300	9.51

The best results as regards body weight at the age of 60 days were achieved by males from Batch no. 3 obtained from single parturition, which recording the highest weight at weaning both in year I and year II (20.107 ± 0.497 kg or

20.657 ± 0.434 kg), consecutive to a variation coefficient of 7.51% which indicating a very good homogeneity of the analyzed batch (Table 5).

Between experimental and control batches significant differences were registered, differences that were highlighted last weighing. Thus, between Batch no. 3 and the control batch (Batch no. 1) in year II, differences of 3.1 kg have been achieved (with more than 50% higher than the differences at age to 30 days) and between Batch no. 2 and the control batch differences with more than 7% were recorded at the end of the experimental period.

The accumulation of body weight at the end of the experimental period for lambs obtained from single parturition in study year II were as follows: 13.12 ± 0.383 kg control batch; 14.18 ± 0.440 kg Batch no. 2 and 15.79 ± 0.383 kg Batch no. 3.

Outstanding results were also recorded in the case of males from experimental groups obtained from twin parturitions, which achieved weights with approx. 6% lower than males obtained from single parturitions.

The results obtained in this experiment are similar to those found by other authors (Teodorescu et al., 2012; Teodorescu et al., 2013), but higher than those achieved by the

control batch, particularly in the case of Batch no. 3 which gained at the end of the experimental period a higher weight (with over 11%). At the end of the experimental period the batches achieved the following body weight accumulations: 12.63 ± 0.312 kg control batch; 13.82 ± 0.314 kg Batch no. 2 and respectively 15.15 ± 0.424 kg Batch no. 3.

Females belonging to Batch no. 3 from single parturition have achieved the best growing performance which achieving an average weight of 18.892 ± 0.334 kg in study year II a total weight increase of approx. 14.424 ± 0.341 kg (approx. 12.6% more than the accumulation of body weight carried by the control batch and with 2.2% more than the increase gain achieved by Batch no. 2.

Females obtained from twin parturitions achieved modest results with a total increasing gain of 12.44 ± 0.286 kg in the case of the control group 13.75 ± 0.377 kg for Batch no. 2 and 14.26 ± 0.356 kg for Batch no. 3. Between the performances achieved by Batch no. 3 and Batch no. 1 significant differences were recorded.

Table 5. Lambs weight from experimental batches at the age of 60 days

Lots	Year	Single parturition						Twin parturition					
		Male			Female			Male			Female		
		n	$\bar{X} \pm S_{\bar{X}}$	V (%)	n	$\bar{X} \pm S_{\bar{X}}$	V (%)	n	$\bar{X} \pm S_{\bar{X}}$	V (%)	n	$\bar{X} \pm S_{\bar{X}}$	V (%)
1	I	15	17.351±0.344	7.69	15	16.366±0.266	6.30	15	16.018±0.296	7.16	15	15.426±0.253	6.36
	II	15	17.566±0.272	5.99	15	16.633±0.345	8.03	15	16.343±0.324	7.67	15	15.913±0.252	6.14
2	I	14	18.498±0.363	7.35	14	17.787±0.302	6.35	14	17.484±0.399	8.54	14	17.045±0.326	7.17
	II	14	18.910±0.411	8.14	14	18.228±0.396	8.12	14	17.764±0.366	7.70	14	17.403±0.259	5.57
3	I	13	20.107±0.497	8.92	13	18.503±0.370	7.21	13	18.807±0.618	11.8	13	17.615±0.458	9.38
	II	13	20.657±0.434	7.51	13	18.892±0.334	6.37	13	19.538±0.416	7.67	13	18.196±0.372	7.37

## CONCLUSIONS

Crossing Merino breed of Palas females with Ile de France males has a direct effect on the main meat production related indicators.

Half breed lambs from Batch no.3 registered the highest weight at birth regardless of the type of birth and sex. Lambs belonging to the control batch achieved the lowest weights at birth both in year I and year II and Batch no. 2 lambs recorded intermediate weights at birth.

Half breed lambs from Batch no. 3 both males and females have achieved in both study years the highest average weights both at the age of

30 days as well as at the age of 60 days, while the lowest values were achieved by the Merino breed of Palas lambs. Lambs belonging to Batch no. 2 were on the second place according to the body weight achieved both at the age of 30 days and at the age of 60 days.

Body weight differences recorded between the experimental batches at the age of 60 days, both in the first study year and in the second study year, were very significant between lambs from Batch no. 3 and the maternal breed. Body weight differences recorded were significant among half breed females from Batch no. 2 and Merino breed of Palas females.

The maternal Merino breed of Palas has a particular combinatorial capacity with breeds specialized for meat production and especially with the Ile de France breed. The resulting F1 half breeds are showing high abilities towards birth weight growth gain, feed conversion capacity and weight achieved at weaning.

## REFERENCES

- Călin I., 2003. Tehnologia creșterii ovinelor și caprinelor. Editura Universității „Lucian Blaga” Sibiu, 10-25.
- Călin I., Pădeanu I., Pascal C., Dărăban S., 2010. Results concerning the fattening of halbreeds stemming from the crossing of Turcana breed with Ile de France breed. Scientific Papers, Series D, Animal Science, Vol. LIII, 454-461.
- Răducuță I., 2010. Sporierea producției de carne la ovine prin încrucișare industrială. Revista de Zootehnie, nr. 1, 25-28.
- Teodorescu (Roșu) N., Călin I., Tăpăloagă P.R., Roșu , I., 2012. The influence of supplementary feeding of lambs concerning their body weight at the end of the lactation. Scientific Papers, Series D, Animal Science, Vol. LV, 96-98.
- Teodorescu (Roșu) N., Călin I., Tăpăloagă D., Tăpăloagă R.P. 2013. Study regarding the productive performances of the halfs blood between Merino Palas breed sheep and Ile de France breed sheep. Lucrări Științifice, Seria Zootehnie, 59, 117-120.
- Taftă V., Vintilă I., Zamfirescu S., 1997. Producția, ameliorarea și reproducția ovinelor. Editura Ceres, 150-175.