

THE EFFECT OF CROSSING ROMANIAN SHEEP BREEDS WITH RAMS OF MEAT BREEDS OVER THE SPECIFIC INDICATORS OF MEAT PRODUCTION

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Abstract

The purpose of the research was to investigate new solutions for the production of increased sheep meat quantities. The opportunity to carry out these surveys is because Romania has a very good position among the countries with large herds of sheep and that at European Union level requirements for sheep meat are not assured. In order to achieve the objectives set out above we included in the scheme for the production of the biological material for recovery for the main breeds in Romania, namely the Merinos de Palas and Tigaie, at which we add the Bluefaced Leicester and Suffolk. Biological material intended for fattening was a hybrid produced from crossing triracial females mixed-race F1 (Bluefaced Leiceste x races) with Suffolk rams. Weaning lambs was made at the age of 85 days, and to remove the influence of the age was taken into account that differences in this parameter to be less than 25 days. The technology was applied to fattening of intensive type, and had a total duration of 90 days. Intensity analysis of fattening each batch was weighed at the beginning of each phase, weaning, fattening and started at the end of fattening, and to compare the results, control groups were made. In the case of consignments composed by using the breed of Merinos de Palas, the weight of the control group was lower by 5.2% as compared to the performance by the group composed of hybrid terminals, from which the final live weight was 40 kg. For the following experimental formats by using the Tigaie, the control batch though has the onset of fattening a bodyweight with 8.64 percent compared with the batch composed of triracial hybrids, final live weight was more than 20% higher in the experimental batch. The results obtained at the fattening, and the quality of the carcasses being much better at experimental batches justifies the practicing of this type of crossing.

Key words: sheep, meat, Tigaie, Romanian breeds, industrial cross

INTRODUCTION

Taking into consideration the agricultural surface, Romania is one of the first countries (situated on the 5th place in Europe, with a share of 8% from the total UE-27). Through the labor force engaged in agriculture and food industry, Romania has all the chances to become a net exporter of food produces, especially the animal once obtained from sheep. Although in Romania the objectives for growing sheep are multiple (milk, meat, wool, skins), lately major efforts are being made to increase meat production. The purpose of these concerns is to make Romania an

important provider of sheep meat and to satisfy the request made by the countries situated in the Near East (Lebanon, Iran, Syria, Jordan) for meat originated from the exploitation of young and adult sheep, or those of the countries from the European Union for the meat obtained from the slaughtering of fattened young sheep. To provide breeders more information from this domain, during the researches there were organized studies and experiments starting from hybrid lambs obtained by crossing Romanian sheep with rams from meat breeds, which have the quality to improve this product.

MATERIAL AND METHODS

Biological material used in research was represented by several batches of hybrids

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produced from crosses with mixed-race mother sheep with rams belonging to breeds with very good skills for the production of meat. In order to assess the skills for the production of meat, the performance made by half breeds were compared with those recorded in the youth batches of maternal breeds, subject to the same conditions of fattening by feeding and maintenance.

Witness batches belonged to local breeds Merinos of Palas (M1) and (M2) Tigaie and the experimental batches were made from trirasial hybrid lambs resulting from the crossing of Suffolk with F1 hybrid females Bluefaced Leicester x Merinos of Palas (L1) and Suffolk with F1 hybrid females Bluefaced Leicester x Tigaie (L2). The weaning of the individuals was carried out at the age of 85 days.

Applied fattening technology was intensive, with a total duration of 90 days and had three phases (accommodation, growth and fattening and finishing). The duration of fattening was administered a ration with optimal structure so that youth can externalize fattening performance in production. To determine the specific daily consumption the feeds were weighed before administration, the remnants remaining unused. At the beginning and end of each phase there were made weighing of the lambs, and based on the results it was determined the total rise, average daily increase and consumption. In statements made to avoid calculation errors induced by the gastrointestinal contents, the concerned individuals were no longer feed with 12 hours before slaughter. Objective assessment of carcasses was done by determining the following items: table, return to the slaughter, the determination of the physical structure of the carcasses, case classification on quality methods applied in the European Union and cut portions of the case depending on the quality. After the assessments carried out on the carcasses, they were cut into regions for slaughter, and then they were boned to determine the bones/meat ratio, both for housing and for each region cut.

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.

RESULTS AND DISCUSSIONS

At the end of the period, to assess the performance of fattening, batches have been established. Lambs included in each batch, belonged to the same genotype and in order to avoid the influence of age, the weaning of the lambs was made at 85 days from birth.

The evolution of weight and body mass build-up was assessed by weighing all the individuals at the start and at the end of 90 days of intensive fattening. Analysis of the data shows that the intensity of growth and fattening capacity was different in the four batches set up, which will be presented and analyzed separately, depending on the use of cross breeds of Romania.

In the case of batches obtained using local breed Merinos of Palas, the onset of fattening lambs obtained by using it, the difference in body weight between the batches was favorable to the purebred. These had a higher absolute weight with 2,749 kg, distinct difference significant $P \leq 0.01$. The existence of such situations may be justified only on the basis that the mother sheep of the bred Merinos of Palas had a superior lactose secretion, which allowed the lambs to take full advantage of the specific growth rate from the first postpartum periods. In the specific literature there are reported similar situations which support this claim [2, 3, 5, 68, 9, 12, 15, 16, 17]

At the end of the fattening period, the situation observed was different from those found at the onset. The average weight of the consignment of the witness, constituted by Merinos of Palas lambs was lower with 5.2% compared with the performance of the batch composed of trirasial hybrid that had at the end of the period a live weight of over 40 kg. In the specific literature there are reported and other similar situations. So, *Inger (1986)* [11] on the basis of the research undertaken shows that half breed Suffolk x Swedish Landrace the body weights were recorded live, at 34.200 kg at the age of 120 days. Also, in another experience [18] shows that the products produced from crosses of the same breed with rams of the local Suffolk breed, the half breed genotype has achieved a higher average body weight with 19,95%

compared with the live weight of the purebred Merinos of Palas lambs.

In these circumstances, on the basis of the values recorded at the end of fattening based on the lambs weighing, highlights a reverse situation. Thus, if the average body weight of the onset of the triracial half breed lambs was reduced with 14.33% they had at the end of fattening a larger body weight with 5.22%

compared with the average final weight determined at the purebred lambs. The recovery of the differences from the moment when the batches were made was possible because of the precocity of the half breed, expressed by the higher intensity of growth, and at the time when the process of fattening this batch had a higher weight.

Table 1 Evaluation of accumulations of body mass during fattening and the significance of the differences between the batches using the breed Merinos of Palas (n = 12)

Specification	Merinos of Palas		Suffolk x (BFL x M2)		Statistical significance of differences
	$\bar{X} \pm s \bar{x}$	V%	$\bar{X} \pm s \bar{x}$	V%	
Weight at the beginning of fattening (kg)	19.182 ± 0.843	14.58	16.433 ± 0.289	6.10	(10.19954) F α > 0.01 (8.016627) *
Weight at the end of fattening (kg)	38.227 ± 1.020	8.86	40.333 ± 1.045	8.98	(2.065197) < F α 0,05 (4.324789) ns
Increase total (kg)	19.045 ± 0.763	13.30	23.900 ± 1.006	14.58	(14.36032) F α > 0.01 (8.016627) *
The average daily growth (g)	210.7 ± 8.526	13.30	265,6 ± 11.180	14.58	(14.88003) F α > 0.001 (14.58648) ***

Note: ns-not significant; *-significant; **- distinct significantly; ***- very significant

In these circumstances, both the increase and the average daily total increase achieved during the fattening period had higher values at the triracial half breeds. In the case of this batch, due to the fact that the total increase during fattening was higher by about 20.31% and the average daily increase with 20.67% we can conclude that the skills for the production of meat are better expressed at triracial half breeds.

By analyzing the data obtained at the end of fattening, you may find that the industrial crossbreeding with rams from meat breeds, one of their characteristics, also noted by other authors [1, 4, 7, 10, 5, 13, 18, 19], namely those of weights at early age (precocity), is very well laid out to the half breed batch. In terms of the variability coefficient, the average values are less than 15% can be said to have been somewhat homogeneous batches (table 1).

In the case of the Tigaie breed the formed batches were made up of youth of purebred sheep and lambs which were obtained by

crossing of hybrid F1 (BL x Ti) and which later were used for breeding with Suffolk breed rams, in order to obtain triracial hybrids specialized for meat production.

Reported to the data presented in table 2, we note that in this case the consignment consisting of lambs belonging to local Tigaie breed had at weaning and at the fattening debut a superior bodyweight with 8.64% compared with the batch composed of triracial hybrids.

Just as in the case of the Merinos of Palas breed, this situation can be justified through two distinct and different points of view:

- a better lactose capacity of the maternal breed, which is justified by the fact that at the Tigaie breed, one of the main conditions in selection is milk production;
- the manifestation of different features of growth and body development in youth categories.

This last statement is supported by the fact that research has found that at the batch of individuals belonging to the local breed

the speed of growth was more intense during lactation, and at the batches formed from hybrids, the corporal development records a more increase rate after weaning, this meaning the fattening period.

In these circumstances, as a result of the growth of total accumulated throughout the fattening, we find that at the end of the

fattening the triracial hybrid batch had higher average values with 37,87% compared to the data recorded in the control batch. Statistical processing of the data show that the difference between batches, recorded at the end of the period, had a different degree of significance for the 1% thresholds, and that 5% one.

Table 2 Evaluation of accumulations of body mass during fattening and the significance of the differences between the batches using the race

Consignments	N	Weight at the fattening debut (kg)	Weight at the end of fattening (kg)	Total increase (kg)	The average daily growth (g)	
		$\bar{X} \pm s \bar{x}$	$\bar{X} \pm s \bar{x}$	$\bar{X} \pm s \bar{x}$	$\bar{X} \pm s \bar{x}$	
Tigaie	12	18.785± 0.705	32.521 ± 0.511	13.736+ 0,254	152.621 ± 0.350	
Suffolk x (BL x Ti)	12	17.130+ 0.467	39.242 ± 0.258	22.112± 0,562	245.68 + 0.213	
Tukey Test					d	s.d.
Weight at the beginning of fattening Tigaie and Suffolk x (BL x Ti)					+ 1.65	*
Weight at the end of fattening Suffolk x (BL x Ti) and Tigaie					+ 4.721	**
W _{5%} = 1.75; W _{1%} = 3,67. Note: * significantly; ** significantly different						

The determined values for the average daily increase highlights the outstanding performance achieved by the batch composed of terminal hybrids. At this batch, the rate of accumulation of daily body weight was higher with 37.87% than that of the control batch consisting of youth Tigaie purebred. In both cases it is clear that in expressing the rhythm more intense growth, found at the triracial hybrids, had an important role and influence of the two breeds of meat used in the crossing. These breeds, that induce to the mixed-race batches better features prove that are very good ameliorative of all indicators of which depends on the production of meat from sheep.

Related to this aspect in an experience carried out in the year 1968 Kincaid, quoted by [13, 14], using alternating at two females bathes belonging to different breeds, with two rams as well belonging to different race, but one with a higher weight (Hampshire) and one with a lower weight (Southdown), established between products obtained by using at mating those two rams, an average of 0.476 kg statistically significant. This means that the ram has a direct effect over the weight at birth and consequently for the

crossing this effect must be taken into account.

Analyses of the degree of precocity for speed of growth for the youth. The existence of these differentiations between the experimental and control batches may be attributed to the different degree of precocity, a feature broadcast on the two breeds of meat namely Blue Faced and Suffolk. The pace of body development for the two periods of lactation and fattening is highlighted by the values from the figure 1.

The study of the values obtained for the batches at the formation of which the breed Merinos of Palas was used indicates the fact that while the control batch carries out during the period of lactation 19.85% from the final weight, the batch formed of triracial hybrid individuals only carried out 16.43%. However, the same analysis carried out on the basis of accumulation of body mass during all periods of fattening highlights the fact that while the total increase for the half breed batch is 59,24% from the final weight, at the control batch the muscle masses collections share the same interval was only 50.88%. Carrying out the same analyses and appraisals for the obtained values from the formed batches of Tigaie lambs and triracial

hybrids Suffolk x (BL x Ti) shows different situations. The batch formed by the Tigaie lambs had a more intense growth increase during the lactation period, accumulating on

this range about 57.75% and during the fattening period the accumulation was superior with 42.24%.

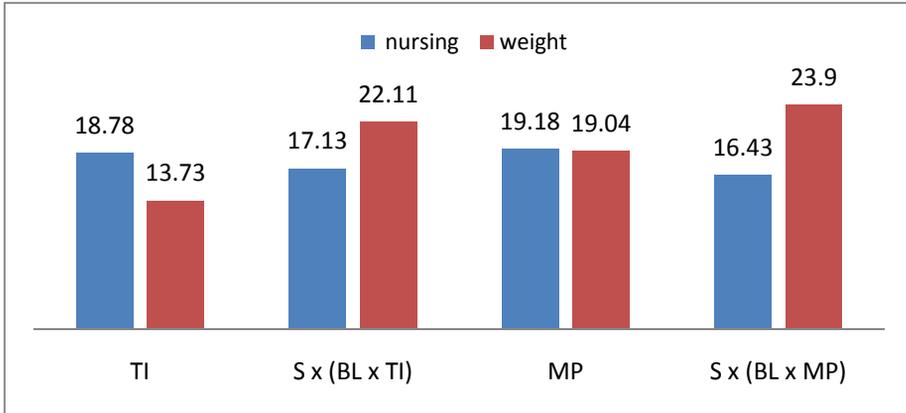


Fig. 1 Dynamic accumulations of body weight during lactation and fattening (kg)

The half breed S x (BL x Ti) had at the end an average weight of 39.242 ± 0.258 kg, from which 43.65% was acquired during the lactation period and 56.35% during the fattening. The presence of these differentiations, even in circumstances where an attempt was made to limit the influence of foreign factors indicates that the practice of this type of mating makes it easy to obtain a half breed youth sheep with very good qualities and a very good rate of growth at fattening.

The slaughter yield is an extremely important indicator in the appreciations that aim the meat production. It is influenced by a number of factors, of which nutrition is the most important technology of fattening. In order to limit their influence in research the alimentation was uniform as applied the fattening technology. With regard to this last aspect, several authors cite lower values of slaughter yield in the case of fattening the youth sheep based on the volume forage [8, 16].

At the end of the fattening period, control slaughters were made in order to determine the main quantitative and qualitative properties of the carcasses and meat from the carcasses, as well as the efficiency of the slaughter. In this sense, from each experimental batch, at the

end were slaughtered 6 individuals belonging equally to both sexes. In the research conducted on the batches of half breed and purebred lambs, the calculated efficiency was the slaughterhouse and the commercial. The obtained data for the analyzed batches are centralized in table 3.

On the basis of live weight recorded before slaughter and carcasses weighed hot and cold, there were determine average values specific to the calculated yield immediately after slaughter, or at warm and at 24 hours refrigerated (cold).

The warm efficiency with the highest values, was recorded in the case of slaughter of the lambs of the half breed batches S x (BL x Ti) and Suffolk x (BL x MP) and have been of 52.20% and 51.65%. The determination of the same indicator for the control batches indicates the existence of some net differences, and in conditions in which the highest value of 44,18% was from the Merinos of Palas and 43.62% from Tigaie it can be concluded that local breeds have much lower average yields than the half breed justifying the point of view of the research. The net differences found were distinctly significant for $p > 5$.

Table 3 Carcas weight and yield at slaughtering

Specification	Statistics	Genotype			
		Merinos of Palas	S x (BL x Ti)	Tigaie	S x (BL x Ti)
Carcasses weight at hot (kg)	$\bar{X} \pm s \bar{x}$	17.133 \pm 0.674	20.833 \pm 2.308	14.189 \pm 0.331	20.523 \pm 0.203
	V%	3.6	5.51	7.2	6.7
	Minimum	16.5	19.0	13.0	19.5
	Maximum	17.5	21.8	14.6	21.0
Carcasses weight at cold (kg)	$\bar{X} \pm s \bar{x}$	16.563 \pm 0.658	20.088 \pm 1.122	13.789 \pm 0.501	19.715 \pm 0.355
	V%	6.8	9.7	8.8	6.7
	Minimum	15.5	18.8	12.7	19.5
	Maximum	provides	20.5	13.9	21.0
Hot efficiency (%)	$\bar{X} \pm s \bar{x}$	44.819 \pm 0.386	51.652 \pm 1.792	43.632 \pm 1.417	52.200 \pm 0.429
	V%	3.6	6.51	7.2	6.1
	Minimum	43.7	52.2	41.9	49.8
	Maximum	46.5	58.1	43.7	53.5
Cold efficiency (%)	$\bar{X} \pm s \bar{x}$	43.328 \pm 0.890	49.805 \pm 1.350	42.400 \pm 0.231	50.239 \pm 0.231
	V%	3.9	4.7	6.5	6.3
	Minimum	43.8	47.5	41.9	49.8
	Maximum	44.75	50.0	42.7	50.7

So, using the crossings rams from meat breeds with ewes of indigenous breeds, they have contributed in particular to the increasing of the corporal weight recorded at the end of the fattening period and the weight increases of the carcasses and the slaughter efficiency for half breed lambs.

CONCLUSIONS

At the onset of the fattening the weight differences were favorable to both batches composed of lambs local breeds, and the explanation that can be given to this fact would be that the mother sheep of the Merinos of Palas and Tigaie breeds have had a lactation secretion, which allowed the lambs to take full advantage of the growing rate specific to the first postpartum periods.

In the case of the analysis of the influence of the Merinos of Palas breed is apparent that if the average body weight of the onset of the trisial half breed lambs was lower with 14.33%. At the end of the fattening they had a body mass superior with 5.22% compared with the average final weight determined at the purebred lambs, recovering differences recorded at the time when the batches were formed.

At the end of fattening the trisial hybrid batch S x (BL x Ti) had higher average values with 37,87% comparative with the recorded data from the control batch, recovering the difference from the forming of the batches.

The statistical processing of the data show that the difference between batches recorded at the end of the periods had a different degree of significance for the 1% thresholds, and that 5%.

The existence of these differentiations indicates a higher degree of precocity and a more accelerated rate after weaning in regards to corporal development at both batches of trisial hybrids.

Compared with the control batches where the determined efficiency at hot had values below 45% in the case of half breed batches S x (BL x Ti) and Texel x (BL x MP) this indicator presents the average values of 52.20% and 51.65%.

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