

Researches Related to Fattening Performances Achieved by Hybrids Issued from Romanian Sheep Breeds Crossed with Meat Type Rams

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ABSTRACT

The researches aimed to assess the fattening aptitudes of sheep youth belonging to some different sheep groups. Control groups included local sheep breeds - Merinos of Palas (M1) and Țigaie (M2), while the experimental treatments comprised weaned lambs, issued from Texel breed crossed with F1 hybrid females Bluefaced Leicester x Merinos of Palas (L1) and from Suffolk breed crossed with F1 hybrid females - Bluefaced L. x Țigaie (L2), respectively. Weaning has been done when lambs turned 85 days old. Intensive fattening technology was applied across a period of 90 days. The whole gain achieved by L1 lambs was 20.31% higher, compared to M1, while high degree of statistic significance ($p < 0.01$) occurred for the average daily gain values. The same analysis, between M2 and L2 groups revealed 37.87% higher live weight in L2 group. All the differences found between L1 and M1, between L2 and M2 respectively were statistically significant for $p < 0.01$ or $p < 0.05$. L2 group had an average final weight of 39.242 ± 0.258 kg, which was 43.65% cumulated during suckling period, respectively 56.35% during fattening. Feed conversion was found at 4.58 UFC for L1 and at 4.72 UFC in L2, these values being 21.44% better, respectively 20.13% better than M1 and M2. The data acquired when fattening ended suggested that hybrids synthesis and their rearing could be a more efficient way to improve sheep meat yield.

BIOLOGICAL MATERIAL

The biological material we used in researches was represented by certain groups of hybrids obtained from cross between half blooded mother ewes with rams belonging to certain breeds with very good aptitudes for meat production.

The performances achieved by the descendants were compared with those achieved by the groups comprising the lambs of maternal breeds, after fattening under the same condition of feeding and accommodation.

The control groups belonged to local breeds Merinos of Palas (M1) and Țigaie (M2), while the experimental groups were constituted of tri-racial hybrid lambs issued from cross between Texel rams with F1 hybrid females Bluefaced Leicester x Merinos of Palas (L1), respectively between Suffolk with F1 hybrid females Bluefaced Leicester x Țigaie (L2). Weaning of lambs has been done when they turned 85 days old.

WORKING METHODS

Applied fattening technology was of intensive type, lasted 90 days and comprised 3 stages (adaptation, growing and finishing). Throughout the fattening, a feed diet with an optimal structure was given to the fattened youth, in order to better exteriorise their productive performances. The given feed and feed wastes were weighted before and after intake, in order to calculate the daily consumption. Lambs were also weighted at the beginning and at the end of each stage, in order to calculate the whole weight gain, the daily weight gain and the feed conversion ratio.

In our assessments, the slaughtered lambs were fastened 12 hours, prior to slaughter, in order to avoid weighting errors. Carcasses were objective evaluated by carcass weight, dressed weight, physical structure, cut parts proportion and classifying on quality ranks, in accordance with EU norms. The cut parts were then de-boned, in order to establish the bones/meat ratio for the whole carcass and for each trenced region.

Data was processed through the REML method (REstricted Maximum Likelihood) which guarantees the achievement of some statistics within the normal parametric range.

RESULTS AND DISCUSSIONS

When milking and suckling ceased, three experimental groups have been established, in order to assess fattening performances. Weaning has been done when lambs turned 85 days old.

Live weight dynamics and the assessment of body mass gains were assessed through the weighting of all individuals, at the beginning and the ceasing of the 90 days intensive fattening. Data analysis revealed that growing intensity and fattening capacity were different among the groups. Therefore, they will be separately presented, compared with the local breed performances.

In Merinos of Palas breed, the differences between groups favoured the pure breed lambs, which weighted 2.749 kg more – distinguished significant difference for the 0.01 edge. The existence of this situation could be justified through the fact that the mother ewes from Merinos of Palas breed yielded more milk, therefore their lambs better valorised it toward the growing velocity. Similar situations were signalled by other Romanian authors (Ștefănescu, C., Radu, A. and Rarinca, C., 1975).

When fattening ceased, the situation was different. At that moment, the average weight of the control group (Merinos of Palas lambs) was 5.2% lower than that achieved by the tri-racial lambs, whose individual live weight passed over 40 kg at the moment. The specialty literature signalled other similar situations: Nasholm, A., in 1990, showed that Texel x Swedish Landrace hybrids achieved live weight of 34.200 kg, at 120 days old.

Table 1. Technical parameters achieved during the fattening period, in the groups issued from Merinos of Palas breed usage

Notice	Merinos of Palas		Texel x (BFL x MP)		Statistics
	$\bar{X} \pm s_{\bar{X}}$	V %	$\bar{X} \pm s_{\bar{X}}$	V %	
Weight at fattening onset (kg)	19.182 ± 0.8430	14.58	16.433 ± 0.2896	6.10	$\hat{F} (10.19954) > F_{\alpha} 0.01 (8.016627) **$
Weight at fattening ceasing (kg)	38.227 ± 1.0209	8.86	40.333 ± 1.0451	8.98	$\hat{F} (2.065197) < F_{\alpha} 0.05 (4.324789) ns$
Whole gain /cap (kg)	19.045 ± 0.7638	13.30	23.900 ± 1.0060	14.58	$\hat{F} (14.36032) > F_{\alpha} 0.01 (8.016627) **$
Average daily gain (g)	210.7 ± 8.5265	13.30	265.6 ± 11.1800	14.58	$\hat{F} (14.88003) > F_{\alpha} 0.001 (14.58648) ***$

Note: ns – not significant; * - significant; ** - distinguished significant; *** - highly significant.

In the beginning of fattening, the tri-racial lambs average live weight was 14.33% less than the pure breed ones. At the end of fattening, the hybrids were 5.22% heavier, compared to the control groups lambs, due to their higher precocity, expressed through their growing velocity. Under these circumstances, both daily weight gain and overall gain were higher in the tri-racial hybrids. Thus, the meat producing aptitudes were better expressed in these lambs, knowing that whole gain was 20.31% higher and daily gain was 20.67% higher, compared to the control group.

One of the characteristics presented in the experimental group – the aptitude to reach higher weights at lower ages (precocity) was also underlined by other authors (Dinescu, S., 1972; Ștefănescu, C., et al., 1975; Ionescu, A., Ursescu, A., Vicovan, G., 1985; Steng, G., 1986; Imangaliera, T.B., 1990; Luo, Y., Zhao, Y. 1991; Leymaster, K.A., Jenkis T.G., 1993). Variability indicated a certain degree of homogeneity, knowing that its average value were situated under 15%.

Țigaie breed constituted the maternal form of the hybrid mother ewes F1 (BL x Ti), that were subsequently mated with Suffolk rams, in order to produce tri-racial hybrids, specialised for meat production.

Data from table 2 reveal that local Țigaie lambs had better live weight (+8.64%) at the beginning of fattening, compared to the tri-racial hybrids average body weight.

As in Merinos of Palas breed, this state of facts could be justified through two reasons

- better milking capacity of the maternal breed, knowing that Țigaie breed was selected for milk yield;
- exteriorisation of different abilities for body weight development in youth categories, during suckling.

Therefore, in local breed, growing capacity was better during suckling period, while, in tri-racial lambs, the growing velocity was better expressed during the fattening period.

Thus, at the end of fattening, the experimental group presented 37.7% higher average live weight, compared to the control one. Statistical processing revealed significant differences between groups, at the final of the period, for the 1% and 5% edges.

Table 2. Technical parameters achieved during the fattening period, in the groups issued from Tigaie breed usage

Groups	n	Weight at fattening onset (kg)	Weight at fattening ceasing (kg)	Whole gain /cap (kg)	Average daily gain (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 \pm 0.705	32.521 \pm 0.511	13.736 \pm 0.254	152.621 \pm 0.350	
Suffolk x (BL x Ti)	12	17.130 \pm 0.467	39.242 \pm 0.258	22.112 \pm 0.562	245.68 \pm 0.213	
Tukey Test					d.	s.d.
Whole gain					8.37	**
Daily weight gain					93.05	**
Weight at fattening onset Tigaie - Suffolk x (BL x Ti)					1.65	*
Weight at fattening ceasing Suffolk x (BL x Ti) x Tigaie					4.721	**
$w_{5\%} = 1.75$; $w_{1\%} = 3.67$. Notice: *significant; ** distinguished significant						

The average daily gain values revealed the performances realised by the hybridised group, meaning 37.7% higher values, compared to the Tigaie youth group.

In both situations of crossings it was obviously observed the role played by the two used paternal breeds that are internationally recognised as improvers of those traits related to meat production.

In an experiment run in 1968, Kincaid, quoted by Mochnacs et al. (1978), alternatively used two groups of females from different breeds and two rams of different breed (high weight-Hampshire and high weight-Southdown) and found a statistically significant difference of 0.476 kg between the obtained lambs. It meant that the ram directly influenced the lambing weight and that the effect should be considered when crossing is judged.

Analysis of precocity degree for growing velocity of youth. The existence of certain differences between control and experimental groups could be due to the different precocity degrees, trait given by both meat type breeds - Blue Faced and Suffolk. The body development rhythm across both periods – suckling and fattening is revealed in fig. 1.

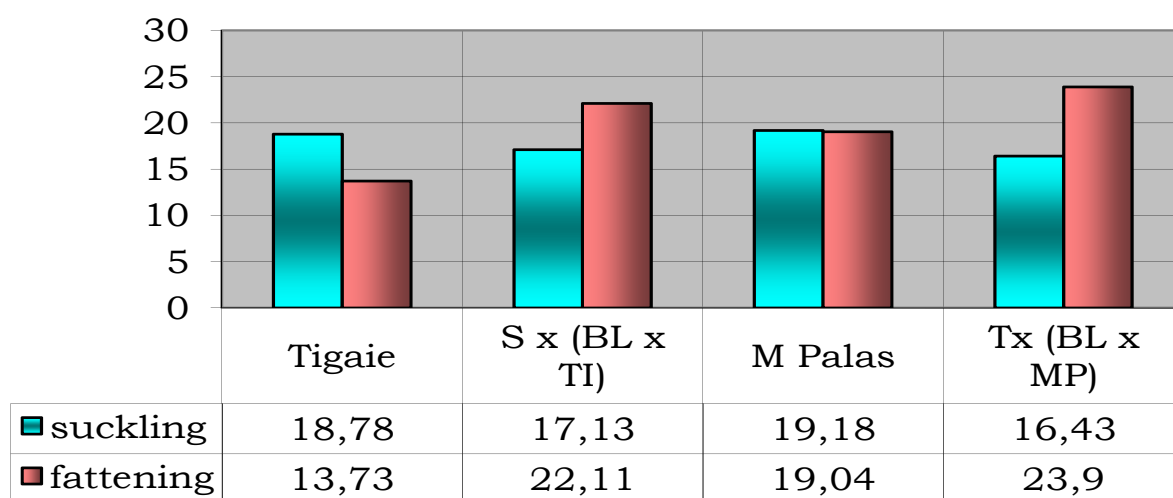


Fig. 1. Body development dynamics throughout the suckling and fattening periods

Studying the values achieved by the groups formed on the Merinos of Palas breed basis indicated that the control group gained 19.85% of final weight during suckling period, while the tri-racial hybrids achieved 16.43%

only, during the same period. The same analysis, run on the fattening period, revealed that the hybrid group gained 59.24% of the whole gain, while the proportion of muscular masses gain during the same interval reached just 50.88%.

The same assessments, run on the values achieved from the Tigaie and tri-racial lambs Suffolk x (BL x Ti) revealed different results. The group of Tigaie lambs presented higher growing rhythm during suckling period, gathering 57.76% of the final weight, while during fattening, the gain reached 42.24% of the final result.

The crossed group S x (BL x Ti) presented a final body weight of 39.242 ± 0.258 kg, while 43.65% was gained during suckling period and 56.35% during the fattening one.

The presence of these differentiations, even under the condition of maximal limitation of external factors influence, indicated that the practicing of this mating facilitated the issuance of a hybrid youth with very good qualities and very high fattening velocity.

Feed conversion represents an evaluation index for the fattening - meat production efficacy (Sandu Gh. 1993).

In our researches, the FC was expressed in UNC and revealed different values between the analysed groups (table 3 and table 4). Thus, from the analysis of the groups issued from crossings of Merinos of Palas local breed, there were found certain differentiations related to feed conversion for each kg of gain. Compared to the consumption assessed in pure breed lambs, the hybrids presented 21.44% better values for feed conversion, due to the highest precocity and to the better aptitudes for meat production.

Running of the same analysis in the groups based on Tigaie breed crossings indicated reduced values in the tri-racial individuals S x (BL x Ti). The difference between groups indicated that the one comprising hybrids had a feed conversion ratio 20% lower, compared to the control group, constituted of Tigaie youth.

Table 3. Assessment of feed conversion in the groups issued from Merinos of Palas breed usage

Notice	Merinos of Palas				T x (BL x MP)			
	Gross (kg)	UNC	PBDIN (g)	PDIE (g)	Gross (kg)	UNC	PBDIN (g)	PDIE (g)
Intake./cap/day	1.44	1.19	139.7	101.2	1.47	1.26	145.6	103.4
Intake./kg gain	6.81	5.83	660.6	478.8	5.52	4.58	535.5	388.2

Table 4. Assessment of feed conversion in the groups issued from Tigaie breed usage

Notice	Tigaie				S x (BL x Ti)			
	Gross (kg)	UNC	PBDIN (g)	PDIE (g)	Gross (kg)	UNC	PBDIN (g)	PDIE (g)
Intake./cap/day	1.52	1.26	147.5	106.9	1.47	1.26	145.6	103.4
Intake./kg gain	6.91	5.91	573.3	415.6	5.75	4.77	462.7	404.4

The higher feed conversion values, registered in indigenous populations were given by a better precocity degree in the hybrid groups, as well by their better aptitudes for meat yield.

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CONCLUSIONS

1. Despite the fact that during fattening onset, the group of Merinos of Palas lambs had 14.33% higher body weight than the Texel x (BFL x MP) group, at the end of fattening, the live weight of the hybrid group was 5.22% higher.

2. In the group of hybrids, the whole achieved gain across the fattening period was 20.31% higher, while the daily average gain was 20.67% higher, suggesting that the meat producing aptitudes were better exteriorised by the multi-breed hybrids.

3. Compared to the group comprising lambs of Țigaie lambs, the one issued from Suffolk x (BL x Ti) cross achieved, throughout the whole fattening period better and higher values of the weight gain, the difference being distinguished significant for $p < 5\%$.

4. The differences which occurred between control groups and the experimental ones indicate that the practicing of such mating favours the producing of a hybrid biological material, characterised through a very well rhythm of weight gain during fattening.

5. Compared to the feed conversion assessed in pure breed Merinos of Palas lambs, the hybrids achieved 21.45% lower consumption; the S x (BL x Ti) group realises 20% less consumption per kg gain than the Țigaie breed.

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