

COMPARATIVE RESEARCH ON THE APTITUDES FOR MEAT PRODUCTION OF THE FATTENING LAMBS OF LOCAL ROMANIAN BREEDS

Elena Ghită, Cristina Lazăr, Rodica Pelmus, Mariana Ropota

National Research-Development Institute for Animal Biology and Nutrition

Calea Bucuresti nr.1, 077015 Balotesti, Ilfov, Romania, e-mail: elena.ghita@ibna.ro

Introduction

Worldwide, the fattened lamb meat (15-22 kg carcass) is a major goal of sheep production of most developed countries and of the large wool producers. Although the Romanian consumers prefer the nursing lamb meat, the lambs should be slaughtered at higher body weights, obtaining thus larger amounts of high quality lamb meat, which increases producers' income. In Romania, sheep meat consumption still is quite low, with 10-12% of the overall meat consumption. The type of sheep meat depends, both as quantity and quality, on the age of animals at slaughter, which is closely related to traditions and consumer preferences. In terms of slaughtering age, there are two categories of lambs: suckling lambs and fattened lambs.

OBJECTIVE

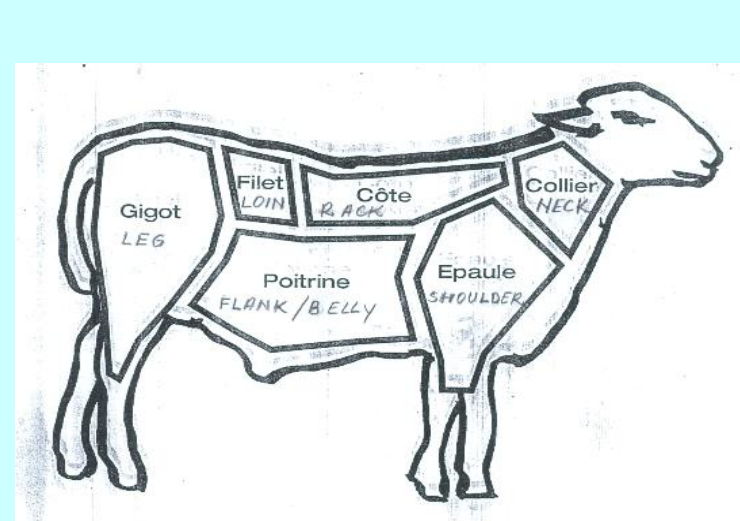
The purpose of this paper was to evaluate the meat production aptitudes of the fattening lambs from local Romanian breeds: Carabash, Tsigai and Tsurcana. The paper is part of a larger study on the quality of carcasses from suckling lambs, fattened lambs and adult animals, all from local breeds.

Material and Methods

The research was conducted at INCDBNA Balotesti on 48 lambs assigned to three groups of 16 lambs each, belonging to the following breeds: Carabash, Tsigai and Tsurcana. The experiment started after the lambs were weaned and After a period of accommodation to the experimental maintenance and feeding conditions, ended when the animal reached the target body weight of 37-40 kg. The animals were kept indoors under similar conditions of feeding and microclimate. The body weight of the animals was measured at the beginning and end of the fattening period, as well as the average daily gain for each breed. Eight lambs from each group were slaughtered at the end of the fattening period and the live weight and carcass weight were determined, as well as the slaughtering yield (slaughterhouse yield and commercial yield), proportion of carcass parts, meat to bone ratio, specific carcass measurements, gross chemical composition of the meat and fatty acids content. The carcase were cut according to the French methodology which has the following parts: leg, loin, rack, shoulder, flank, neck.



Tsigai and Tsurcana lambs



Carcass parts



Carabash lambs

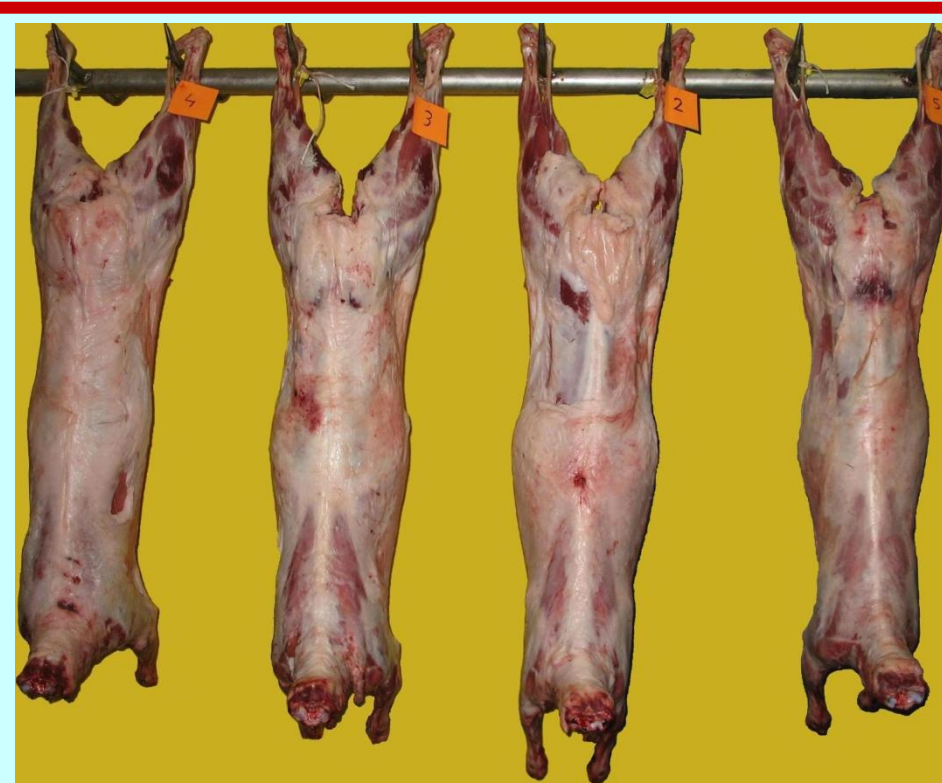
The lambs had at the beginning of the fattening period an average age of 76-83 days, but different body weights (due to the different breeds, which required different lengths of the fattening period function of the weight gain of each breed). The experiment ended when the lambs reached a live weight of 37-39 kg. The lambs were fed on alfalfa hay and compound feed. The intake of feed units per kg of gain was calculated in the end of the experiment (feed conversion ratio). Table 1 shows the results of the fattening period.

Synthetic data on lamb fattening

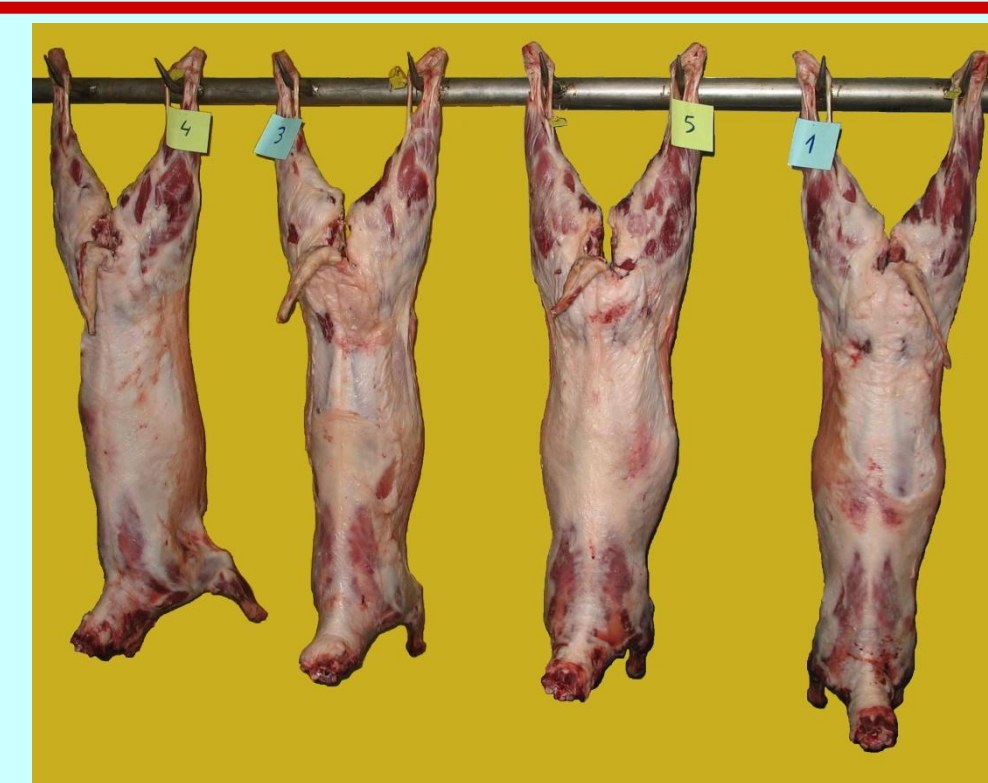
	Carabash		Tsigai		Tsurcana	
	X Sx	Cv%	X Sx	Cv%	X Sx	Cv%
Live weight at the beginning of the experiment (kg)	27.15 1.048	12.215	20.7 0.345	5.579	21.27 0.401	5.963
Live weight at the end of the experiment (kg)	38.46 1.178	9.691	37.9 0.332	1.957	39.2 0.888	5.070
Weight gain during the period (kg)	11.31 0.716	20.043	15.3 1.173	24.24	13.98 1.293	29.256
Duration of the fattening period (days)	44		86		91	
Average daily gain (kg)	0.258 0.016	20.359	0.178 0.014	24.25	0.154 0.0142	29.330

Conclusions

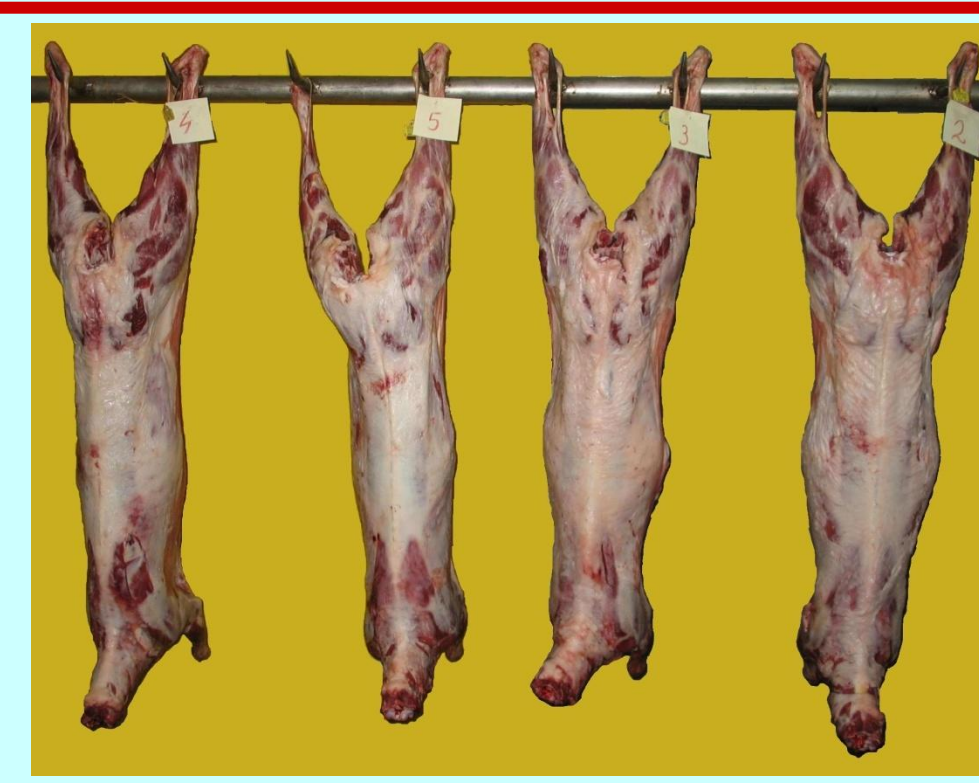
Results and discussion



Carabash lambs carcass



Tsigai lambs carcass



Tsurcana lambs carcass

Live weight, slaughtering yield and proportion of suckling lambs carcass parts

		Carabash		Tsigai		Tsurcana	
		$\bar{X} \pm S_{\bar{x}}$	Cv%	$\bar{X} \pm S_{\bar{x}}$	Cv%	$\bar{X} \pm S_{\bar{x}}$	Cv%
Live weight (kg)		38.4 2.141	12.469	37.9 0.332	1.957	39.2 0.888	5.070
Carcass weight (kg)		18.0 1.218	15.175	15.84 0.221	3.112	14.8 0.682	10.303
Slaughterhouse yield %		46.656 0.992	4.7548	41.82 0.847	4.529	37.698 1.106	6.559
Commercial yield %		51.791 0.883	3.81	46.823 0.946	4.515	42.812 1.188	6.208
Head	kg	1.495 0.036	5.485	1.449 0.084	12.995	1.543 0.026	3.769
	%	3.943 0.248	14.0862	3.820 0.203	11.881	3.942 0.084	4.769
Organs	kg	1.960 0.110	12.597	1.898 0.072	8.5192	2.010 0.105	11.731
	%	5.133 0.275	11.989	5.008 0.189	8.4372	5.114 0.155	6.756
Full digestive tract	kg	8.566 0.452	11.815	9.076 0.495	12.190	10.620 0.597	12.579
	%	22.354 0.611	6.1139	23.948 1.299	12.124	27.059 1.180	9.753
Empty digestive tract	kg	3.551 0.221	13.953	3.332 0.102	6.818	3.171 0.267	18.814
	%	9.235 0.098	2.3718	8.801 0.334	8.485	8.074 0.593	16.428
Hide	kg	4.974 0.395	17.793	5.544 0.346	13.964	6.473 0.180	6.213
	%	12.915 0.482	8.3498	14.610 0.836	12.80	16.556 0.663	8.956
Legs	kg	0.944 0.049	11.619	0.716 0.007	2.175	0.858 0.022	5.674
	%	2.469 0.096	8.6581	1.890 0.034	4.0094	2.191 0.055	5.570
Losses	kg	2.501 0.184	16.491	3.376 0.173	11.454	2.896 0.282	21.809
	%	6.527 0.393	13.461	8.903 0.4249	10.673	7.440 0.824	24.770

Testing the significance of differences between the three breeds

Trait	Fisher test	Tukey test	Observations
Live weight at slaughter	$F_{\text{tabular}} > F_{\text{calculat}}$ 3,88 > 0,23	-	NS (no significant differences)
Carcass weight	$F_{\text{tabular}} < F_{\text{calculat}}$ 3,88 < 3.89	3.076 < 3.2	* Signif. diff. Carabash Tsurcana NS Carabash - Tsigai NS Tsigai - Tsurcana
Slaughter-house yield	$F_{\text{tabular}} < F_{\text{calculat}}$ 3,88 < 20.65	3.718 < 8.96 3.718 < 4.84 3.718 < 4.12	* Signif. diff. Carabash Tsurcana * Signif. diff. Carabash - Tsigai * Signif. diff. Tsigai - Tsurcana
Commercial yield	$F_{\text{tabular}} < F_{\text{calculat}}$ 3,88 < 19.79	3.815 < 8.978 3.815 < 4.965 3.815 < 4.014	* Signif. diff. Carabash Tsurcana * Signif. diff. Carabash - Tsigai * Signif. diff. Tsigai - Tsurcana

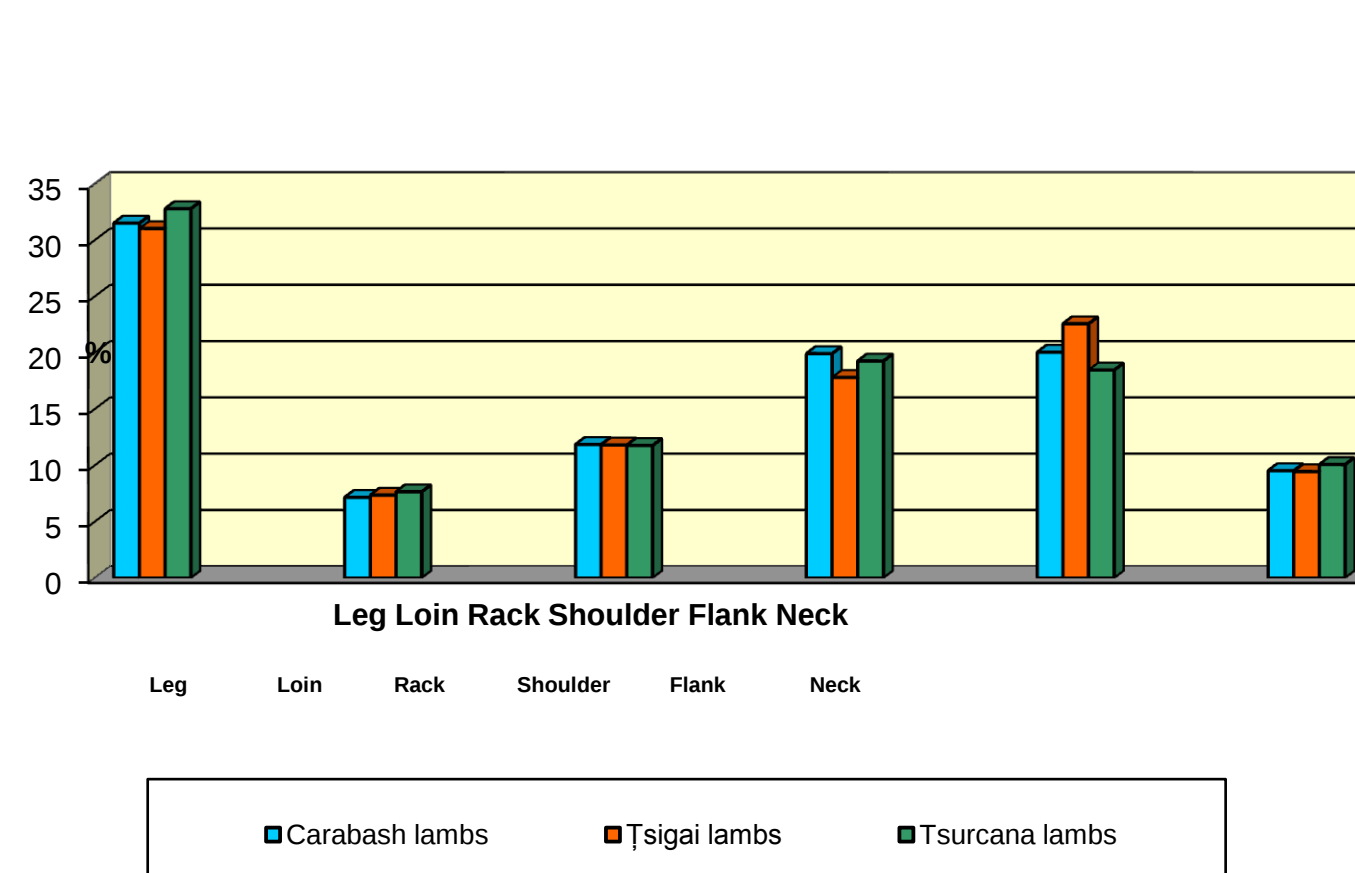
Meat to bone ratio

	Carabash lambs	Tsigai lambs	Tsurcana lambs
Meat to bone ratio	2.32 : 1	2.63 : 1	2.10 : 1

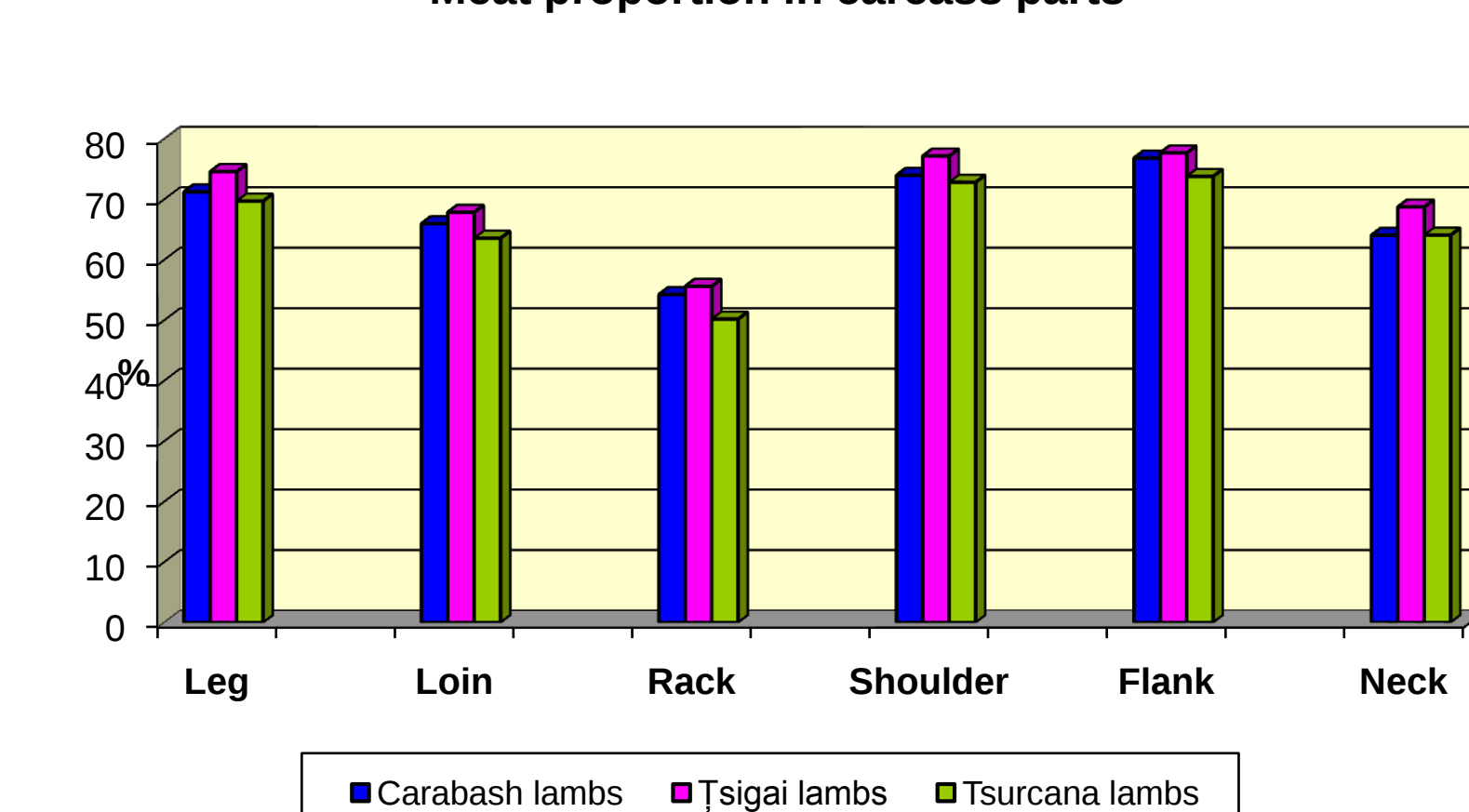
Carcass measurements (cm)

	Carabash		Tsigai		Tsursana	
	$\bar{X} \pm S_{\bar{X}}$	Cv%	$\bar{X} \pm S_{\bar{X}}$	Cv%	$\bar{X} \pm S_{\bar{X}}$	Cv%
Large trunk length	77.4 2.249	6.499	70.0 1.789	5.714	77.2 1.594	4.616
Small trunk length	64.4 2.015	6.996	60.0 0.949	3.536	63.8 1.655	5.806
Inner length of the leg	28.4 0.510	4.015	22.8 0.490	4.805	26.2 0.583	4.977
Outer length of the leg	52 1.347	5.769	43.6 0.927	4.756	48.2 1.020	4.731
Carcass width at the leg	16.7 0.970	12.982	16.2 0.374	5.164	14.2 0.583	9.182
Thorax width	22.9 1.054	10.288	21.6 0.510	5.279	20.8 0.917	9.853
Breast width	18.5 0.548	6.620	17.2 0.200	2.600	16.4 0.245	3.340
Thorax depth	26.5 0.548	4.622	26.6 0.510	4.286	26.8 0.374	3.122
Thorax perimeter	73.2 2.764	8.444	67.2 1.020	3.393	67.0 0.894	2.985
Thigh perimeter	40.6 1.631	8.983	36.4 0.812	4.99	37.0 1.000	6.043

Proportion of lamb carcass parts



Meat proportion in carcass parts



- The Carabash lambs were the most precocious in terms of weight gain, with an average daily weight gain of 0.258 ± 0.016 kg over 44 days, reaching a slaughter weight of 38.46 ± 1.178 kg.
- The Tsigai lambs, less precocious than the Carabash lambs, had an average daily weight gain of 0.178 ± 0.014 kg over 86 days, reaching a slaughter weight of 37.16 ± 0.130 , with a feed conversion ratio significantly higher than in the Carabash lambs (6.35 FU compared to 4.66 FU in Carabash).
- The Tsurcana lambs were the slowest as fattening, reaching over 91 days an average daily weight gain of 0.154 ± 0.014 kg, reaching a slaughter weight of 39.2 ± 0.888 kg with a feed conversion ratio of 6.44 FU.
- The Carabash lambs had the highest commercial yield, 51.79%, followed by the Tsigai (46.82%) and Tsurcana (42.81%) lambs.
- The Tsigai lambs had the best meat to bone ratio (2.63/1), followed by the Carabash (2.32/1) and Tsurcana (2.10/1) lambs.
- The Tsigai lambs had the highest level of polyunsaturated fatty acids (favourable to human health). The Carabash lambs had the lowest cholesterol level and the Tsigai lambs had the highest cholesterol level.
- The results show that of the three tested breeds, the Carabash breed is best suited for the production of fattened lambs. Even if the aptitudes for meat production of the Romanian breeds are not at the level demanded by the international market, work has to be done to increase the meat percentage and to decrease the bone and fat percentage. A solution to produce high quality carcasses is to cross the local ewes with rams from a breed specialized in meat production and use the hybrids for meat production.