

## CAPACITIES OF FATTERING OF MOLDOVAN KARAKUL LAMBS

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### Abstract

To study the fattening capacities of young ovine of Moldovan Karakul breed, five lambs and five female lambs were intensively fattened for 60 days. Were studied body fat indexes and carcasses, were determined the slaughter yield, the bone ratio: meat, the chemical composition of the meat.

It has been determined that the average daily increase over a fattening period is  $256.8 \pm 21.34$  g at lambs and  $201.6 \pm 7.37$  g at female lambs. Body indexes such as: lateral corporal format, massiveness, robustness increased at lambs and female lambs respectively by 2.2 and 2.2%, 3.8 and 5.8%, 1.3 and 3.6% respectively. But differences between lots are not veridical ( $P > 0.1$ ).

The yield of killing lambs constituted 49 % of body weight before sacrificing of 38.34 kg. Appraisals of the carcass of lambs allow us to conclude that the jig form and pulp development are at the level of mixed breeds, and the carcass compaction is satisfactory. The bone ratio: meat on the entire carcass constituted 1: 3.39. Analyzing these data, we can say that young ovine of Moldavian Karakul breed in intensive fattening conditions show good fattening capacities.

**Key words:** Fattening, youth karakul, yield at slaughter

### INTRODUCTION

In the Republic of Moldova about 250-300 thousand of Karakul sheep breed and her mestizos are raised and exploited. The main product of these animals is the pelt, which in the last 3-5 years lost its value on the commercialization market of the country. For this reason, sheep owners are aiming to increase and improve the production of milk at this breed, meat that is quite demanded both on the internal and external market. To increase the production of milk, crossbreeds are made with similar breeds such as the Awassi breed, especially rams crossing with native sheep. In order to increase meat production, special breeds such as Suffolk, Texel, etc. are imported, but which are not acclimated to the pedo-climatic conditions of the republic and obviously cannot fully realize their genetic potential. In this context, research was carried out at SPIBZMV on the capacity to fatten the local Karakul Moldovan breed.

### MATERIAL AND METHODS

The research was carried out at TER (the technical-experimental resort) "Maximovca". Were evaluated the growth and development of lambs by individual weights with precision of 0.1 kg during different periods: at birth, 90-100 days (weaning), at the beginning and end of the experiment, calculating the total and daily average gains. The experience was done according to the scheme.

After weaning, the lambs were fattened under the usual conditions, at the lairage being fed with lucerne and concentrates in the amount of 200 g / head / day as granules. The duration of the growth and fattening control was 60 days. At the beginning and end of the growth and fattening period, lambs were subjected to body development by somatometric measurements (cm) after the following indexes: height at withers and croup, oblique length of trunk, breadth

On the basis of the measurements, the body indicators (%) were calculated: limb height, body length, thorax, excessive growth, robustness, bone and body width and depth of thorax, thorax perimeter, shin perimeter, taken with the necessary tools

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according to generally accepted methods in zootechny.

After the end of the control period, all five lambs were sacrificed. In the control slaughter were studied: fattening (live and carcass), hot and chilled carcass mass (kg), slaughter yield (%). The specific measurements of the carcass (cm) were studied according to the following indices: the long and the smallest length of the carcass, the internal and external length of

the jig, the width of the carcass at the jig, the width of the carcass at the thorax, the width of the carcass at the shoulders, the depth of the thorax, the depth of the basin, the perimeter of the jig, the perimeter of the thorax. Were calculated carcass indexes (%): the index of the carcass format, jig format index, carcass compactness index, carcass uniformity index, pulp development index, thorax depth index, jig proportionality index [2,3,4].

Table 1 Scheme of experience

Specifications	Experimental groups of Karakul lambs	
	lambs	female lambs
Number of animals in the group	5	5
Individual weighing of the lambs	At birth	
	At age of 90 days (weaning)	
	At the beginning of the experience (at the age of 115 days)	
	At the end of the experience (at the age of 175 days)	
Somatometric assessment of the exterior (corporal measurements)	At the beginning of the experience	
	At the end of the experience	
Control slaughter		
Assessment of carcass quality	5	-
Determination of composition of carcass tissue (half-carcass)	5	-

The lambs carcasses were subjected to cutting according to the requirements in vigor and was determined the proportion of the portions on the quality of the meat and the tissue composition of the carcass after boning. As a result, the bone ratio was calculated: meat and the percentage of cuts of the half-carcass.

The average chemical analysis of the meat samples obtained from the half-carcass boning according to the indices - water, fat, protein and collagen was determined on the Cagle lab's apparatus.

The data obtained were biometrically processed using the "STATGRAPHICS Centurion XV" program, and the degree of certainty was determined according to the Student criterion (N. Plohinskii [5]).

## RESULTS AND DISCUSSIONS

For the creation of the experimental groups were selected from the birth 5 lambs

and 5 female lambs with an average body mass of  $5.84 \pm 0.44$  and  $5.12 \pm 0.05$  kg respectively (table 2). Following the growth of lambs from birth to weaning on the lot of lambs was obtained an average total increase of  $16.96 \pm 0.52$  kg and at female lambs this increase was of  $16.76 \pm 0.52$  kg. The average daily gain at lambs was 188.4 grams and at female lambs 186.2 grams respectively. For 3 weeks the animals were prepared for experimentation and at the beginning the lambs had a mean body weight per a lot about  $26.78 \pm 0.47$  kg. Female lambs in their turn had an average body mass of  $23.76 \pm 0.61$  kg. During the 60-day fattening period, the lambs received the rations according to the requirements and the rules and the ingestion of the food. At the end of the experiment it was found that the average body mass of the lambs on the lot was  $42.7 \pm 0.61$  kg and at female lambs respectively  $32.26 \pm 0.46$  kg.

Table 2 Dynamics of body mass of karakul lambs

Specification	Lambs	Female lambs
Body mass at (kg):		
birth	5.84±0.44	5.12±0.05
weaning (90 days)	22.68±0.25	21.24±0.62
Total increase, kg	16.96±0.52	16.76±0.52
Average increase per day, g	188.4	186.2
Body mass of the experience at (kg):		
the beginning (115 days)	26.78±0.47	23.76±0.61
the end (175 days)	42.70±1.75	36.26±0.97
Total increase, kg	15.92±1.63	12.5±0.46
Average increase per day, g	256.80±21.34	201.60±7.37

Analyzing the data obtained we can see that from the time of birth to weaning the average daily increase at both lambs and female lambs does not differ essentially being about 188 and 186 g. During the period of experience, under intensive growth conditions, we can see that the daily average increase at lambs was of  $256.8 \pm 21.34$  g, and at female lambs respectively  $201.6 \pm 7.37$ g. During the entire period of the experience (for 60 days), the body weight of the lambs increased by  $15.92 \pm 1.63$  kg, representing 59.4%, and at female lambs by  $12.5 \pm 0.46$  kg or 52.6 %. From bibliographic data[1] it is known that the average daily increase at male ovine youth over a 60-day of fattening period at the breed of Merinos de Palas was of 200.1 g at the Palas meat population respectively 228.5 g at the prolific population of Palas is of 208.16 g and at the Tigay breed of 170.5 g. Analyzing the obtained data and comparing it with other

authors we can conclude that in intensive conditions the young Moldovan Karakul breed shows increased fattening capacities with priority to lambs.

Following somatometric measurements were calculated the body indexes of the youth at the beginning and end of the experience (table 3).

From the data presented we can see that the lateral corporal form of both lambs and female lambs increased during the experimental period by 2.2%. Massive indexes at lambs rose by 2.2% at the end of the experience compared with the experience at the beginning of the experiment. At female lambs there is an increase of this index by 5.8%. Similarly, a priority of the index of robustness at female lambs was found, which constituted 3.6%, and at lambs it constituted 1.3%. These indices tell us of a more intense increase at female lambs during the evidence period. Differences between lots are not veridical ( $P > 0.1$ ).

Table 3 Body Mass Index (%)

Specification	Karakul Breed					
	M±m	$\sigma$	Cv, %	M±m	$\sigma$	Cv, %
<b>Lambs</b>						
	Beginning of the experience			The end of the experience		
Body shape lateral	102.70±2.22	4.95	4.82	105.00±1.09	2.43	2.32
Body shape transversal	38.84±2.22	4.97	12.81	34.17±0.83	1.87	5.46
Massiveness	128.58±2.65	5.93	4.61	133.42±5.26	11.77	8.82
Thoracic	78.06±1.07	2.40	3.07	70.93±1.17	2.63	3.70
Robustness	125.47±4.22	9.44	7.53	127.15±5.34	11.94	9.39
Bones	13.62±0.24	0.53	3.87	11.50±0.27	0.61	5.32
<b>female lambs</b>						
	Beginning of the experience			The end of the experience		
Body shape lateral	104.22±0.91	2.03	1.95	106.55±2.26	5.05	4.74
Body shape transversal	36.52±1.06	2.37	6.50	37.60±1.34	3.00	7.99
Massiveness	133.35±2.08	4.64	3.48	141.18±2.20	4.93	3.49
Thoracic	80.18±2.45	5.48	6.83	76.80±1.50	3.34	4.35
Robustness	128.01±2.60	5.81	4.84	132.58±1.25	2.79	2.11
Bones	14.20±0.22	0.50	3.49	11.33±0.25	0.55	4.90

Following the slaughter of the lambs (after 24 hours of nutrition retention), the main slaughter index was determined and the cutting yield was calculated. It was found that the lambs had body mass before sacrificing of 38.34 kg, and the cutting yield, calculated individually for each animal, averaged 49.0%. It should be noted that the mass of the chilled carcass was calculated

without the fat from the tail. According to the bibliographic data, cutting yields in mixed reeds vary between 42 and 45%, and in the specialized ones between 60 and 65% [3].

As we can see in this case, the yield is quite satisfactory and the carcasses are well dressed in the muscles as shown in Fig. 1 and in Fig. 2 at half-carcass.



Fig. 1 Carcasses of lambs fattened at the age of 175 days



Fig. 2 Half-carcass of lambs

As a result of the basic measurements of the carcasses, carcass indexes were calculated. The carcass indexes of lambs (%) are: carcass format –  $31.39 \pm 0.46$ ; of the jig format –  $53.12 \pm 0.6$ ; carcass compaction -  $89.51 \pm 1.36$ ; carcass uniformity  $78.12 \pm 0.95$ ; pulp development -  $129.1 \pm 2.64$ ; of the thorax depth -  $33.82 \pm 0.16$  and the proportion of the jig -  $62.26 \pm 1.45$ . From the data presented we can see that the jig form and the pulp development are at the level of mixed breeds, and the compactness of the carcass is satisfactory. Only the carcass uniformity indices are lower compared with mixed breeds.

Cutting the carcass and boning the half-carcass allowed the study of the development

of trade part of the carcasses. The carcass mass was 18.86 kg and the half-carcass  $9.43 \pm 0.49$  kg respectively. Following deboning, 13,392 kg of meat and 3,952 kg of bones were obtained from the carcasses. The bone / meat ratio on the entire carcass was 1: 3.39. But it is necessary to mention that at the breed karakul a considerable mass represents the fat in the tail, which in calculus was not taken. The deboning of the commercial parts of the carcass proved that the jig represents the main part of the carcass by 35.35% and in which the bone ratio: meat was 1: 3.97 (tab.4). Another part of the carcass such as saddle represents 6.89% of the carcass and bone ratio: meat was 1: 3.92.

Table 4 Share of portions of cuts in the semi-carcasses of the slaughtered youth

Specification	M±m	Specification	M±m
Jig, kg	6.668±0.29	Chest, kg	1.236±0.06
- meat	4.110±0.15	- meat	0.924±0.04
- bones	1.034±0.02	- bones	0.310±0.02
- bone / meat ratio	1:3.97	- bone / meat ratio	1:2.98
-% of the carcass	35.35	-% of the carcass	6.55
Saddle, kg	1.300±0.05	Square.	
- meat	1.034±0.04	discovering, kg	1.006±0.05
- bones	0.264±0.02	- meat	0.692±0.03
- bone / meat ratio	1:3.92	- bones	0.314±0.02
-% of the carcass	6.89	- bone / meat ratio	1:2.20
		-% of the carcass	5.33
Thread, kg	1.780±0.05	Spat, kg	3.388±0.08
- meat	1.508±0.05	- meat	2.632±0.06
- bones	0.270±0.01	- bones	0.758±0.02
- bone / meat ratio	1:5.59	- bone / meat ratio	1:3.47
-% of the carcass	9.43	-% of the carcass	17.96
Square covered,		Neck, kg	1.504±0.09
kg	1.976±0.05	- meat	1.062±0.05
- meat	1.420±0.04	- bones	0.442±0.05
- bones	0.554±0.01	- bone / meatratio	1:2.40
- bone / meat ratio	1:2.56	-% of the carcass	7.97
-% of the carcass	10.47		

The other parts of the carcass such as the thread, covered square, the chest, the uncovered square represent 9.4; 10.5; 6.5 and 5.3% of carcass bone ratio: meat is 1: 5.59; 1: 2.56; 1: 2.98 and 1: 2.2 respectively. Spat and throat are good commercials and together they represent at karakul lambs 25.94% of the carcass, and bone ratio: meat is 1: 3.85. At young ovine male of 7 months [2], the neck and back represent 27.34% and the bone ratio: meat 1: 3.9. Analyzing these data, we

can say that Karakul young ovine have good fattening capacities that allow to 175 days of age to have sufficient slaughter yield on commercial parts of the carcass and 49% in the whole.

After deboning, medium homogenized meat samples were collected from each carcass and the chemical composition was determined. Research has shown that the amount of water in the meat constitutes  $66.66 \pm 0.48\%$ , fat -  $14.66 \pm 0.55\%$ , protein -  $17.06$

$\pm 0.18\%$  and collagen -  $1.60 \pm 0.04 \%$ . According to R. Mayer et al. 1977 [2] at the youth of Turcana breed with a live weight of 30 kg, the amount of water in the meat is 62.97%, the protein 16.9%, the fat 17.98% and the mineral salts 2.17%. If we compare with the data obtained in our experience, we observe that the quantity of water tends to increase, but according to data of professor V. Taft, the amount of water in the composition of the meat of youth of 6 months constitutes from 71.6 to 75.3%. So in our case the obtained indices fall within the permissible limits. After the amount of protein in relation to the first bibliographic source we notice that it is at the same level of about 17.0%, and after Taft that indicates at 20.38% is lower. This fact can be explained that the age of the karakul lambs is smaller. But the amount of fat in meat is lower at karakul lambs and constitutes 14.66%, and according to Mayer respectively 17.98% [2].

## CONCLUSIONS

In intensive conditions of growing of young ovine of Moldovan Karakul breed show good fattening capacities. The average daily gain over a 60-day period is  $256.8 \pm 21.34$  g for lambs and  $201.6 \pm 7.37$  g for female lambs. Body indexes such as: lateral corporal format, massiveness, robustness increased at lambs and female lambs respectively by 2.2 and 2.2%, 3.8 and 5.8%, 1.3 and 3.6% respectively. But differences between lots are not veridical ( $P > 0.1$ ). The slaughter of the male youth showed that on average the cutting yield constituted 49% of the body weight before sacrificing 38.34 kg. Indices of appreciation of the lambs carcasses allow us to conclude that the jig form and pulp development are at the level of mixed breeds, and the carcass compaction is satisfactory. Only the carcass uniformity indices are lower in relation to mixed breeds. The bone / meat ratio on the entire carcass was 1: 3.39. But it is necessary to mention that in the breed karakul a considerable mass represents the fat in the tail, which in calculus was not taken.

The study of the chemical composition of the meat showed that the protein content of

$17.06 \pm 0.18\%$ , fat of  $14.66 \pm 0.55\%$ , collagen -  $1.60 \pm 0.04\%$  and water of  $66.66 \pm 0.48\%$  fall within the permissible limits and correspond to the results of other authors.

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