

# RESEARCH ON GROWTH RATIO OF F1 LAMBS OBTAINED FROM MATING RAMS SPECIALIZED IN MEAT PRODUCTION WITH REFORM FEMALES KARAKUL OF BOTOȘANI

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## Abstract

Research on body size, body weight and growth rate of F1 lambs obtained from mating specialized breeders for meat production with reform female Karakul of Botoșani was carried out by determination from birth, after identifying the lambs. The measurements were performed at birth, at 30 days, at 90 days and 180 days.

Measurements were made for body dimensions of F1 lambs in terms of height at the withers, height at the back, chest circumference and depth of the thorax. These measurements were performed within the reference time intervals, respectively at birth, at 30 days and at 90 days.

The processing of obtained data was performed with the help of computer calculation application MsExcel 2007. Also, for the statistical processing of obtained data was used the algorithm Analysis of variables (ANOVA Single Factor) included in the MsExcel package. Also, ANOVA makes a clear introduction in the causal analysis: the cause variable (independent) is the qualitative one and the effect variable (dependent) is the metric one.

In order to highlight the results obtained in terms of meat production skills of F1 lambs obtained by mating females of the Karakul de Botoșani breed with specialized breeders for meat production, the results were compared with those obtained by the lambs of Karakul de Botoșani breed.

**Key words:** growth ratio, body indices, lambs, Karakul of Botoșani

## INTRODUCTION

The Karakul of Botoșani sheep belong to a breed specialized in production of pelts, but the performance related to the meat production of this sheep breed should not be neglected due to the well-established characteristics for this production. Due to the current global trend of increasing consumer demand for meat production but also due to the decrease in demand for the pelts production, it is estimated that the reorientation towards meat production of Karakul of Botoșani sheep is a sustainable solution for the current context.

The researches were carried out in the unit where the breed Karakul of Botoșani was created, respectively "Research and Development Unit in the Breeding of Sheep

and Goats-Popăuți from Botoșani". Due to the current trend of decreasing market demand for pelts production both nationally and internationally, the Karakul of Botoșani breed improvement program should include specific meat production objectives to maintain local and regional importance of sheep belonging to this breed.

## MATERIAL AND METHOD

The biological material studied during the research is represented by the F1 lambs obtained in 2021 within the Research and Development Unit in Breeding Sheep and Goats-Popăuți Botoșani by crossing rams of the Palas Meat Breed with reform females of the Karakul of Botoșani breed. The Karakul of Botoșani females used for crossbreeding with the specialized breed for meat production no longer meet the research criteria for the production of pelts.

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The assessment of body weight was made with the help of the electronic scale, measurements and assessments of the body development of the F1 lambs were also performed. All measurements were performed after a 12-hour fasting period in which the access of individuals in the study group to food sources was restricted, thus avoiding the errors occurrence caused by food consumption.

Two study groups were formed, L1 study group consisting of F1 lambs obtained from the mating of specialized breeders for meat production with reform female Karakul of Botoșani and the L2 study group consisting of lambs belonging to the Karakul of Botoșani breed. The study lots were maintained in similar conditions in terms of technological factors that may influence the growth and development.

The data obtained during the analysis period were centralized with the help of the application MsExcel 2007, with the help of which the corresponding variation strings were drawn up, within which each one was

coded according to the specifics of the analysed parameters.

## RESULTS AND DISCUSSIONS

During the study period, the young lambs were kept in semi-intensive growth conditions, where the products are maintained in the stable within the unit where they are given a food supplement consisting in a mixture of cereals. One of the best methods of managing lambs in sheep-breeding units is year-round stable maintenance with the best quality fibrous feed from the stock. The application of this growth system ensured, during the study period, a high growth ratio, low mortality and a low number of individuals with pathological diseases. The herds benefit first of all from the comfort offered by the shelters during the periods with unfavourable or hot weather and from an ad-libitum water source.

According to the experimental protocol, measurements were performed for body weight of F1 lambs during lambing, the data obtained are presented in table 1.

Table 1 Weight at birth of F1 products

Category	Number	Total weight	Average birth weight	Variation
F	91	410 kg	4.51 kg	0.337477411
M	80	365 kg	4.56 kg	0.379669304

By analysing the data presented in Table 1, it can be stated that in terms of calving weight of F1 lambs, that males in group L1 have an average weight of 0.5 kg higher than females in the group with a variation index of 0.37 for males and 0.33 for females.

In order to assess the body weight of F1 individuals in the study group at 30 days, the electronic scale was used, the data are presented in Table 2.

Table 2 Weight at 30 days of F1 products

Category	Number	Total weight	Average 30 days weight	Variation
F	91	1163 kg	12.78 kg	0.285875687
M	80	1003 kg	12.54 kg	0.245155467

As we observe by analysing the data presented in table 2, it can be stated that the males in the group had a lower average weight by 0.24 kg compared to the females in group L1, having a variance index of 0.28 for the females respectively. 0.24 for males.

The assessment of the body weight of the individuals within the L1 group at the age of 90 days was performed using an electronic scale, the data obtained are presented in table 3.

Table 3 Average weight at 90 days F1 products

Category	Number	Total weight	Average 90 days weight	Variation
F	91	2324 kg	25.54 kg	0.273564547
M	80	2053 kg	25.66 kg	0.261358289

By analysing the data presented in Table 3, it can be stated that the males in the group had a body weight with 0.12 kg higher than the females in the analysed group, with a variance index of 0.28 and 0.27 for females in the group.

In order to highlight whether a slightly improved alimentation has an influence on

the growth of the lambs obtained by mating specialized breeders for the meat production of reformed sheep from the Karakul of Botoșani breed, the results obtained from performing body measurements of F1 individuals in 2021 were analysed and compared to those obtained in 2020, for both males and females.

Table 4 Average values of individual body measurements F1 lambs 2020 and 2021

F1 Products		2021		2020		Difference	
		F	M	F	M	F	M
At birth	Height at the withers (cm)	39.36	39.79	37.54	37.98	1.82	1.81
At 30 days		49.76	49.86	48.12	48.56	1.64	1.3
At 90 days		56.14	58.43	55.85	57.25	0.29	1.18
At birth	Height at the croup (cm)	37.96	38.51	36.86	37.85	1.1	0.66
At 30 days		49.03	49.12	47.85	48.08	1.18	1.04
At 90 days		58.1	58.97	57.14	58.8	0.96	0.17
At birth	Chest circumference (cm)	36.28	36.81	34.56	35.25	1.72	1.56
At 30 days		54.86	54.6	52.76	52.89	2.1	1.71
At 90 days		70.58	71.24	67.8	69.28	2.78	1.96
At birth	Depth of the thorax (cm)	16.86	17.93	16.62	17.54	0.24	0.39
At 30 days		23.81	23.71	21.82	21.75	1.99	1.96
At 90 days		30.28	31.06	28.4	29.57	1.88	1.49

As we observe by analysing the data presented in table 4 with the average value of body measurements, it can be seen that the height at the withers of the F1 individuals within the group in 2021 is higher compared to that obtained in 2020. Males obtained values by 1.81 cm higher at birth and females by 1.82 cm. This difference was maintained throughout the analysed period, reaching 90 days at only 0.29 cm for females and 1.18 cm for males.

Also, in terms of data on the height of individuals at the back, the average values showed a difference in the two years

analysed, so females obtained at birth a value with 1.10 cm higher in 2021, also males recorded an increase by 0.66 cm. The differences between the two years analysed were maintained for all reference intervals but their value is less significant reaching 90 days at 0.96 cm for females and 0.17 cm for males.

By analysing the data presented in table 4 regarding the thoracic perimeter of F1 products, it can be stated that the average value of the thoracic perimeter is higher in F1 products in 2021 compared to products in 2020, so in terms of birth values, females

recorded a difference of 1.72 cm and males a difference of 1.56 cm. This difference was present in the reference intervals, reaching the age of 90 days at a value of 2.78 cm for females and 1.96 cm for males in the group.

Regarding the thorax depth data obtained during the analysed period, a difference can be observed between the two analysed years. Regarding the values obtained at birth by F1 products, a value by 0.24 cm higher for females and 0.39 cm for males was

highlighted. This difference in thorax depth was maintained throughout the analysed period, reaching 90 days to record a difference of 1.88 cm for females and 1.49 cm for males.

In order to highlight the skills for meat production of F1 products obtained by mating reformed Karakul of Botoşani sheep with rams specialized for meat production, table 6 was prepared in which body indices are presented at the age of 180 days of the lambs.

Table 5 Body indices 180 days Batches L1 and L2

Age	Body indexes	Lot L1		Lot L2		Difference between the average values	
		F1 Products		Karakul of Botoşani			
		F	M	F	M	F	M
180 days (cm)	Height at the withers	59.95	60.24	61.24	61.98	-1.29	-1.74
	Height at the croup	64.52	65.21	63.27	64.85	1.25	0.36
	Chest circumference	86.37	87.58	82.34	84.29	4.03	3.29
	Depth of the thorax	36.78	37.41	35.27	36.48	1.51	0.93

By analysing the data presented in table 5 it can be stated that the average obtained at the height at the withers of Karakul of Botoşani products belonging to group L2 is higher than that obtained by F1 products, the difference being 1.29 cm in the case of females and 1.74 cm in the case of males, this difference in height at the withers is explained by the fact that the male breeders from the Palas Meat Line used for breeding with the reformed females Karakul of Botoşani have a smaller size than the male breeders from the Karakul of Botoşani breed, this character being transmitted in offspring to F1 products.

Regarding the average obtained at the back height of the analysed products, the average obtained for the F1 products is higher than the one obtained at Karakul of Botoşani lambs from L2 group, the difference being 1.25 cm for females and 0.36 cm for males. This consideration is explained by the

level of the rump in Karakul of Botoşani breed due to the weight of the fat deposit at the base of the tail which makes the back lower than the front.

Also, the values recorded for the thoracic perimeter can state that the products from group L1 have a more developed thorax being descendants of rams for meat production, females having a perimeter with 4.03 cm higher developed and males with 3.29 cm compared with lambs from group L2 Karakul of Botoşani breed.

According to the experimental protocol, the products from the control batches were weighed using the electronic scale, before performing the determinations of the products they were subjected to a fasting period, limiting their access to the food source for a period of 12 hours. Data on the evolution of average body weight and the average daily gain obtained by batch products are presented in table 6.

Table 6 Average body weight 180 days Batches L1 and L2

Age	Weight	L1 F1 Products		L2 Karakul of Botoșani		Difference between the average values	
		Females	Males	Females	Males	Females	Males
180 days	Kg	36.87	38.12	34.97	39.75	1.9	-1.63
Growth rate	g/day	204	211	194	220		

As can be seen in the data presented in table 6, the average weight of females belonging to group L1 with F1 lambs at the age of 180 days was 1.9 kg higher than the average weight of females from group L2 belonging to the breed Karakul of Botoșani. This indicates us that the F1 descendants have higher skills for meat production.

At the age of 180 days, the average weight of males in group F1 was 1.63 kg lower than the average weight of males in group F2 with products from the Karakul of Botoșani breed. This consideration may be due to the fact that the Karakul de Botoșani lambs have a fat deposit at the base of the tail, influencing the weight of the products.

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#### CONCLUSIONS

The average body weight of F1 male lambs, at lambing, in group L1 is 0,5 kg higher than females in the group with a variation index of 0.37 for males and 0.33 for females.

Regarding the body weight of F1 lambs at 30 days, males in the group had a lower average weight of 0.24 kg compared to females in group L1, with a variance index of 0.28 for females respectively 0.24 for males.

Males in the study group had a body weight at the age of 90 days with 0.12 kg higher than females in the analysed group, with a variance index of 0.28 and 0.27 for females in the study group L1.

The height at the withers of the F1 individuals within the group in 2021 is higher compared to that obtained in 2020. The males obtained values by 1.81 cm higher at birth

and the females by 1.82 cm. This difference was maintained throughout the analysed period, reaching 90 days at only 0.29 cm for females and 1.18 cm for males.

Regarding the height of the individuals at the back, there was a difference in the two years analysed, so females obtained at birth a value with 1.10 cm higher in 2021, also males recorded an increase of 0.66 cm. The differences between the two years analysed were maintained for all reference intervals but their value is less significant reaching 90 days at 0.96 cm for females and 0.17 cm for males.

The height at the withers of the Karakul of Botoșani lambs at the age of 180 days belonging to the L2 group is higher than that obtained by the F1 lambs, the difference being 1.29 cm in the case of females and 1.74 cm in males, the difference in height at the withers is explained by the fact that the male breeders from the Palas Meat Line used for breeding with the reformed females Karakul of Botoșani have a smaller size than the male breeders from the Karakul of Botoșani breed, this character being passed down to F1 lambs.

Regarding the back height on the analysed lambs, the average obtained for the lambs resulted from mating specialized rams for meat production with reformed females from Karakul of Botoșani breed is higher than that obtained from Karakul of Botoșani lambs on group L2, the difference being 1.25 cm for females and 0.36 cm for males.

The values recorded for the thoracic perimeter indicate that the lambs in group L1 have a more developed thorax being descendants of rams for meat production, females having a perimeter with 4.03 cm higher and males with 3.29 cm compared with the results obtained on lambs from group L2 represented by Karakul of Botoșani breed.

The average weight at the age of 180 days of females belonging to group L1 with

mixed products was 1.9 kg higher than the average weight of females from group L2 belonging to Karakul of Botoșani breed. The average weight of males in group F1 was 1.63 kg lower than the average weight of males in group F2 with products from the Karakul of Botoșani breed.

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