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THE INFLUENCE OF THE AGE OF SHEEP FOR REPRODUCTION FROM THE GREY KARAKUL BREED (RAMS OF DIFFERENT AGES X 5-YEAR-OLD EWES) ON THE BIRTH WEIGHT AND THE QUALITY OF THE LAMBS SKINS

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Abstract

This study is focused on the impact of parental age (rams of various ages mated with 5-year-old ewes) on the weight and quality of skins in Karakul lambs - Grey variety. The main objective was to analyze the effects of parental age on the weight and quality of lambs skins. Dates used come from the S.C.D.C.O.C. Popăuți records, Botoșani County, Romania, and their analysis was conducted at the USAMV of Bucharest. Research methods included weighting of the lambs immediately after their birth and evaluating the quality characteristics of the curl and other relevant traits in the first two days of their life. The results proved a variety of birth weights ranging from 3.18 to 5.05 kg, as well as a performance classified in the Record and Elite zootechnical class. The study's conclusions highlight that parental age plays a significant role in giving the weight and quality of lamb skins at birth.

Key words*: weight, curl, size, sheen, shade.*

INTRODUCTION

Starting from the initial hypothesis regarding the influence of parental age (rams of different ages mated with 5-year-old ewes) on birth weight and lamb skin quality in Karakul lambs - Grey variety, we undertook this study with the aim of contributing to the understanding the phenomenon in the current scientific context.

In the field of zootechnical research, parental age represents a determining factor that influences reproductive performance and phenotypic qualities of offspring in various animal species, including Karakul sheep. Previous studies have revealed a significant correlation between parental age, birth weight of lambs, and skin characteristics, indicating that lambs born to older parents tend to have a higher birth weight, reflecting a more advanced intrauterine development. Regarding skin quality, observations indicate that lambs born from younger parents usually have a finer and more uniform skin texture, while those ones born from older parents may exhibit certain skin imperfections, such as roughness or/and unevenness. It is essential to emphasize that these trends are likely to be influenced by a wide range of factors, including genetics, environmental conditions, and breeding practices. The research in 2023 highlighted that the birth weight of lambs exhibits a phenotypic correlation directly proportional to the age of the ewes at lambing, body dimensions, skin thickness, fiber length, skin surface area, loop size, and constitution, while the relationship with ewe prolificacy is inversely proportional (Buzu, 2023).

The newborn lamb shows the same phenotypic association between body dimensions and body weight, including skin thickness, fiber length, skin surface area; while constitution is directly proportional to body weight, body dimensions, skin thickness, and skin reserve and inversely proportional to skin density.

Some studies conducted on sheep during the year 2022 highlighted that maternal age had a significant influence only on hair length and skin thickness (Rajabov et al., 2022).

The same author argues that loop development increased with maternal age, while loop score and hair quality deteriorated with advancing maternal age, leading him to support the importance of selection processes in improving the Karakul breed by analyzing the characteristics of lamb skin texture, loop quality, and wool fiber thickness, considered

essential indicators for this breed. Lambs with different loop types exhibited variations and diversity in loop dimensions, including length and width. Observations revealed that lambs with medium-length loops exhibit significant hereditary inheritance, showing respective percentages of 27.6 ± 5.59% for flat type, 34.2 ± 5.64% for semicircular type, and 24.4 ± 6.84% for ribbed type.

Following statistical analysis regarding the matching of breeding pairs based on age, it was found that the most efficient breeding combination for the Karakul sheep breed, black variety, is obtained by crossing 3-year-old rams with 6-year-old females (Maloș et al., 2005).

This mating configuration is characterized by the following technical indicators: average birth weight of 3.25±3.94 kg, loop type with an average of 90.32±3.94 points, loop size with an average of 18.16±1.38 points, fiber quality with an average of 43.16±3.16 points, fiber luster with an average of 58.00±2.02 points, color hue with an average of 88.16±2.94 points, and own performance with an average of 515.16±19.11 points.

Some authors argue that maternal age appears to be the most significant known environmental effect influencing Karakul skin traits. This effect was more pronounced in certain types than in others, complicating the possibility of adjusting for the maternal age effect. In almost all cases, increasing maternal age led to a deterioration of skin traits (Albertyn & Schoeman, 1993).

Therefore, they recommend not keeping ewes for too long in a flock. These should be eliminated after approximately six years of age.

Other researchers have observed that maternal age and lamb sex significantly influence skin thickness, while birth month does not appear to have a significant impact. Conversely, other scholars contend that no significant differences in skin thickness have been identified among various age groups of ewes (Greeff et al., 1991; Van Niekerk, 1972, as cited in Albertyn & Schoeman, 1993).

MATERIALS AND METHODS

The study was conducted between 2022 and 2023 at the University of Agronomic Sciences and Veterinary Medicine of Bucharest, Faculty of Animal Production Engineering and Management, based on data collected from registers completed within the S.C.D.C.O.C. Popauţi unit, regarding the Karakul sheep population of Botoșani, Grey color variety.

The biological material included in the study consisted of 525 sheep, structured as follows: 486 ewes and 39 rams. To ensure the repeatability of the results, the study was conducted under the same conditions over a period of seven years (notated from I to VII), following these steps:

I. All mating pairs were selected based on Grey color and age groups from the mating and lambing register, with rams of different ages paired with 5-year-old ewes, forming the following combinations: 2x5, 3x5, 4x5, 5x5, and 6x5 for the seven years of study.

II. The following determinations were made for the mentioned mating combinations:

Determination of birth weight of offspring – by weighing lambs immediately after birth.

Determination of values (points) for traits related to loop quality – by scoring lambs on the first day after birth, and overall skin traits were evaluated during lamb scoring in the first two days after birth; sex distribution – after lambing, sexes were recorded in registers.

III. The recorded data were statistically processed, calculating: mean, standard deviation, mean error, coefficient of variation, and limits for each trait studied: birth weight, loop type, loop size, fiber quality, fiber luster, color hue, and synthetic index, as well as own performance.

IV. The obtained results were synthesized in tables for a more suggestive interpretation, in comparison with existing bibliographic data.

RESULTS AND DISCUSSIONS

Starting from the initial premise regarding the impact of parental age (rams of different ages mated with 5-year-old ewes) on birth weight and skin quality of Karakul lamb – Grey variety, the following results were obtained:

A. Mating combination between rams of different ages (2, 3, 4, 5, 6, and 7 years) with 5-year-old females - Year I

The offspring resulting from the mating of rams aged 2, 3, 4, 5, and 6 years with 5-year-old

ewes (Table 1 presents the following average values for the mating group: 4.48 kg, birth weight - which exceeds the breed standard; loop with a score of 79.82 points - representing the combined type of good glossy value, mirrors; medium loop size with a score below the breed standard, of 18.70 points; fiber quality moderately silky (36.56 points); satisfactory-good luster (56.81 points); good grey color hue, light grey with a score of 101.04 points and own performance of 503.49 points in the "Record" zootechnical class.

Table 1. Influence of the age of sheep for reproduction - rams of different ages x 5-year-old ewes - on birth weight and skin quality of Karakul Grey lambs - Year I

Age	Specification	Characters						
		Birth weight (kg)	Loop type (points)	Loop size (points)	Fiber quality (points)	Fiber gloss (points)	Color shade (points)	Own performance (points)
2x5	$\bar{x} \pm s_{\bar{x}}$	4.47±0.18	82.00±9.61	18.33±6.67	31.6±10.14	56.67±1,67	110.00±15.27	504.33±59.95
	CV%	6.84	20.30	62.98	55.45	5.09	24.05	24.05
3x5	$\bar{x} \pm s_{\bar{x}}$	5.05±0.54	70.00±5.00	12.50±7.50	40.0±10.00	55.00±.20.00	97.50±22.50	447.50±17.50
	CV%	12.60	10,10	84.85	35.36	12.86	32.64	5.53
4x5	$\bar{x} \pm s_{\bar{x}}$	4.36±0.25	87.40±7.05	20.00±3.87	43.00±7.00	59.00±1.00	95.00±8.06	519.40±37.07
	CV%	13.04	18.05	43.30	36.40	3.79	18.98	15.96
5x5	$\bar{x} \pm s_{\bar{x}}$	4.33±0.28	77.00±8.81	21.2±11.76	35.00±9.57	56.25±9.44	96.25±12.48	514.50±29.10
	CV%	13.13	22.88	1.25	54.71	33.55	25.93	11.31
6x5	$\bar{x} \pm s_{\bar{x}}$	4.20±0.17	82.71±7.53	21.43±.2.83	3.14±4.79	57.14±1.84	106.43±9.80	531.71±25.44
	CV%	10.91	24.09	34.91	38.26	8.54	24.37	12.66
Media		4.48	79.82	18.70	36.56	56.81	101.04	503.49

Upon detailed analysis, the following observations can be made:

- Birth weight shows the highest average value among the mating combinations studied at 5.05 kg, with limits of 4.6-5.05 between kg and a coefficient of variation of 12.60% for the 3x5 year mating combination, and the lowest at 4.20 kg, with limits of 3.4-4.8 kg and a coefficient of variation of 10.91%. As observed, birth weight progressively decreases from 5.05 kg in the 3x5 year mating combination to 4.20 kg in the 6x5 year mating combination.
- Loop size presents the best average value of 21.43 points, ranging from medium-small to medium, with limits of 5- 25 points and a coefficient of variation of 34.91% for the 6x5 year mating combination, and the weakest average value of 12.50 points, ranging from small with limits of 5-20 points and a coefficient of variation of 84.85% for the 3x5 year mating combination.
- Loop type appears as a combined type: good glossy value and waves, good glossy value and ribs, etc., with a score of 87.40 points and limits of 60-98 points for the 4x5 year mating combination, while the 3x5 and 5x5 year mating combinations present a combined loop type: long flat tube, medium-long, with a score of 70 points.

Following the mating of 5-year-old ewes with rams aged 2, 3, 4, 5, and 6 years it can be said that the age factor of the ewes led to the attainment of high average values in the 4x5 year mating combination, characterized by: birth weight of 4.36 kg, with limits of 3.7-5.5 kg, superior to the breed standard; loop characterized by a score of 87.40 points, representing a combined type of medium-short tube, medium knob, with limits of 60-98 points; medium-small to medium loop size with an average of 21.43 points and limits of 5-25 points; fiber quality ranging from normal to silky with a score of 43.00 points, and limits of 15-50 points; good fiber luster with a score of 59.00 points, with limits of 55-60 points; color hue of 95.00 points, with limits of 75-120 points, representing a dark grey hue, light grey

hue, and other tar-black colors, and own performance classifying the offspring in the "Record" zootechnical class, with limits of 385-605 points and an average value of 519.40 points.

The weakest mating combination resulted from this mating was obtained in the 3x5 year cross, characterized by the following average values: birth weight of 5.05 kg, with limits of 4.6-5.5 kg, exceeding the breed standard; loop of very good glossy wave type, mowing; small loop size, medium-large, size not conforming to the breed standard; normal fiber quality, with a score of 40 points, with limits of 30-50 points; satisfactory-good fiber luster with a score of 55 points and limits of 50-60 points (luster is below the breed standard and undesired by sheep for reproduction); color hue is good, dark grey, with a score of 97.50 points and limits of 75-120 points, and according to the limits, we encounter both dark grey hue and pure grey hue; own performance classifies the offspring in the "Elite" zootechnical class, with a score of 447.50 points and limits of 430-465 points.

B. Mating combination between rams of different ages (2, 3, 4, 5, 6, and 7 years) with 5-year-old females - Year II

The offspring resulted from the mating of rams aged 2, 3, 4, and 5 years with 5-year-old ewes (Table 2) were characterized by the following achieved performances:

- Birth weight: 3.53 kg, a value below the breed standard, with the highest average of 3.93 kg achieved in the 6x5 year mating combination, a value within the breed standard, with limits of 3.5-4.3 kg and a coefficient of variation of 10.27%; the lowest being 3.18 kg in the 4x5 year mating combination, with limits of 2.8-3.9 kg and a coefficient of variation of 14.82%, a value approximately 0.62 kg below the breed standard.
- Loop type: it presents an average value per mating group of 77.05 points, representing a loop type of good glossy wave, small-medium knob, with the best loop in the 3x5 year mating combination, scoring 84.00 points, representing a large knob type, intense glossy wave, with limits of 82-86 points and a coefficient of variation of 3.37%. The weakest loop recorded was in the 6x5 year mating combination, with a loop of short tube, small knob type, with limits of 62-72 points; the limit of 62 points indicates a large knob type loop, undesired on the Karakul lamb skin.
- Loop size: 15.46 points, small to medium-small, with the best loop size being 17.50 points, medium-small to small, with limits of 10-25 points and a coefficient of variation of 60.61%; the weakest loop size recorded was 13.33 points, observed in the 2x5 year mating combination, with limits of 10-20 points and a coefficient of variation of 43.30%.

Table 2. Influence of the age of sheep for reproduction - rams of different ages x 5-year-old ewes - on birth weight and skin quality of Karakul Grey lambs - Year II

Age	Specification	Characters						
		Birth weight (kg)	Loop type (points)	Loop size (points)	Birth weight (kg)	Fiber gloss (points)	Color shade (points)	Birth weight (kg)
2x5	$\bar{x} \pm s\bar{x}$	3.47±0.18	80.00±10.41	13.33±3.33	41.67±8.33	45.67±17.95	95.00±35.00	480.67±88.55
	CV%	8.81	22.53	43.30	34.64	68.07	63.81	31.91
3x5	$\bar{x} \pm s\bar{x}$	3.55±0.75	84.00±2.00	17.50±7.50	40.00±10.00	55.00±5.00	92.50±2.50	506.50±14.50
	CV%	29.88	3.37	60.61	35.36	12.86	3.82	4.05
4x5	$\bar{x} \pm s\bar{x}$	3.18±0.21	76.20±4.95	16.00±3.67	42.00±4.90	59.00±4.58	101.00±12.88	486.80±39.04
	CV%	14.82	14.54	51.35	26.08	17.37	28.52	17.93
6x5	$\bar{x} \pm s\bar{x}$	3.93±0,23	68.00±3,05	15.00±3.05	31.67±10.14	56.67±3.33	88.33±21.28	439.00±27.22
	CV%	10.27	7.78	33.33	55.45	10.19	41.72	10.74

- Fiber quality: Normal-silky, scoring 38.83 points, with the best quality at 42 points observed in the 4x5 year mating combination. All mating combinations scored below 45 points.
- Fiber sheen is a trait sought after by sheep for reproduction due to its economic value to the peltry. The average value across mating combinations is 54.08 points, representing good sheen, with the best sheen observed in the 4x5 year mating combination, scoring 59.00 points, satisfactory-good to good, with limits of 50-75 points and a coefficient of variation of 17.37%. The weakest sheen recorded was 45.67 points, weak-satisfactory to satisfactory, with limits of 10-67 points and a coefficient of variation of 68.07%.
- Color shade: Across mating combinations, it scores an average of 94.21 points, with the highest average of 101.00 points for pure-light grey, pure grey, and the lowest average of 88.33 points for dark grey, with limits of 60-130 points, representing a shade of light grey (60 points) and pure grey (130 points).
- Own performance: "Elite" with the best performance recorded in the 3x5 year mating combination, scoring 506.50 points, with limits of 492-521 points, and a coefficient of variation of 4.05%, while the weakest performance of 439.00 points, "Elite" class, was recorded in the 6x5 year mating combination, with limits of 397-490 points, and a coefficient of variation of 10.74%.
- The best mating combination in this group is between 3-year-old rams and 5-year-old ewes, with a birth weight averaging 3.55 kg; loop score of 84.00 points; loop size medium-small to small with a score of 17.50 points; fiber quality 40 points, normal-silky; fiber sheen satisfactory-good, scoring 55.00; color shade 92.50 points, and "Record" own performance with a score of 506.50 points.
- The weakest mating combination is between 6-year-old rams and 5-year-old ewes, characterized by a birth weight of 3.93 kg, standard for the breed; loop type scored at 68.00 points; loop size small to medium-small, scoring 15 points; fiber quality normal, scoring 31.67 points; fiber sheen satisfactory-good, scoring 56.67 points; color shade scoring 88.33 points, and own performance of 439.00 points, "Elite" class with limits of 397-490 points. Consequently, this combination exhibits individuals with very poor fur quality.

If we make a difference based on fiber quality in the loop, we can say that the best mating combination is between 4-year-old rams and 5-year-old ewes, which means a pure silky fiber with satisfactory-good to good sheen and a very good color shade.

C. Mating combination between Rams of Different Ages (2, 3, 4, 5, 6, and 7 years) with 5-Year-Old Ewes – Year III

The offspring resulted from mating rams aged 2, 3, 4, and 5 years with 5-year-old ewes (Table 3) are characterized by the followings:

- Average birth weight: 3.56 kg, a value below the birth standard, with the highest average recorded in the 3x5 year mating combination, at 3.84 kg, a value within the breed standard, with limits of 2.6-5 kg and a coefficient of variation of 21.87%. The lowest recorded weight was 3.30 kg in the 5x5 year mating combination, with limits of 2.6-4 kg and a coefficient of variation of 30%, a value below the breed standard by approximately 0.24 kg.
- Curl: It relates an average value across mating combinations of 75.75 points, representting a good glossy curl, ribs, or mirrors, with the best curl at 91.00 points, a large bob type, good glossy curl, with limits of 86-96 points and a coefficient of variation of 7.77%. The weakest curl was recorded in the 5x5 year mating combination, with a curl type of glossy-less, ribs, feathers, or only feathers, with limits of 40-71 points. The limit of 40 points indicates a poor curly type, undesirable on Karakul lambskin.
- Curl size across mating combinations is 18.75 points, small to medium-small, with the best curl size at 22.50 points, medium-small to medium, with limits of 20-25 points and a coefficient of variation of 15.71%. The weakest curl size was 15.00 points recorded in the 5x5 year mating combination, with limits of 10-20 points and a coefficient of variation of 30%.
- Fiber quality: It is normal-silky, scoring 38.30 points, with the best quality at 40 points in the 2x5 and 4x5 year mating combinations.
- Fiber luster is a trait closely observed by sheep for reproduction due to its contribution to the economic value of the lambskin. The average value per mating group

is 59.02 points, indicating good luster, with the highest luster recorded in the 4x5-year mating variant, scoring 67.5 points, indicating very good to intense luster, with a range of 60-75 points and a coefficient of variation of 15.71%. Conversely, the lowest luster recorded is 52.50 points, ranging from satisfactory to satisfactory-good, with a range of 30-75 points and a coefficient of variation of 60.61%.

Table 3. Influence of the age of sheep for reproduction - rams of different ages x 5-year-old ewes - on birth weight and skin quality of Karakul Grey lambs - Year III

Age	Specification	Characters						
		Birth weight (kg)	Loop type (points)	Loop size (points)	Birth weight (kg)	Fiber gloss (points)	Color shade (point)	Birth weight (kg)
2x5	$\bar{x}_{\pm s}\bar{x}$	3.65±0.15	78.50±1.50	17.50±7.50	40.00±10.00	57.50±2.50	110.00±20.00	525.50±44.50
	CV%	5.81	2.70	60.61	35.36	4.35	25.71	11.98
3x5	$\bar{x}_{\pm s}\bar{x}$	3.84±0.34	78.00±4.82	20.00±2.89	35.71±3.98	58.57±1.54	102.14±7.44	527.29±22.50
	CV%	21.87	15,15	35.36	27.33	6,45	17,.4	10.45
4x5	$\bar{x}_{\pm s}\bar{x}$	3.45±0.55	91.00±5.00	22.50±2.50	40.00±10.00	67.50±7.50	110.00±20.00	540.00±16.00
	CV%	22.55	7.77	15.71	35.36	15.71	25.71	4.19
5x5	$\bar{x}_{\pm s}\bar{x}$	3.30±0.70	55.50±15.50	15.00±5.00	37.50±12.50	52.5±22.50	77.50±52.50	413.5±112.50
	CV%	30.00	39.50	47.14	47.14	60.61	95.80	38.48

Color shade exhibits an average score per mating group of 99.91 points, with the highest average of 110.00 points observed in the 2x5 and 4x5-year mating variants, representing pure-light grey, pure grey, and the lowest average of 77.50 points, representing dark grey, with ranges from 75-130 points, including a matte and pure grey (130 points).

The average individual performance is classified as "Record," with the highest performance recorded in the 4x5-year mating variant, scoring 540.00 points, ranging from 524-556 points, and a coefficient of variation of 4.19%, while the lowest performance of 413.50 points, classified as "Elite," was recorded in the 5x5-year mating variant, ranging from 301–526 points, with a coefficient of variation of 38.48%.

- The best mating variant in this group is between 4-year-old rams and 5-year-old ewes. Despite having a lower birth weight, this mating exhibits maximum scores in other traits. The average birth weight per mating is 3.45 kg; curl type 91.00 points; curl size medium-small to medium with a score of 22.50 points; fiber quality 40 points, normal-silky; fiber luster very good-intense, scoring 67.5 points; color shade 110.00 points; and individual performance rated as "Record," scoring 540 points.

The weakest mating variant is between 5-year-old rams and 5-year-old ewes. This mating is characterized by a birth weight of 3.30 kg, below the breed standard; curl type scored at 55.50 points; curl size small to medium-large, with a score of 15 points; fiber quality rough-silky, scoring 37.5 points; fiber luster satisfactory to satisfactory-good, scoring 52.5 points; color shade weak, scoring 77.50 points, yet exhibiting a wide range from 25 points (dull) to 130 points (pure grey); and individual performance of 413.50 points, classified as "Elite," ranging from 301-526 points. Consequently, this variant comprises individuals with very poor lambskin quality.

D. The mating variant between rams of different ages (2, 3, 4, 5, 6, and 7 years) with 5-year-old ewes - Year IV

The offspring resulted from mating 4-year-old rams with 5-year-old ewes (Table 4) presented the following average values: birth weight - 3.77 kg, curl type - 75.71 points, curl size - medium to large, with a score of 14.29 points, fiber quality - normal-silky 43.57 points, fiber sheen - good 59.29 points, color hue - 82.86 points, and own performance - 459.57 points, represent the "Record" zootechnical class.

Table 4. Influence of the age of sheep for reproduction - rams of different ages x 5-year-old ewes - on birth weight and skin quality of Karakul Grey lambs - Year IV

Age	Specification	Characters						
		Birth weight (kg)	Loop type (points)	Loop size (points)	Birth weight (kg)	Fiber gloss (points)	Color shade (points)	Birth weight (kg)
4x5	$\bar{x}_{\pm s}\bar{x}$	3.77±0.27	75.71±1.81	14.29±3.35	43.57±7.83	59.29±3.17	82.86±11.94	459.57±22.85
	CV%	18.73	6.32	62.05	25.41	14.14	38.14	13.16
Media		3.77	75.71	14.29	43.57	59.29	82.86	459.57

E. The mating option between rams of different ages (2, 3, 4, 5, 6, and 7 years) and 5-year-old ewes - year V

The offspring resulting from mating rams of different ages (2, 3, 4, 5, 6, and 7 years) with 5-year-old ewes (Table 5) present the following average values for the traits studied:

- Birth weight has an average value of 4.18 kg, within the breed standard, with a maximum average of 4.20 kg in the mating variant 2x5 years, with limits of 4-4.6 kg and a coefficient of variation of 8.25%, and a lower average of 4.15 kg in the mating variant 5x5 years, with limits of 3.7-4.5 kg, and a coefficient of variation of 8.91%.
- Curl type appears as a medium-length tube, short, with medium-sized bobbing, scoring 97.29 points per mating group, with the best curl, good glossy type, scoring 100.33 points, in the mating variant 2x5 years, with limits of 88-115 points, and a coefficient of variation of 13.61%, and the weakest at 94.25 points, a medium tube curl, medium bob, with limits of 70-115 points, and a coefficient of variation of 19.69%.
- Curl size in the mating group is medium-small, scoring 20.21 points, with the best at 21.67 points, medium-small to medium size in the mating variant 2x5 years, and the lowest at 18.75 points in the mating variant 5x5 points, with a coefficient of variation of 33.55%.

Table 5. Influence of the age of the sheep for reproduction - rams of different ages x 5-year-old ewes - on birth weight and the quality of Karakul lambs' fleece - Year V

Age	Specification	Characters						
		Birth weight (kg)	Loop type (points)	Loop size (points)	Birth weight (kg)	Fiber gloss (points)	Color shade (points)	Birth weight (kg)
2x5	$\bar{x}_{\pm s}\bar{x}$	4.20±0.20	100.3±7.88	21.67±1.67	43.33±6.67	58.33±1.67	96.67±3.33	550.33±26.43
	CV%	8.25	13.61	13.32	26.65	4.95	5.97	8.32
5x5	$\bar{x}_{\pm s}\bar{x}$	4.15±0.18	94.25±9.28	18.75±3.15	40.00±5.77	57.50±2.50	96.25±12.48	506.75±33.00
	CV%	8.91	19.69	33.55	28.87	8.70	25.93	13.19
Media		4.18	97.29	20.21	41.67	57.92	96.46	528.54

- Fiber quality is normal-silky with a score of 41.67 points, with the best quality at 43.33 points in the mating variant 5x5 years, with limits of 30-50 points, and the weakest quality recorded in the mating variant 5x5 years, with limits of 30-50 points, and a coefficient of variation of 28.87%.
- Fiber sheen in the mating group is satisfactory-good to good, scoring 57.92 points, with the highest average of 58.33 points, satisfactory-good to good, with limits of 55-60 points and a coefficient of variation of 4.95%, and the lowest average of 57.50 points, satisfactory-good to good, with limits of 50-60 points and a coefficient of variation of 8.70%.
- Color shade presents a good average of 96.46 points, with the highest average on color shade being 96.67 points, with limits of 90-100 points and a coefficient of variability of 5.97%. The lowest is 96.25 points, with limits of 75-130 points and a coefficient of variability of 25.93% at the breeding option of 5x5 years.

Own performance of 528.54 points, that represents the "Record" zootechnical class in

the breeding group, with the best performance of 550.333 points at the breeding option of 2x5 years, with limits of 498-583 points and a coefficient of variability of 8.32%. The lowest is 506.75 points, with limits of 444-575 points and a coefficient of variability of 13.19%.

- Out of the two breeding options available in this group, the highest average values were recorded in the breeding option of 2x5 years, while the weakest results were observed in the breeding option of 5x5 years, with both breeding options characterized by relatively close average values between them.

F. Breeding option between rams of different ages (2, 3, 4, 5, 6, and 7 years) with 5-year-old females - Year VI

The average values recorded in the breeding group between rams aged 2 and 3 years (Table 6) place the offspring in the "Record" zootechnical class, mainly due to the following performances: birth weight of 4.17 kg, very good coil with long, medium, short type, medium-small to medium size, normal-silky fiber quality with very good-intense shine, and a color shade rated at 88.33 points.

Table 6. Influence of the age of the sheep for reproduction - rams of different ages x 5-year-old ewes - on birth weight and the quality of Karakul lambs' fleece - Year VI

Age	Specification	Characters						
		Birth weight (kg)	Loop type (points)	Loop size (points	Birth weight (kg)	Fiber gloss (points)	Color shade (points)	Birth weight (kg)
2x5	$\bar{x} \pm s \bar{x}$	4.25±0.25	97.50±4.50	22.50±2.50	40.0±10.00	57.50±2.50	85,.0±5.0	455.0±102.99
	CV%	8.32	6.53	15.71	35.36	6.15	8.32	11.10
3x5	$\bar{x} \pm s \bar{x}$	4.50±0.50	105,. ±7.00	22.50±2.5	48.50±1.50	67.50±7.50	80.00±10.00	550.00±53.00
	CV%	15.71	9.43	15.71	4.37	15.71	17.68	13.62
6x5	$\bar{x} \pm \bar{x}$	3.75±0.05	93.50±2.50	22.50±2.5	37.5±12.50	67.50±7.50	100±10.00	555.50±15.50
	CV%	1.89	3.78	15.71	47.14	15.71	14.14	3.95
Media		4.17	98.67	22.50	42.00	64.17	88.33	520.17

Comparing the average values between the three mating variants of 2x5, 3x5, and 6x5 years, it can be observed that the best mating is between 3-year-old rams and 5-year-old ewes. The resulted offspring exhibit the following performances on the studied traits: a birth weight of 4.50 kg, exceeding the breed standard; a combined type of curl, with long, medium, and short loops and a medium-small to medium size; normal-silky fiber quality with a very good-intense shine and a color shade noted at 80.00 points. The own performance is "Record", with a score of 550.00 points.

The weakest mating variant regarding the studied traits 6x5 years differs from the one presented earlier by lower average values for the curl type and fiber quality, namely 93.50 and 42.00 points, respectively, and by other traits that are superior, however, by very small differences, which explains the good average values on the mating group.

G. Mating between rams of different ages (2 and 3 years) with 5-year-old ewes - year VII

The mating group between 5-year-old ewes and 2- and 3-year-old rams is characterized by the best mating variant between 2-year-old rams and 5-year-old ewes (Table 7), which produced offspring with a very good birth weight of 4.60 kg.

They exhibit a curl type characterized by a good shiny loop, medium-sized, with fiber of

normal quality, very good-intense shine, and a color shade with a score of 118.33 points. The own performance, based on the score presented, falls within the "Record" zootechnical class.

The weakest mating variant is the one achieved between 5-year-old females and 3-year-old males, characterized by the following performances: birth weight of 4.00 kg, curls presented in the form of short curls, small bobs, with a good shiny appearance, medium-small curl size, soft-coarse texture, fiber shine ranging from weak to satisfactory, and a dark brumal color shade. The own performance is classified as "Elite" with a score of 434.5 points.

Table 7. Influence of the age of the sheep for reproduction - rams of different ages x 5-year-old ewes - on birth weight and the quality of Karakul lambs' fleece - Year VII

Age	Specification	Characters						
		Birth weight (kg)	Loop type (ponts)	Loop size (points)	Birth weight (kg)	Fiber gloss (points)	Color shade (points)	Birth weight (kg)
2x5	$\bar{x}_{\pm s}\bar{x}$	4.60±0.21	93.33±5.93	23.33±1.67	31.37±10.14	65.00±5.00	118.33±11.67	528.33±46.90
	CV%	7.84	11.00	13.37	55.45	13.32	17.08	15.38
3x5	$\bar{x}_{\pm s}\bar{x}$	4.00±1.40	87.0±15.00	15.00±5.00	20.00±5.00	45.0±15.00	77.50±52.50	434.5±37.50
	CV%	49.50	24.38	47.14	35.35	47.14	95.80	12.20
Media		4.30	90.17	19.17	25.83	55.00	97.91	481.42

CONCLUSIONS

From the analysis of the evolution of birth body weight over the 7 years of study, it is observed that the best combinations were achieved between 5-year-old females and 2-year-old males, except for the first year of study where performances were obtained in all combinations (2x5; 3x5; 4x5; 5x5; and 6x5).

For the assurance of obtaining superior quality, marketable pelts in the process of matching partners in the "major" production, besides other criteria (color, direction of curling of the curl, etc.), the age criterion of the partners must also be taken into account, so that at least one of the partners is an adult: 3, 4, 5, 6 years old (the other partner can be young - 2 years old or old - 7 years old and older).

For the breeding stocks, it is recommended to carry out selection for pelt quality, as much as possible, from the offspring obtained from mating 5-year-old ewes with 6, 2, and 3-year-old rams in Karakul brumăriu.

Analyzing the evolution of own performances, it can be observed that all lambs obtained from mating 5-year-old ewes with rams of different ages of 2, 3, and 4 years are classified into the zootechnical class called Record, while the lambs obtained from mating 5-year-old females with males of 5 and respectively 6 years are classified into the lower zootechnical class compared to the previous Elite.

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According to the studies conducted by researchers, it seems that the age of the mother is one of the environmental factors with the greatest influence on the characteristics of Karakul lamb pelts. In most cases, increasing maternal age has been associated with a degradation of pelt traits, a conclusion that is also confirmed by the results of this study. Therefore, it is strongly recommended to limit the period of time during which ewes are kept in the flock to approximately six years and even younger ages. This approach is essential to minimize the negative effects on lamb pelt quality and to ensure optimal flock management.

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