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Comparison of Growth and Development Characteristics of Lambs Obtained From Early Pregnancy and Lambs obtained From Spring Pregnancy

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Abstract

Therefore, the aim of increasing sheep breeding products is to clarify the forms of influence on the genotype and to analyze it.In modern times, the most important among the measures for the development of sheep breeding and raising its productivity is the application of early fetuses in farms and the selection of inbred types based on their productivity. Creation of highly productive groups and types of sheep suitable for local conditions, their further development, improvement of productivity quality, maintenance based on modern technology and other problems are the main tasks ahead. Experiments conducted on the Bozakh breed, which is one of the most widespread sheep breeds in the western region of the Republic of Azerbaijan, covered the years 2019 - 2023. Bozakh breed belongs to meat-wool breeds created as a result of public selection. The study was conducted in order to study the effect of the time of obtaining a fetus on its fertility within a breed. The time of obtaining the fetus was different. In sheep farming, the influence of gestation period and milk yield of mother sheep on the productivity indicators of the lambs and the quality of the product was compared with studies, the obtained results were summarized and an efficient technology was developed.

Keywords: Bozakh sheep, wool, meat, fetus, live weight, of folk selection, lambs.

Introduction

The field of sheep breeding is of great importance both in the national economy and in agriculture. Among agricultural animals, the field of sheep farming is always ahead due to its unique products. [1, 3, 17]. This is due to the fact that the food and non-food products of the sheep farming area differ from those of other types of animals due to their quality indicators. [7, 9]. Therefore, the aim of increasing sheep breeding products is to clarify the forms of influence on the genotype and to analyze it [11, 13].

As it is known, Bozakh sheep were created on the basis of folk selection. Bozakh sheep are big-necked. The wool contains 68.3% mohair, 18.7% transition, 8.0% wool and 5.0% dead hair.On average, 110-115 lambs are purchased from every 100 ewes in the farm. Bozakh sheep are resistant to heat, less prone to prioplasmosis.The color of sheep is white and yellowish.The disadvantage of these sheep is that they are relatively small and less productive. [2, 7, 8, 11].

In the territory of the Republic, the death of lambs usually occurs in May-June when traveling to the plateau, or when the plateau is newly reached. The reason for this is that weak and 10-13 kg baby lambs taken from February-March lambs travel long distances and fall suddenly into the cold mountain climate and fall ill with pneumonia. However, as a result of our research, none of the lambs obtained from early fetuses died in the meadow.

In our research, the goal was to conduct a comparative analysis of the growth and development

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characteristics of lambs obtained from late-term fetuses and lambs obtained from spring fetuses.

Materıals and Methods

For this purpose, 1 month before mating, 200 head of semi-coarse wool 2.5-year-old typical Bozakh sheep are selected, mother sheep meeting the requirements of class I are divided into 2 groups of 100 heads each, experimental and control group. Accordingly, 5 breeding rams whose ancestry is known were selected and used during mating. The rams are of the pure Bozakh breed and are not closely related to the ewes.

Sheep allocated for research work were studied in 2 variants (I group research and II group control). In the first option, the influence of the time of the fetus transfer on the productivity indicators of the lambs was studied in both groups. Mother sheep of group I were mated in July (winter fetus), and mothers of group II were mated in September-October. First, the live weight of the ewes selected for the experiment (in both groups) was studied by weighing them individually (0.5 kg accuracy) at the beginning of the experiment and by seasons. Mating was done manually. That is, the mating of ewes was done on the mating table. Each ram was paired with 10 ewes (with fixed breeder rams) in both groups at the indicated times.

Traits:

- Fertility and productivity indicators of ewes were studied comparatively in both groups (Table 1).

- Puppies from both studied groups were individually recorded, marked (by sex group) and numbered, their live weight was recorded individual weighing in the following months (absolute weight gain and daily weight gain are determined). Also, special control and zootechnical requirements are fulfilled.

- The live mass of mothers and the live mass of their offspring at birth are studied in comparison. (Table 3).

- By weighing puppies at 1, 3, 6, 9, 12, 15, 18 months, body measurements are taken and compared, and the main parameters of growth and development dynamics are analyzed biometrically in the tables. (Table 2).

Here, X is the average numerical quantity, m is the error of the average numerical quantity, σ is the mean square deviation, CV is the coefficient of variation. These biometric numbers are found using the following formulas.

$X= \sum Vn$, $\sigma = \sum (v-x)2n-1$ or $\sigma= an-1$ $m= n$, $C_v=\sigma \cdot 100x$

Results of the study and their dıscussıon

At the same time, it is clear that the rate of growth per month is superior in both gender groups. A comparative analysis of winter and spring fetuses was performed in experimental groups (Table 1).

As can be seen from the table, the lambs born in December-January are significantly different in terms of live weight characteristics, both at birth and at later ages, compared to those born in February-March. Thus, the live weight of 6-month-old lambs fed from early fetuses was 30.9 kg, which was 17.8 kg more than the spring lambs. The live weight of two-year-old big ewes was 52.5 kg, while the live weight of ewes born in spring was 42.9 kg. Based on the results of our research, it is clear that the growth, development dynamics and productivity indicators of the group of animals created as a result of the fall fetus were superior to those of the spring fetus.

The interesting thing is that when the sheep leave for the pasture at the end of April, the lambs have grown to 28.7-31.8 kg, and the lambs from February-March lambs are still small, i.e. 11.9-13.2 kg. Such lambs are left behind on the mountain roads, they trouble the shepherds, and they quickly catch cold and perish from even a slight change in the weather on the way.

The following table shows that the live weight of the lambs born in November-December is higher than the lambs born in February-March, both at birth and during the later development period. This increase is 4.4-5.6 kg (11.5%-13.4%) in two-year-old sheep. Also, the wool shearing of sheep obtained from early embryos is 14-18% higher than sheep obtained from spring embryos. The comparison of the growth dynamics of the animals obtained from weaned fetuses and those of spring fetuses is given in the following table.

The correlative relationship between mothers and their lambs that gave birth in different periods was studied and a special table was drawn up. It is clear that depending on the season of the year, the live weight of the mothers is different, and the weight of the cubs taken from them is also different.

From the analysis of the table, it is clear that if the live weight of the mothers was 48.5 kg on average in December, the live weight of the puppies obtained from her reached 3.3 kg on average. During the period between December and January of that year, the live mass of mothers decreased. First of all, this is due to the fact that as the winter period progresses, the live mass inevitably decreases in herds with a low level of feeding. Here in January,

the live weight of the mothers was 42.3 kg, and the live weight of the cubs decreased to 2.95 kg. During the most recent monitoring period, the live weight of the mothers decreased to 38.6 kg in March, and the live weight of the pups during the same period was 2.75 kg. From this analysis, it is clear that as the time in the winter period increases, the live mass reached by the mothers gradually decreases compared to the autumn period, and accordingly the live mass of the cubs also decreases.

As can be seen from the table, the average live weight of sheep at birth in December was 48.5 kg, and in January it was 42.6 kg, i.e. a difference of 5.3 kg, in some cases even 9 kg. The reason is that the Bosphorus sheep starve during the winter. Therefore, both the sheep lose weight and the embryo does not get enough nutrition in the womb. On the contrary, since the sheep that have strayed from the meadow in autumn are fat and healthy and the issue of feed has not yet taken a serious shape, the animal can feed itself in the pasture and does not lose weight. For this reason, the lambs can be fed enough, and their live weight is higher when they are born. Thus, lambs born in December are heavier than lambs born in March by 700 grams on average. [5, 11]. This situation is also observed in 1-month-old and 3-month-old lambs: the live weight of one-month-old and three-month-old early lambs is higher than that of March lambs.

During the research, in particular, the wool productivity of earlyand spring foals at 12 months of age was comparatively analyzed.

The goal was to find out in what period the productivity of wool and its main quality indicators are superior, therefore, the wool productivity of lambs purchased in different seasons and the percentage of mohair, wool and transition hairs, which are its quality indicators, were studied. [8, 10, 15]. As it is known, the presence of mohair fiber in wool fibers increases the thinness, brightness and softness of wool, and the area of its use also increases. [11, 12, 14].

It is known from the research conducted by scientists of the world that the quality indicators of the wool are naturally affected by gender, sex and the level of feeding. Therefore, studying the quality of wool in the Bozakh breed by sex and periods is provided in the methodology. For this purpose, wool productivity and quality indicators of wool in experimental group animals in different seasons and groups were studied (Table 4).

From the analysis of the table below, it is clear that the wool composition and fringe length indicators were different depending on the time of the fetus and the sex. So, if the length of the fringe was 13.5 cm in the early fetus, the length of the fringe was 14.5 cm and the length of the mohair was 7.3 cm.

However, in spring, the length of the total fringe was 11.0 cm in males, while the bow was 12.0 and the mohair was proportionally 5.0 cm. [4, 5, 6, 7]. Naturally, this primarily depends on the low live mass of spring lambs and the ability to develop wool during the corresponding period. If the total length of the fringe was proportionally 13.7 cm in the female offspring of the early fetus, this indicator decreased to 10.8 cm in the spring fetus, as in the male group. [1,3].

A change was also felt in the fibers of the fringe, so that the length of the fringe was 9.5 cm, while the mohair length was equal to 7.0 cm.

From the analysis of these indicators, it is clear that, first of all, the length of the wool fringe was different depending on the period and gender. [11]. The reason for this is that each individual has a higher live mass during the spring fetus than in the spring fetus. [5, 6, 15].

Since the research work was carried out on the basis of methodology, we studied the body measurements in order to study the growth of the lambs along the line. Lambs were measured at birth and continued for an 18-month cycle. It became clear that the height of the December lambs, chest girth, body width, wrist girth and other dimensions are more than the March lambs, their bones are developed, muscles, heart, lungs, brain, skin and other organs are heavier than the same organs of the March lambs. The reason for this is that early lambs can be fed enough in the mother's womb, while March lambs, on the contrary, suffer from hunger.

Taking into account the above mentioned, as mentioned, the high growth ability of lambs obtained from early embryos results in an additional live mass increase in them, which affects productivity. [15, 16].

One of the most progressive methods in the development of Azerbaijani sheep breeding is the widespread use of early fetuses in sheep breeding. In order to widely apply early fetus, there should be a joint work activity of specialists and farm managers. For this purpose, the scientific work we conducted in the peasant farm of Tovuz region is very interesting and of great importance. [3, 6] The conclusion of the study is shown in the table below.

Analyzing this table, it is known that the carcass weight and slaughter parameters obtained from the 9-month-old bulls have different live weight. For example, the carcass weight of male calves obtained from winter fetuses was 15.75 kg, while this indicator reached 10.56 kg in spring fetuses.

Correspondingly, the cutting indicators were superior in the winter fetus. At the age of 12 months, the carcass weight of males obtained from winter fetuses was 17.10 kg, while that of spring fetuses was equal to 11.59 kg. It is clear from this that if there was a difference of 5 kg between groups in carcass weight at 9 months, this indicator was more than 6 kg at 12 months. This increase was superior in the winter fetus at 15 months of age.

In accordance with the methodology, we have analyzed the chemical composition of the carcass taken from the slaughter in each age group, as well as in the 15-month period, and shown it in the form of a table. The chemical indicator of meat is the main indicator of meat, and its nutritional value (quality) is closely related to its chemical composition. According to the research of many scientists, 17% of mutton consists of fat and 20% of protein. Fat located between and within the muscle is considered quality meat (marbled). The results of our research are given in the following table (Table 6).

The analysis of the table shows that the chemical composition of the meat of male calves obtained from fetuses at different times is significantly different. So, while the dry matter was 37.5% in male foals obtained from winter foals, this indicator was 34.62% in early spring foals and 32.42% in spring foals. A similar preference difference is evident in the amount of protein and fat in the carcass. While the caloric content of 1 kg of meat of male calves obtained from winter fetuses was 2310.36 kcal, this indicator was 2093.86 kkal in 1 kg of meat of puppies obtained from early spring fetuses, and 1958.93 kcal of spring fetuses, respectively. Or, the caloric content of 1 kg of meat of puppies obtained from winter foals was 14.6% higher in early spring foals and 17.9% higher than spring foals.

In connection with the transition to the market economy, the production of meat and milk in cattle breeding is highly effective when, first of all, in agrocomplexes, all issues in the breeding of herds are approached with comprehensive control. During the study, an economic evaluation was conducted on the results of 18-month-old fetuses obtained in different stages (Table 6.).

If we analyze the table, it can be seen that lambs bought from early lambs have more live weight than lambs bought from spring lambs, so 43,4 manats additional income was obtained during the sale. In connection with the transition to the market economy, the production of meat and milk in cattle breeding is highly effective when, first of all, in agrocomplexes, all issues in the breeding of herds are approached with comprehensive control. During the study, an economic evaluation was conducted on the results of 18-month-old fetuses obtained in different stages (Table 7).

If we analyze the table, it can be seen that lambs bought from early lambs have more live weight than lambs bought from spring lambs, so 24.40 manats additional income was obtained during the sale.

Conclusions

Analyzing the results of the study, the following conclusions can be reached:

1. In order to increase the meat yield, it is clear from the results of the lambs carried out in different periods that the live weight of the 4-month-old lambs fed from the early lamb was 30.9 kg, which means 1.78 kg more than the spring lambs. At the age of two years, the live weight of big ewes reached 52.5 kg, while the live weight of ewes born in spring was 42.9 kg. Once again, according to the conclusion of our research, it is clear that the growth, developmental dynamics and productivity indicators of the group of animals created as a result of fall fetuses are superior to spring fetuses and have high reliability ($P>0.001$).

2. Due to births at different times, there was also a difference in the live mass of the mothers. As mentioned, the average live weight of sheep at birth in December was 48.5 kg, and in January it was 42.6 kg, that is, a difference of 5.3 kg, in some cases even 9 kg. The reason is that Bosphorus sheep starve in winter. Therefore, both the sheep lose weight and the embryo does not get enough nutrition in the womb. On the contrary, since the sheep that have strayed from the meadow during autumn are fat and healthy and the issue of feed has not yet taken a serious shape, the animal can feed itself in the pasture and does not lose weight. For this reason, the lambs can be fed enough and their live weight increases when they are born. It is the efficiency of this fetus from the point of view of economy and zooveterinary that can be used.

3. During the study, births in different seasons and months also affected the wool productivity of animals. Thus, wool composition and fringe length indicators were different depending on the winter fetus and gender. That is, if the length of the fringe in males was 13.5 cm in the fertile fetus, but in the spring period, the total length of the fringe in males was 11.0 cm. In female offspring, these indicators were proportionally superior in early fetuses.

Suggestions

According to the research conducted, it is recommended that the fertilization process be carried out in local farms in early spring months, as lambs obtained from spring lambing grow and develop

faster. Especially, lambs obtained in December-January do not perish on the way to the pasture.

Conflicts of interest

There are no conflicts to declare.

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TABLE 1. Comparative analysis of winter and spring fetus

Gender	Time and date of birth of lambs	The sex of the lambs	Live weight at birth, kg	Live mass at the end of May, kg	Live weight in early fetus - 2 years old, kg	Wool shearing, kg
Bozakh	Early fetus (those born in XII-I months)	Male				
	X±m		3,45±0,33	30,9±0,96	52,5±1,44	0,75±0,08
	σ		5,56	2,13	3,22	0,17
	C_v		11,30	7,05	6,15	22,20
		Female				
	X±m		3,20±0,20	28,3±0,75	45,2±0,85	
	σ		4,55	3,15	2,11	
	C_v		13,82	11,13	4,67	
	Winter spring fetus (those born in II-III months)	Male				
	X±m		3,10±0,11	13,1±0,47	42,9±0,89	0,55±0,06
	σ		0,27	1,05	1,99	0,13
	C_v		8,70	7,93	4,72	13,10
		Female				
	X±m		2,90±0,06	12,6±0,39	40,6±0,95	-
	σ		0,14	0,88	2,32	
	C_v		4,72	7,01	5,72	

TABLE 2. Growth dynamics of juveniles in early and spring fetus

Age	Gender	Winter fetus			Spring fetus		
		Live weight, kg	Absolute weight gain, kg	Daily weight gain, gr.	Live weight, kg	Absolute weight gain, kg	Daily weight gain, gr.
At birth	Male	3,4±0,02	-	-	3,1±0,2	-	-
	Female	3,2±0,02	-	-	2,9±0,02	-	-
1 Month	Male	8,1±0,25	4.7	150	7,0±0,19	3,9	130
	Female	7,6±0,21	4.4	140	6,7±0,19	3,6	120
3 Months	Male	18,7±0,38	10.6	170	16,2±0,32	9.2	150
	Female	17,2±0,36	9.6	160	15,1±0,31	8.4	140
6 Months	Male	28,0±0,44	9.3	100	25,4±0,42	9.2	100
	Female	25,8±0,41	8.6	90	23,6±0,40	8.5	90
9 Months	Male	32,6±0,53	4.6	50	29,6±0,51	4.2	40
	Female	30,0±0,54	4.2	40	27,6±0,49	4.0	40
12 Months	Male	36,1±0,57	3,5	30	32,2±0,53	2.6	20
	Female	33,0±0,51	3,0	30	30,1±0,50	2.5	20
15 Months	Male	40,6±0,97	4,5	50	35,9±0,93	3.7	31
	Female	36,6±0,95	3,6	40	32,7±0,91	2.6	20
18 Months	Male	45,5±2,30	4,9	50	38,3±2,15	2.4	20
	Female	41,0±2,25	4.4	40	34,5±2,10	1.8	20

TABLE 3.The relationship between the weight of the mother and the weight of the cub in different periods

Periods	Live mass of mather, kg	Live mass of lambs, kg
	XII-month	
X±m	48,5±1,23	3,3±0,26
σ	2,74	0,57
C_v	5,65	16,9
	I-month	
X±m	42,3±0,77	2,95±0,17
σ	1,73	0,39
C_v	4,08	13,27
	III-month	
X±m	38,6±1,66	2,75±0,13
σ	1,56	0,32
C_v	4,04	11,63

TABLE 4.Quality indicators of wool by groups (n=5)

Gender	Practice group	Constans	Fringe length	The actual length of the wool fiber	
				Thick woolen fiber	Nap
Males	Winter fetus	X±m	13,5±0,22	14,5±0,29	7,3±0,10
		σ	0,32	0,66	0,65
		C_v	2,37	4,55	8,90
	Spring fetus	X±m	11,0±0,20	12,0±0,23	5,0±0,13
		σ	0,78	0,81	0,52
		C_v	7,09	6,75	10,40
Females	Winter fetus	X±m	13.7±0,35	9,5±0,67	7,0±0,09
		σ	0,95	0,63	0,54
		C_v	6,93	6,63	7,71
	Spring fetus	X±m	10,8±0,25	11,5±0,26	5,2±0,19
		σ	0,73	0,85	0,55
		C_v	6,76	7,39	10,57

TABLE 5. Meat productivity indicators of the fetus depending on the season in sheep at different ages (n=5). (X±m)

Time of birth	Weight before cutting, kg	Carcass weight, kg	Carcass extract,%	internal fat, kg	Fat extract, %	cutting weight, kg	Cutting extract%
			9 Month				
Winter fetus	33,5±0,71	15,75±0,45	47,01	0,63±0,20	1,89	16,38±0,56	48,9
Early spring fetus	28,0±0,70	12,32±0,37	44,0	0,39±0,13	1,40	12,71±0,43	45,40
Spring fetus	24,0±0,75	10,56±0,32	44,0	0,30±0,12	1,25	10,86±0,49	45,25
			12 Month				
Winter fetus	36,0±1,34	17,10±0,48	47,5	0,82±0,21	2,27	17,92±0,49	49,77
Early spring fetus	32,0±1,31	14,30±0,33	44,7	1,50±0,13	1,26	14,70±0,41	45,96
Spring fetus	26,0±0,78	11,59±0,35	44,6	1,45±0,12	0,65	11,77±0,31	45,25
			15 Month				
Winter fetus	39,0±1,56	18,95±0,51	48,60	2,40±0,25	2,30	19,85±0,55	50,90
Early spring fetus	33,0±1,34	14,98±0,50	45,40	2,0±0,20	1,36	15,43±0,50	46,76
Spring fetus	30,0±1,29	13.48±0,49	44,93	1,7±0,16	0,96	13,99±0,51	46,63

TABLE 6. Chemical composition of meat (n=3)

Groups of animals	İndicators					Calorie content of 1 kg of meat, kcal
	Water	Protein	Fat	Cartilages	Dry matter	
Winter fetus	62,5	20,67	15,73	1,10	37,5	2310,36
Early spring fetus	65,38	19,79	13,79	1,04	34,62	2093,86
Spring fetus	67,68	18,15	13,06	1,21	32,42	1958,93

TABLE 7. Comes net by live weight

Groups	Gender	Live weight of 1 head for meat, kg	The price of 1 kg of live weight	General gain, manat	Total cost incurred, manat	Net profit, man.
Winter fetus	Male	45,5	9	409,5	136,3	273,2
Spring fetus	Male	38,3	9	344,7	114,9	229,8

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