PARTICULARITIES OF MILK PRODUCTION TO THE KARAKUL EWES

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Abstract

The purpose of this scientific paper was to reveal the veritable biological particularities of the lactation curve to the Karakul ewes in similar feeding conditions, during the sensitive period of the first 3 months after calving. The research was carried out on Karakul ewes flocks of the "Kotovskii" sovkhoz, Causeni district, Republic of Moldova. Research has shown that the daily milk production of ewes, calved in January and maintained in the stable in relatively good feeding conditions, in the first 20 days after calving, was sufficient (0.98-0.96 kg/day), for the Karakul race. The increase in the body mass of a lamb in 20 days was 3.78-3.90 kg, or 189-195 g/day. The specific milk consumption at the formation of 1 kg of live mass increase of lambs in the first 20 days after birth was 5.18-4.92 kg. To the Karakul sheep, the daily milk production decreases, even from the first 10 days after calving, by 0.14 kg (from 1.05 kg every 10 days to 0.91 kg every 20 days), or by 13.3% (t_d = 2.8; P <0.01). With the aging of lambs after birth from 20 to 60 days, there is a sudden drop in the daily quantity of milk of ewes (from 0.96 to 0.39 kg), the daily increase in body mass of the lamb (from 195 to 112 g/day), as well as the specific consumption of milk at the formation of 1 kg of live mass increase of lamb (from 4.92 to 3.50 kg). The biological curve of lactation of Karakul ewes represents a slightly downward line (from 1.05 to 0.96 kg/day) in the first 20 days after calving, with a sudden drop (from 0.96 to 0.39 kg/day) at the 60-day interval and a slow decrease (from 0.390 to 0.209 kg/day) at the 139-day interval and until the end of lactation. The Asian Karakul sheep race is an aboriginal, rustic and highly conserved one from the physiological (genetic) point of view of the rather limited lactogenic potential. Between the quantity of milk sucked/milked on the control day and the quantity of milk, produced by Karakul ewes throughout lactation, there is a fairly close correlation at all control intervals (r_{xy} = 0.624 - 0.778). Based on the elucidated correlations, the sonication coefficients were deduced, which can be used to determine by rapid method the milk production of Karakul ewes, calved in the last decade of January.

Key words: particularities, lactation, Karakul ewes, biological curve

INTRODUCTION

In most countries of the world, ewes milk is one of the main productions in sheep, due to the fact that it is a valuable protein food for humans. The exploitation of sheep for milk production is an ancient concern and one of the most accessible for the rural population.

According to our research [6], based on FAO data [24], more than 1129 sheep races are growing in the world. In different geographical areas of the world were created by humans, growing and spread those races of sheep, which met the requirements of society, corresponded more adequately to local traditions and pedo-climatic conditions.

In some countries, specialized races of sheep (Ostfriz, Awassi) have been created through long selection, with high milk production, reaching over 300-400 kg per lactation [27].

In other countries, including the Republic of Moldova, indigenous races with mixed production skills (wool-milk, wool-meat-milk, furskins-milk), well adapted to local pedo-climatic and local fodder conditions, are traditionally bred with milk production. averages and submedia [25, 29, 30].

The Karakul sheep races was created in Central Asia, in arid and extensive pedo-climatic conditions, which allowed the maintenance of sheep grazing throughout the calendar year, with minimal costs.

In the Republic of Moldova this race was first imported from Turkestan in 1884 in

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The manuscript was received: 23.06.2020
Accepted for publication: 03.04.2021

order to improve the furskin qualities of lambs, by crossing local ewes Țușca with Karakul rams [7].

This was followed by the neighboring country Romania, which undertook imports of Karakul sheep and crosses of the local Țurcana race [9, 19-22], based on which the new Karakul de Botoșani sheep race was created.

Research [3, 6, 7, 25] has shown that the cross-absorption of local ewes from the Țușca race with Karakul rams has contributed to the improvement of the furskin qualities of cross-breed lambs, but also caused the decrease of production milk of metis ewes, decreasing their resistance to disease and weathering.

Therefore, increasing milk production in Karakul ewes has been and remains a permanent priority in the activity of sheep selectors and breeders in the Republic of Moldova.

Our multiple researches [1-5], as well as other researchers [8, 9, 11, 15, 16, 18, 25, 27], show that the milk production of ewes is influenced by a number of biological factors (genetic) and environmental. Achieving the skills of the biological potential of ewes milk production requires knowledge of all the particularities of lactation race in different periods from calving. By creating optimal conditions for the care and advanced feeding of ewes during sensitive periods of lactation, the sheep breeder can contribute to the fullest possible realization of the lactogenic potential of the ewes body. The sensitive period of lactation means the interval of days after calving, in which the advanced nutrition of the ewes has a maximum effect of increasing or, at least maintaining a high level, the daily milk production.

According to some authors [15], the evolution of the daily milk production of ewes „*is expressed graphically by a curve, which has an ascending branch and a descending one. Depending on the breed, the peak of the lactation curve can occur either 15-20 days after calving or 30-50 days* ". The same author mentions that, „*in the Țigaie and Țurcana races, the peak of the lactation curve is reached in the case of spring calvings, in the second or third month of lactation. This moment practically coincides with the months when the vegetation is abundant (May, June), while at Karakul, this level is reached in the first month and, less frequently, in the second"*. Such an evolution of ewes milk production is noted by other authors [11, 17, 23].

According to the data of Răducuță I. et al [18], in the Țurcană race in Romania, ewes calveds in March reach the maximum daily milk production in the third month of lactation (at the control on May 21) with 804 g/day. According to Mochnacs M. [11], the maximum daily milk production in ewes is generally reached between the second and third months of lactation and usually coincides with the beginning of the grazing period.

It should be mentioned that the above-named researchers highlighted the evolution of the de facto lactation curve, but not the biological one. This de facto lactation curve is greatly influenced by the conditions of poor nutrition in the stables (February, March and mid-April) and rich nutrition in the months of grazing (late April, May, June). Therefore, in order to elucidate the biological particularities of lactation in ewes, a similar, optimal and stable feeding is necessary in at least the first 3 months of the sensitive lactation period, starting after calving.

In this context, the purpose of this scientific paper was to reveal the veritable biological particularities of the lactation curve in Karakul ewes in similar feeding conditions, during the sensitive period of the first 3 months after calving.

MATERIALS AND METHODS

The scientific researches were carried out on the Karakul ewes flocks of the "Kotovskii" sovkhoz, Causeni district, Republic of Moldova. In order to ensure similar feeding conditions for the ewes in the first 3 months of the sensitive lactation period after calving, the respective insemination of the ewes was organized in August with the obtaining of calvings in January. Feeding the ewes during the stable period (January-April) was quite good and advanced by 30-40% above the zootechnical norms after Tomma [32]. In the ration, the ewes received alfalfa hay, corn silage in the milk-wax phase, fodder beets, granules from matured corn cobs, granules from the whole barley plant (spike with matured grains + straw stalk).

Ewes milk production was determined in two series of experiments.

In the first series of experiments, performed on a batch of 29 ewes calved on January 9 with suckled lambs, the main objective was to reveal the specific consumption of milk per kilogram of live mass increase of lamb in the first 20 days after birth.

In the second series of experiments, performed on a batch of 20 ewes calved on January 24 with suckled lambs, the main objective was to reveal the particularities of the biological curve of the entire lactation in Karakul ewes. For the most accurate assessment of the milk production of ewes in the first 90 days of lactation (lactation period of lambs), the daily milk production was determined by the most accurate method known - the method of control lamb suckling [26]. The essence of this method is to separate the lambs from their mothers for a fixed period of 4-8 hours (depending on the age of the lambs) and admit them for 10-15 minutes for sucking. At the age of 10 and 20 days, the separation and admission of lambs to the soup was performed 8 times a day (in 24 hours), every 4 hours. At the age of 40 and 60 days, the separation and admission of lambs to sucking was performed 4 times/day, every 6 hours. At the age of 90 days, the separation and admission of lambs to sucking was performed 3 times/day, every 8 hours. In each period, the lambs were weighed individually before sucking and after sucking, on the postal scale with the precision of 10 grams. The difference between the body weight of the lamb after sucking and that before sucking was the quantity of milk produced by the ewes and the sucking of the lamb during that period. The sum of the quantities of milk sucked in all periods during 24 hours is the amount of milk produced by the ewes per day.

After weaning the lambs (at 90 days), the daily milk production of the ewes was determined by control milking according to the method of T. Nica [12, 13]. The technical principle of control of milk production, carried out by this method, consists in the fact that the ewes are subjected to control milking every 15 days. Milking is done once a day, usually in the morning milking. To determine the quantity of milk produced by the ewes throughout the control day, the quantity of milk produced by it on the morning of the control day is multiplied by the control coefficient. This coefficient is determined by the formula:

$$K_c = \frac{Pt}{Pd} \cdot C_r$$

wherein:

K_c – control coefficient;

P_t – the total quantity of milk milked from lactating ewes on the control day;

P_d - the quantity of milk milked from lactating ewes in the morning of the control day;

C_r – milk retention coefficient:

- for ewes in the first two weeks after weaning the lambs C_r=1,2;
- for other lactating ewes C_r=1,0.

To control the quantity of milk, each ewes was milked individually in a bucket, then the milk was weighed on an electronic scale with a capacity of 1000 g, after which the milk was poured into the storage can.

Data on the registration number of each ewes milked and the quantity of milk milked for control were entered in the Milk Production Control Sheet (F-8K). Subsequently, the data from the control sheet were transcribed in the Register of evidence of milk production in Karakul ewes (F-7K), in which the individual calculation of the milk production of each ewe for each control period was performed. By summing the quantities of milk calculated in all control periods, the total milk production of each ewe on the entire lactation was deducted.

Based on the daily milk production obtained during the control days, the biological curve of lactation of Karakul ewes, calved in January, was constructed.

The linear correlation coefficient (r_{xy}) between the quantity of milk produced by the ewe per day in different periods and the total quantity of milk produced by the ewe during the whole lactation was determined on the electronic computer by the Filles Correlations Program.

Based on the ratio of milk production to the whole lactation and the daily quantity of milk produced by the ewe on the control day

in different periods of lactation, the sampling coefficients were calculated and proposed, which can be used to quickly determine the milk production of ewes, calved in January from the individual sector of the holders, performing only one control milking in any lactation period.

The data obtained as a result of the research were statistically processed using the computer software "STATISTICS - 12" and their certainty was assessed, according to the biometric variational statistics, according to the methods of Плохинский Н.А., 1989 [28].

RESULTS AND DISCUSSIONS

The results of the research, carried out in the first series of experiments, showed that the daily milk production of Karakul ewes, calved on January 9 and maintained at the stable in relatively good feeding conditions, was good enough for the Karakul race in the first 10 days after calving. (Tab. 1).

Table 1 Quantity of milk suckled by Karakul lambs, borns on **09 January** (N = 29)

Time control sucking milk	Lamb body weight (kg), M±m At birth = 4.50±0.10		Sucked milk, kg
	Before sucking	After sucking	
(Separation of lambs every 4 hours, starting with the hour 10^{00})	*At 10 days after birth (19.01)*		
The hour 14^{00}	6.05±0.15	6.27±0.15	0.22±0.01
The hour 18^{00}	6.10±0.15	6.27±0.15	0.17±0.01
The hour 22^{00}	6.14±0.15	6.31±0.15	0.17±0.01
The hour 02^{00}	6.15±0.15	6.32±0.15	0.17±0.01
The hour 06^{00}	6.30±0.15	6.47±0.15	0.17±0.01
The hour 10^{00}	6.37±0.15	6.52±0.15	0.15±0.01
Total milk sucked per day = 1.05±0.04			
(Separation of lambs every 4 hours, starting with the hour 10^{00})	*At 20 days after birth (29.01)*		
The hour 14^{00}	7.92±0.20	8.06±0.20	0.14±0.01
The hour 18^{00}	7.93±0.20	8.09±0.20	0.16±0.01
The hour 22^{00}	7.92±0.20	8.09±0.21	0.16±0.01
The hour 02^{00}	7.95±0.20	8.12±0.20	0.17±0.01
The hour 06^{00}	8.06±0.21	8.18±0.21	0.12±0.01
The hour 10^{00}	8.12±0.20	8.28±0.21	0.16±0.01
Total milk sucked per day = 0.91±0.03			

In the experimental batch of 29 ewes, their lambs at the age of 10 days sucked an average of 1.05 kg of milk per day (24 hours). Every 4 hours the lambs sucked an average of 0.17 kg of milk. The smallest quantity of milk (0.15 kg) the lambs sucked at 10^{00} hours, and the largest quantity (0.22 kg) of milk they sucked at 14^{00} hours. In 10 days a lamb sucked a total of 10.5 kg of milk on average. The increase in body weight of a lamb in 10 days was 2.02 kg (6.52-4.50 kg), or 202 g/day.

The specific milk consumption at the formation of 1 kg of live mass increase of lambs in the first 10 days after birth was 5.20 kg (10.5 kg : 2.02 kg). Between 10 and 20 days after calving, the daily milk production of the ewes decreased by 0.14 kg (from 1.05 kg to 0.91 kg), or by 13.3% (td = 2.8; P <0.01).

From this experiment we can conclude that, to the Karakul ewes, the daily milk production decreases even from the first 10 days after calving. The lambs sucked on average on the experimental group 0.91± 0.03 kg of milk per day. Every 4 hours the lambs sucked an average of 0.15 kg of milk. The smallest quantity of milk (0.12 kg), the lambs sucked at 06^{00} hours, and the highest quantity of milk (0.17 kg) sucked it at 02^{00} hours.

During this period (from 10 to 20 days) a lamb consumed a total of 9.1 kg of milk per batch and gained an average weight of 1.76 kg (8.28 kg - 6.52 kg), or 0.176 kg/day. The specific milk consumption for the formation of 1 kg of live mass increase of lambs in the period from 10 to 20 days was 5.17 kg (9.10 kg : 1.76 kg).

In total, throughout the first experiment, from birth to 20 days, each lamb sucked an average of 19.6 kg of milk (10.5 kg + 9.1 kg), or 0.98 kg/day. The addition of the body weight of a lamb during that period was on average 3.78 kg (8.28 kg - 4.50 kg), or 0.189 kg/day. The specific milk consumption for the formation of 1 kg of increase in body mass of the lamb, during this period, constituted on average per batch 5.18 kg (19.6 kg : 3.78 kg).

It is considered that, up to 20 days, the lamb adds weight due to the exclusive consumption of breast milk, because, other feed during this period, the lamb does not digest.

The knowledge of the specific milk consumption per 1 kg of increase in body mass of the lamb in the period from birth to 20 days allows the calculation of ewes milk production by the method of weighing the lamb at birth and at 20 days.

This method of determining the milk production of sheep in the first 20 days after calving is more accurate than the method of separating the lambs for 12 hours and controlling the milking of the ewes, because in this case, in mothers of separated lambs it persists. a strong instinct to retain milk at control milking up to 50-90%.

In the second series of experiments, performed on another batch of 20 ewes with suckled lambs, calved on January 24, we continued the research to evaluate the milk production of ewes by the method of control sucking for a longer period - up to 90 days (Tab. 2).

Table 2 Quantity of milk suckled by Karakul lambs, borns on **24 January** (N = 20)

Time control sucking milk	Lamb body weight (kg), M±m At birth = 4.60±0.10		Sucked milk, kg
	Before sucking	After sucking	
(Separation of lambs every 4 hours, starting with the hour 13^{00})	*At 20 days after birth (13.02)*		
The hour 17^{00}	7.88±0.22	7.98±0.23	0.10±0.01
The hour 21^{00}	7.92±0.22	8.09±0.23	0.17±0.01
The hour 01^{00}	8.00±0.23	8.20±0.23	0.20±0.02
The hour 05^{00}	8.15±0.22	8.25±0.21	0.10±0.01
The hour 09^{00}	8.18±0.23	8.36±0.23	0.18±0.01
The hour 13^{00}	8.29±0.22	8.50±0.23	0.21±0.01
Total milk sucked per day = 0.96±0.04			
(Separation of lambs every 6 hours, starting with the hour 06^{00})	*At 40 days after birth (05.03)*		
The hour 12^{00}	11.49±0.38	11.62±0.38	0.13±0.01
The hour 18^{00}	11.45±0.39	11.63±0.38	0.18±0.01
The hour 24^{00}	11.49±0.38	11.67±0.39	0.18±0.01
The hour 06^{00}	11.51±0.38	11.69±0.39	0.18±0.01
Total milk sucked per day = 0.67±0.04			
(Separation of lambs every 6 hours, starting with the hour 06^{00})	*At 60 days after birth (25.03)*		
The hour 12^{00}	13.69±0.65	13.80±0.66	0.11±0.02
The hour 18^{00}	13.73±0.65	13.82±0.66	0.09±0.03
The hour 24^{00}	13.77±0.66	13.90±0.67	0.13±0.04
The hour 06^{00}	13.86±0.68	13.92±0.68	0.06±0.01
Total milk sucked per day = 0.39±0.03			
(Separation of lambs every 8 hours, starting with the hour 06^{00})	*At 90 days after birth (24.04)*		
The hour 14^{00}	17.13±0.80	17.22±0.81	0.09±0.01
The hour 22^{00}	17.17±0.79	17.30±0.80	0.13±0.03
The hour 06^{00}	17.26±0.82	17.40±0.81	0.14±0.02
Total milk sucked per day = 0.36±0.03			

We found that in the first 20 days after calving, the daily milk production of Karakul ewes, calved in the third decade of January, maintained at the stable in relatively good feeding conditions, was sufficient (0.96 kg/ day) for the Karakul race. In this batch, lambs birth on January 24, at the age of 20 days, sucked on average 0.96 kg of milk per day (24 hours). Every 4 hours the lambs sucked an average of 0.16 kg of milk. The smallest quantity of milk (0.10 kg) the lambs sucked at 17^{00} and 05^{00} hours, and the highest quantity of milk (0.21 kg) they sucked at 13^{00} hours. In 20 days a lamb total sucking on average per batch 19.2 kg of milk. The increase in the body weight of a lamb in 20 days was 3.90 kg (8.50 - 4.60), or 0.195 kg/ day (3.90 : 20). The average specific milk consumption at the formation of 1 kg of live mass increase of lambs, in the period of 20 days after birth, was 4.92 kg (19.2 kg : 3.90 kg).

Subsequently, at the age of 40 days, lambs separated from their mothers were allowed to suckle every 6 hours. It was found that in the period from 20 to 40 days after calving, the daily milk production of Karakul ewes decreased significantly by 0.29 kg (from 0.96 to 0.67 kg), or by 30,2% (td = 5.8; P <0.001). At the age of 40 days, lambs sucked on average 0.67 kg of milk per day (24 hours). Every 6 hours, the lambs sucked an average of 0.17 kg of milk. The smallest quantity of milk (0.13 kg) the lambs sucked at 12^{00} hours, and the largest quantity of milk (0.18 kg) they sucked at 18^{00}, 24^{00} and 06^{00} hours. In 20 days of this period, each lamb sucked an average of 13.4 kg of milk per batch. The increase in body weight of a lamb in the period from 20 days to 40 days was a total of 3.19 kg (11.69 kg - 8.50 kg), or 0.160 kg/day (3.19 kg : 20 days). The specific milk consumption for the formation of 1 kg of live mass increase of lambs, in the period from 20 to 40 days after birth, was on average 4.2 kg (13.4 kg : 3.19 kg).

As can be seen, the specific consumption of milk per 1 kg of increase in this period decreased, compared to the period of the first 20 days, by 0.72 kg, or 14.6% (P <0.01). This is explained by the fact that, during this period, the lambs begin to digest vegetable fodder, which contributes to the increase of a part of the increase in body weight.

At the age of 60 days, lambs separated from their mothers were also allowed to suckle every 6 hours. During this period, from 40 to 60 days after calving, the daily milk production of Karakul ewes decreased significantly by 0.28 kg (from 0.67 to 0.39), or by 41.8% (td = 5.6; P <0.001). Every 6 hours, the lambs sucked an average of 0.10 kg of milk. The smallest quantity of milk (0.06 kg), the lambs sucked at 06^{00} hours, and the highest quantity of milk (0.13 kg) they sucked at 24^{00} hours. In 20 days of this period, a lamb sucked an average of 7.8 kg of milk per batch. The increase of the body mass of a lamb in the period from 40 to 60 days constituted in total 2.23 kg (13.92 - 11.69 kg), or 0.112 kg/day (2.23 : 20 = 0.112). The specific milk consumption at the formation of 1 kg of live mass increase of lambs, in the period from 40 to 60 days after birth, continued to decrease and amounted to an average of 3.50 kg (7.8 kg : 2.23 kg).

At the age of 90 days, lambs separated from their mothers were allowed to suckle only three times a day, every 8 hours. During this period, from 60 to 90 days after calving, the daily milk production of Karakul sheep decreased insignificantly from 0.39 to 0.36 kg of milk. The insignificant decrease in ewes milk production during this period is explained by the fact that, on the day of the control sucking (April 24), the ewes had already been grazed for several days. This helped to maintain the ewes daily milk production, practically at the level reached on the 60-th day after calving. Every 8 hours, the lambs sucked an average of 0.12 kg of milk. The smallest quantity of milk (0.09 kg) the lambs sucked at 14^{00} hours, and the highest quantity of milk (0.14 kg) they sucked at 06^{00} hours. Within 30 days of this period, one lamb sucked an average of 10.8 kg of milk per batch. The increase in the body mass of a lamb in the period from 60 days to 90 days was a total of 3.48 kg (17.40 - 13.92 kg), or 0.116 kg/day (3.48 : 30 = 0.116). The specific milk consumption at the formation of 1 kg of live mass increase of lambs, in the period from 60 to 90 days after birth, continued to decrease and amounted to an average of 3.10 kg (10.8 kg : 3.48 kg).

Generalizing the above data, we can conclude that with the aging of lambs after birth up to 90 days, there is a significant decrease in both the daily quantity of milk suckled (ewes milk production) and the daily increase in live mass of lamb, as well as the specific consumption of milk at the formation of 1 kg of increase in body mass of the lamb.

After weaning the lambs (at the age of 3 months), the amount of milk produced by the ewes was determined by control milking (Tab. 3).

Table 3 Milk production of Karakul ewes, calved on **24 January** (N = 20)

Date of control	13.02	05.03	25.03	24.04	11.05	25.05	12.06	Total on lactation
Number of days after calving	20	40	60	90	107	121	139	x
Duration of the control period, days	20	20	20	30	17	14	18	139
Daily quantity of milk under control, kg	0.96	0.67	0.39	0.36	0.332	0.243	0.209	0.460
Quantity of milk during the control period, kg	19.20	13.40	7.80	10.80	5.64	3.40	3.76	64.00

It was found that the daily milk production of ewes after weaning the lambs continued to decrease during the grazing period. Thus, at the control milking on May 11, which corresponded to 107 days after calving, the daily milk production in ewes was on average 0.332 kg, decreasing, compared to the control milking on April 24, by 7.8% (P <0.01).

At the control milking on May 25, which corresponded to 121 days after calving, the daily milk production was on average 0.243 kg, decreasing, compared to the control milking on May 11, by 26.8% (P <0.001).

At the last control milking on 12 June, which coincided with 139 days after calving, daily milk production averaged 0.209 kg, down 14.0% from the control milking on 25 May (P <0.001).

After June 12, the daily milk production of the sheep obviously decreased and after 10-12 days from the last control milking, their lactation stopped permanently.

Based on the results obtained from the control suckling of the lambs and the control milking of the ewes, the biological curve of lactation of the Karakul ewes was built, calved in the last decade of January (Fig. 1).

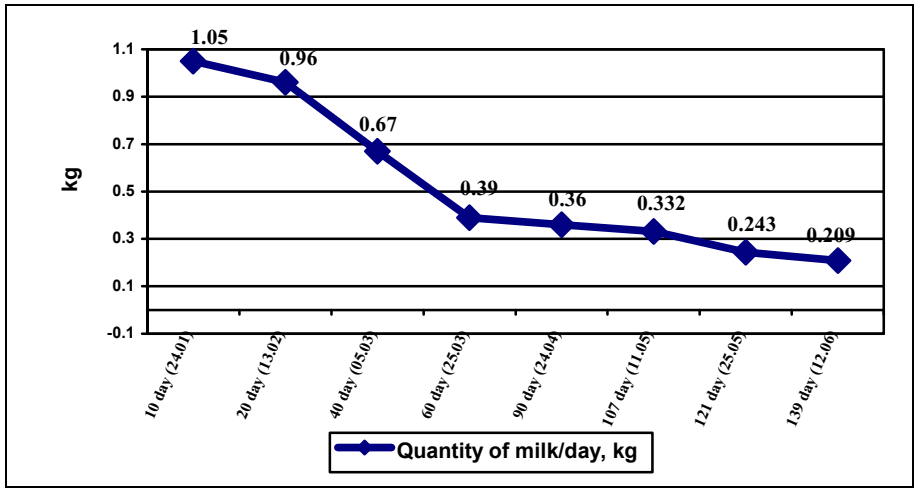

Fig. 1 Karakul ewes lactation curve calved on January 24th

The illustration in the diagram shows that, despite the fact that the feeding conditions of Karakul sheep were similar in the first three months after calving, under stable conditions, the daily milk production of the ewes shows a slower downward curve in the first 20 months. days after calving, with a sudden drop in the period from 20 to 60 days of lactation. Subsequently, although the ewes grazed, benefiting from a richer diet due to the vegetation in the pastures, the lactation curve continued to decrease to very low daily quantity of milk (0.36 kg/day at 90 days after calving, 0.322 kg/day at 107 days, 0.243 kg/day at 121 days of lactation and 0.206 kg/day at 139 days after calving).

Based on this research, it was concluded that the Asian Karakul sheep race is an aboriginal, rustic and highly conserved from a physiological (genetic) point of view of the rather limited lactogenic potential. In the process of phylogeny, this race has formed a low lactogenic potential, similar to the wild subspecies of the ovis ancestors, which ensures only the urgent need for offspring (lamb) in the first 20 days and partially in the first month after birth. Starting with the second month after birth, the lamb is forced to meet its food needs from the grassy vegetation, which in April-May, in the semi-desolate conditions of Central Asia, is sufficiently juicy and vitamin, after which it dries on the stem, becoming a kind of hay, or multi-flowered straw for the natural food of herbivores. This explains why the Karakul ewes do not have biological milk reserves for human commercial purposes. This hypothesis is confirmed by the specific biological curve of daily milk production, which is constantly decreasing even from the first 10 days after calving.

The descending character of the biological curve of daily milk production in Karakul sheep has been confirmed by us in several previous researches [1, 3-5, 7].

With all due respect to the authors of other research [8-10, 31, 33], regarding the milk production of Karakul ewes of different regional types, unfortunately, in their works, the problem of the biological curve of daily milk production is not sufficiently elucidated, because the feeding conditions for lactating ewes in the first three months after calving were not similar.

In this context, we accept the hypothesis that the biological curve of daily milk production in other races (Merinos, Ţigaie, Ţurcana, etc.), except for the specialized ones (Ostfriză, Awassi), could have a decreasing character from the very first month after calving. However, the evolution of the biological curve of daily milk production must be demonstrated in special research, carried out under similar conditions of feeding the ewes in the first three months after calving.

In addition to elucidating the character of the biological curve of daily milk production in Karakul ewes, research has shown that there is a fairly close correlation between the quantity of milk suckled/milked on the control day and the quantity of milk produced by ewe throughout lactation, all control intervals (stages) after calving (Tab. 4).

Table 4 Linear correlation coefficient (r_{xy}) between the quantity of milk per day in different periods and the total quantity of milk throughout lactation

Correlation coefficient (r_{xy}) the stage:	r ± m_r	t_r	P
$r_{20\ day}$	0.624 ± 0.184	3.39	<0.01
$r_{40\ day}$	0.725 ± 0.162	4.47	<0.001
$r_{60\ day}$	0.778 ± 0.148	5.26	<0.001
$r_{90\ day}$	0.738 ± 0.159	4.64	<0.001
$r_{107\ day}$	0.722 ± 0.163	4.43	<0.001
$r_{121\ day}$	0.698 ± 0.168	4.15	<0.001
$r_{139\ day}$	0.721 ± 0.163	4.42	<0.001

The linear correlation coefficient (r_{xy}) between the daily quantity of milk in different periods and the total quantity of milk produced by the ewe on the whole lactation has a high value and falls within the limits of 0.624 - 0.788. The certainty criterion (t_r) of these correlations is of the highest threshold of the probability theory of error-free predictions after Student (P <0.001).

In the context of the correlations found, it was concluded that these (correlations) could be used as a basis for developing a simplified method for the rapid determination of ewes milk production throughout lactation, called the rapid sampling method.

For the first time, the method of rapid determination of milk production in ewes by the sampling coefficient was described by Prof. Tudor Nică, 1952 [14]. For Țigaie ewes, calved in March-April, the sampling coefficients were calculated according to the period from calving to the day of the control milking [23].

In our research, the sampling coefficients of the daily milk production for Karakul ewes in the last decade of January were calculated. For this, in each concrete control period of milk production the sampling coefficients were determined by relating the quantity of milk obtained on the whole lactation to the quantity of daily milk obtained at control (Tab. 5).

Table 5 Production sampling coefficient of milk on the entire lactation of the ewes calved in the last decade of January (24.01)

Nr. of days from calving	The quantity of milk sucked /milked, kg/day	Survey coefficient
At 20 days	0.96	66.7
At 40 days	0.67	95.5
At 60 days	0.39	164.1
At 90 days	0.36	177.8
At 107 days	0.332	192.8
At 121 days	0.243	263.4
At 139 days	0.209	306.3

We would like to mention that, in the Republic of Moldova, the determination of ewes milk production by the rapid survey method is, first of all, of practical importance, because 99% of sheep are in the possession of individual (private) owners and are not included. in the control milking system.

At the same time, at any particular sheepfold, in the flock of sheep, among the individuals of the batch of plus variants, there are ewes-recorders after milk production, which have an extraordinary genetic value.

Having the sampling coefficients at the respective stages and performing, in summer, at any sheepfold only one milking of ewes control, we can detect the record-keeping ewes for taking them in the zootechnical record of valuable individuals after milk production. The revelation of these highly productive ewes through the rapid sampling method and their rational use for the reproduction of the breeding material, would allow the creation of valuable nuclei (flocks) of sheep with increased milk production.

For the widespread application of the rapid sampling method for ewes milk production, it is necessary to broaden the research spectrum of the lactation curve of Karakul ewes, calved in each decade of February, March, April and May.

CONCLUSIONS

1. In two series of experiments, the daily milk production of Karakul ewes, calved in January and kept in the stable in relatively good feeding conditions, in the first 20 days after calving, was sufficient (0.98-0.96 kg / day) for the Karakul race. The increase in body weight of a suckled lamb in 20 days was 3.78-3.90 kg, or 189-195 g/day. The specific milk consumption at the formation of 1 kg of live mass increase of lambs in the first 20 days after birth was 5.18-4.92 kg.

2. To the Karakul ewes, daily milk production decreases from the very first 10 days after calving. Between 10 and 20 days after calving, the daily milk production of the ewes decreased by 0.14 kg (from 1.05 kg to 0.91 kg), or by 13.3% (td = 2.8; P <0.01).

3. With the aging of Karakul lambs after birth from 20 to 60 days, there is a sudden and significant drop in the daily quantity of milk of ewes (from 0.96 to 0.39 kg), the daily increase in mass body weight of the lamb (from 195 to 112 g/day), as well as the specific consumption of milk at the formation of 1 kg of live mass increase of the lamb (from 4.92 to 3.50 kg).

4. After 60 days of calving, the daily milk production of the ewes continued to decrease slowly from 0.39 kg to 0.209 kg, at 139 days after calving.

5. Based on the evolution of daily milk production, the biological curve of lactation of Karakul ewes was deduced and constructed, which represents a slightly descending line (from 1.05 to 0.96 kg/day) in the first 20 days after calving, with a fall sudden (from 0.96 to 0.39 kg/day) at the interval of 60 days and a slow decrease (from 0.39 to 0.209 kg/day) at the interval of 139

days and until the end of lactation (150 days). Knowing the particularities of the biological curve of lactation in different periods from calving, allows directing the management of milk production in ewes, by creating optimal conditions for their care and feeding during sensitive periods of lactation.

6. The Asian Karakul sheep race is an aboriginal, rustic and highly conserved one from the physiological (genetic) point of view of the rather limited lactogenic potential.

7. Between the quantity of milk sucked/ milked on the control day and the quantity of milk, produced by Karakul ewes throughout lactation, there is a fairly close correlation at all control intervals (r_{xy} = 0.624 - 0.788).

8. Based on the elucidated correlations between the daily milk production and the entire lactation, the sonication coefficients were deduced, which can be used to determine by rapid method the milk production of Karakul ewes, calved in the last decade of January.

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