Global Journal of Medical Research: G
Veterinary Science and Veterinary Medicine
Volume 20 Issue 4 Version 1.0 Year 2020
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals
Online ISSN: 2249-4618 & Print ISSN: 0975-5888

Productive and Biological Characteristics of Growing Sheep with Different Genotypes

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Generally having analyzed the effectiveness of crossbreeding, including the received gains in weight, milking capacity, we have become convinced of its advantage. The advantage of crossbred growing sheep has to do with a degree of expression of heterosis effect. The quantity of products derived from crossbred lambs was significantly greater at fewer costs for its production.

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GJMR-G Classification: NLMC Code: QW 70

Strictly as per the compliance and regulations of:

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I. Introduction

The breeds cultivated in the republic were mainly of wool-mutton, mutton-wool and mutton-fat-wool productive direction. Along with that no less important was sheep's dairy productivity upon which the preservation, vitality, growth and development of lambs depend, and generally the state of herd reproduction.

The sheep's milk is a full value food product notable for its highest dietary properties and well digested. The valuable types of hard and soft cheese and different fermented milk products were made of it.

The world experience shows that in many countries a sheep breeding of dairy line has a priority meaning. More than 15 names of food products produced from sheep's milk are highly appreciated in Bulgaria, France, England, Italy, Germany, Israel, Syria, Jordan, and Turkey. For a long time an independent cheese industry was functioning in these countries.

Many scientists and professionals in the CIS countries have studied the sheep's dairy productivity at different times [1;4;6;].

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In Kyrgyzstan a number of scientists have studied the issue of sheep's dairy productivity or raised it as a problem at different periods of creation and improvement of breeds [2;3;5;6].

II. The Material and Research Methods

We have organized two groups of ewes according to analog method. The breeding stock in both groups was represented by local hair sheep. The first experienced group of ewes was artificially bred by sperm of sheep of Israeli dairy breed Awassi. The second control group of ewes was bred by local hair sheep.

We have studied a growth and development of growing sheep, change in body weight, by individual weighing at different age period; characteristics of exterior were determined by calculation of body type indexes.

The ewes' dairy productivity was studied according to methods of Y.I.Imigeev and others (2007).

The milk yield was taken into account by the following method. In the evening prior to record milking, lambs were separated from ewes and maintained individually at night and in the morning, till the end of milking. When lambs separated, all ewes are stripped rapidly but the milk obtained was not taken into account.

In the morning of record day, i.e. precisely in 12 hours after evening stripping, they conducted record milking of ewes, made individual measurement of milk quantity derived per sheep for the half of day. The milk yield was done per day by redoubling the quantity of drawn milk for the half of day. And for the control period we made calculations by multiplying obtained amount to number of days of such period. By summing up the sheep's milk yielding capacity for control periods, we have identified them as lactation and calculated the average daily milk output.

We have determined the amount of days of the first control period by summing up the days from lambing to record day + record day + 7 days thereafter.

The second record was done at the 14th day after the first and it was equal to 14 days. The third record was done at the 21st day after the second. The control period was equal to 28 days. The following sequential control records were conducted after each 28 days.

The chemical composition of sheep's milk has been studied according to methods of G.S.Inikhova, K.P. Brio. (1971).

We have studied clinical and hematological indications in animals per group based on the commonly accepted methods. We have examined a pulse, respiratory rhythm, body temperature, number of formed elements and percent of content of hemoglobin in blood by methods of Kudryavtsev A.A. and Kudryavtseva L.A. (1974), Vasilieva A.A. (1948), Nikitina V.N. (1949) and others.

All digital materials were processed by methods of variation statistics (Plokhinskiy N.A. 1969).

III. The Results and their Discussion

The first generation crossbreeds had the body weight by birth: growing sheep 4,4 kg, ewes - 4,2 kg., the body weight of crossbred sheep at weaning was 34,7±0,41 kg on average or by 2,2 kg (6,8%) more than in controlled group. The body weight of ewes in the experienced group was equal to 31,8±0,38 kg or 1,6 kg more (5,3%) more than in controlled group.

The body weight of crossbred sheep aged 8 month was 43,3±0,53 kg on average with fluctuation between 35,6 - 48,1 kg, of ewes -40,8±0,32 kg on average ranging from 35,1 to 44,5 kg, in percent to control group, the advantage among crossbreeds was attributed to growing sheep -7,4 %, ewes - 6,0 %.

The body weight of growing sheep at one year of age was on average: crossbreeds - 50,3 kg, local hair sheep - 45,8 kg or 4,8 kg more in crossbreeds. The body weight of crossbred ewes was equal to 44,4 kg against 41,2 kg of local hair sheep or was greater to 3,2 kg.

At the age of 1,5 the crossbred animals surpassed their herd mates in body weight, growing sheep by 12,1%, ewes by 8,5 %. The variation factor on crossbred growing sheep was 6,8%, on local hair sheep - 5,7% or by 1,1% higher in crossbreeds. The correlation factor on crossbred ewes was also by 0,3% higher than in control group.

The absolute growth of growing sheep from weaning to eight-month was 8,6 kg, ewes - 9,0 kg, daily average growth -9,5 and was 10 g more in crossbreds than in control group. During from 8 to 12 month the crossbred growing sheep had 7,0 kg, local hair sheep - 5,5 kg, i.e. was 1,5 kg more in crossbreeds. The absolute growth of body weight in crossbred ewes for the given period was 3,6 kg, in control - 2,7 kg or was 0,9 kg more in crossbreeds.

In general, for the whole period of breeding, the absolute growth of body weight since birth till the age of 1,5 year in crossbred growing sheep was 68,89 кг, in local hair sheep - 61,4 kg or was 7,85 kg more in crossbreeds. The indications of ewes were accordingly 53,53 kg and 49,13 kg, or 4,4 kg more in crossbred animals.

In order to have more complete and objective assessment of growth and development of crossbred and well-bred growing sheep, we have done the exterior measurements and calculated the basic body type indexes of animals with various genotypes.

When studying the age specific changes in measurements within the experienced and control groups of lambs, the substantial difference was found in growth intensity and development of individual parts of body of growing sheep with different genotypes. All body statures of crossbreeds have surpassed local herd mates in growth and development.

With a view to study the impact of cross breeding of local hair sheep with sheep of dairy breed Awassi for milk producing ability, we have determined ewes' milking capacity. The milk producing ability has been determined by methods of Imigeev Y.I. and others. (2007).

Daily milk yield in crossbreeds was on average 0,774 l, in local hair sheep -0,461 l, or was 0,313 l more in crossbreeds. Milk yield for lactation was equal to 162,5 l. and 73,8 l accordingly, or was 88,7 l. lower in control group.

Table 1: Chemical composition of sheep's milk of different breed

Indicators	Unit of measure	Breed	
		AwxLh	LhxLh
Moisture	%	81,70	80,1
Dry basis	%	18,30	19,92
Protein	%	4,96	5,28
Fat	%	6,92	6,42
Lactose	%	5,55	7,32
Nonfat milk solids	%	11,4	13,5
Ash	%	0,89	0,90

Selection and quality assessment. Milk yield of ewes was 135,5 l. for 1 lactation and 204-173 l for 4-5 lactations (190-177 days), with content of fat up to 6,8 %, and protein -6,2%.

The content of dry basis in milk of crossbreeds Aw x Lh was 18,30 %, of local hair sheep - 19,92 % or higher by 1,62 %. The content of fat in crossbreeds' milk was higher by 0,50% than in control. For content of remained components such as protein, lactose, nonfat

milk solids and ash in sheep of control group, indicators are rather higher than in crossbreeds' milk.

We have studied the biochemical indicators of blood of experimental animals during researches of results of commercial cross breeding (table 2.).

Table 2: Biochemical composition of sheep's blood with different breed

Indicators	Unit of measurement	Breed	
		Awx Lh	Lh x Lh
Red cells,	ml.	10,84	12,6
White cells,	thou.	9,46	9,77
Hemoglobin,	g/%	14,7	13,0
Protein,	mg/%	7,59	7,73
Alkaline reserve	mg/%	4,60	4,85
Calcium,	mg/%	7,73	7,67
Phosphorus	mg/%	5,25	6,16

The red blood count of crossbred animals was 10,84 mln. or by 1,76 mln less than in blood of local hair sheep. The content of hemoglobin in crossbreeds Aw x Lh -14,7%, in hair sheep -13,0%, or by 1,7% higher than in crossbreeds. For other indicators there were no substantial differences. Repetition of characteristics. In order to have animals to have high and sustainable productivity during their life, first of all, they must have good adaptability to paratypic living environment. Or in other words the breed to be created or internal breed type shall conform to specific environmental conditions.

In view of the above stated the analysis of results of our researches on age specific repetition of body weight of half-blooded crossbreeds derived from breeding of local hair sheep with Awassi dairy breed is of great interest (table 6).

Table 3: Age specific repetition of body weight of half-blooded ewes (AwxLh)

Age	f
By birth – weaning	0,01
At weaning – 8 months	0,10
At weaning – 12 months	0,21
At weaning – 18 months	0,01

The higher value of repetition of body weight in ewes is obtained at the age of 4 and 12 – months, since this indicator is significantly affected by genetic structure of herd associated with level of stock breeding. Generally in this case the low indicators of repetition in ewes are conditioned by insufficient provision of herd's genetic uniformity and by application of outbreeding of two breeds.

Correlation of characteristics. Without touching a great variety of economic and useful characteristics of sheep, we have studied the nature of relation between the body weight and basic exterior measurement, like shoulder height, height at hips, chest depth, chest breadth, chest girt and cross body length of sheep. Mainly, positive correlation dependencies – from 0,03 to 0,65 were obtained between body weight and basic exterior measurements. Positive relation – 0,10 - 0,12 in crossbreeds between body weight and shoulder height, chest depth, medium positive correlation – 0,24 between body weight and cross body length. The highest degree of dependency 0,65 is between body weight and chest breadth, statistically correct.

IV. Conclusion

As a result of application of crossbreeding by use of genetic resources of local population of hair fat-tailed sheep and Awassi breed, a new genotype of animals was derived which serves as a valuable breeding material in creating new direction of sheep's productivity in Kyrgyzstan – dairy sheep breeding.

The duration of lactation period of the first generation crossbred ewes is longer for 50 days, but milk yielding capacity – 88,7 l more than those of Kyrgyz hair sheep population.

Some low hematologic and clinic-physiological indicators have been identified in crossbred animals in comparison to those of local hair sheep that has to do with undergoing adaptation processes in new genotypes sheep body.

Within the conditions of market relations in order to raise profitability of farmers, farm households, individual owners of animals, it is recommended to diversify the production of new innovative solutions – introduction of elements of dairy sheep breeding.

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