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## Some Exterior-Productivity Indicators Of Rough Coarse Goats Of The Southern Zone Republic Of Tuva.

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### ABSTRACT

The living mass, the parameters of the ex-terrier of different sex-age groups of Tuvan goats, the milk productivity of the goats were studied. It has been established that coarse-wool goats of the southern Tuva zone are outnumbered by some coarse-wooled goats, aboriginal Tuvan goats and goats of the Tuva population of the Soviet wool breed. Young at birth has a high living mass. Sexual dimorphism is well pronounced. By the size and proportions of the body, the goats of the southern zone have very significant differences from the goats of other regions and native Tuvan goats. Tuvian oysters of the southern zone have high milk yield and milk nutrition in comparison with the Tuva population of the Soviet wool breed of goats and provide good growth of live weight of kids in the suckling season.

**Keywords:** coarse-wool goats, live weight, milk production, the chemical composition of milk.

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## INTRODUCTION

In the light of the trends of the world and domestic market, increasing demand for goat products, it is necessary to pay special attention to the development of this industry. At present, there is a growing need for goat products in all countries of the world. In Russia, goat breeding is gaining momentum. The basis of this development was the sectoral target program "Development of sheep breeding and goat breeding in the Russian Federation for 2012-2014. and for the planning period until 2020 "(approved by Order of the Ministry of Agriculture of the Russian Federation of September 2, 2011 No. 294). The demand for goat's milk is increasing, meat production is developing, in which local breeds are of great importance.

The local goats, who were bred for the first time in Tuva, have been involved in the mass identification process since the beginning of the sixties of the last century in order to improve their production qualities. This led to a sharp reduction in their numbers. At present, information on their constitutional, productive and economic-biological characteristics is extremely inadequate.

To conserve and rationally use the gene pool of the Tuvan coarse-wool goat population, in the southern zone of Tuva, the targeted selection is carried out by selecting typical animals according to the main characteristics, the formation of purebred herds.

The aim of the research is to study the productive and biological characteristics of the modern population of Tuvan coarse - wooled goats for developing selection parameters for productivity and conducting full-fledged selection work.

The research tasks are to give a description of the live weight, the ex-terrier of different sex-age groups, the milk productivity of the coarse-wool goat coats of the southern zone of Tuva.

## MATERIALS AND METHODS

The research was carried out in the Sppk-Uurgaj Ehrzinskogo district of the southern zone of Tuva. The object of research was a different age and gender groups of Tuvan coarse-wool goats.

Live weight, body measurements were studied according to the generally accepted method. For the study of milk production, groups of goatskins with goat kids were formed: group 1 of the goat of the first lactation ( $n = 10$ ), group 2 of the goat of the third lactation ( $n = 10$ ) and group 3 of the goat of the fifth lactation ( $n = 10$ ). Animals were in the same conditions of maintenance and feeding. Milk of the goats was determined by the gain of the live weight of kids in the first 20 days of life (A) by calculation according to the formula:  $M = A * 5$ , based on the assumption that 5 kg of mother's milk per 1 kg of gain of live weight of the goat.

Weighed animals were carried out on electronic weighing scales SL-300T with an accuracy of 0.5 kg in adult animals and 0.1 kg in young animals.

The absolute increase in live weight of kids was calculated by the formula:  $A = W_1 - W_0$ .

The chemical composition of milk was studied on an automatic ultrasonic milk analyzer "Laktan - 1 - 4".

Biometric processing of digital data was carried out by the variational statistics method of NA Plokhinsky (1970) using the computer program Microsoft Excel.

## RESULTS AND DISCUSSION

The living mass is an important breeding characteristic characterizing the pedigree characteristics of animals, it has a high correlation with meat production, wool cutting, and its age dynamics gives an idea of the early ripeness of the animal.

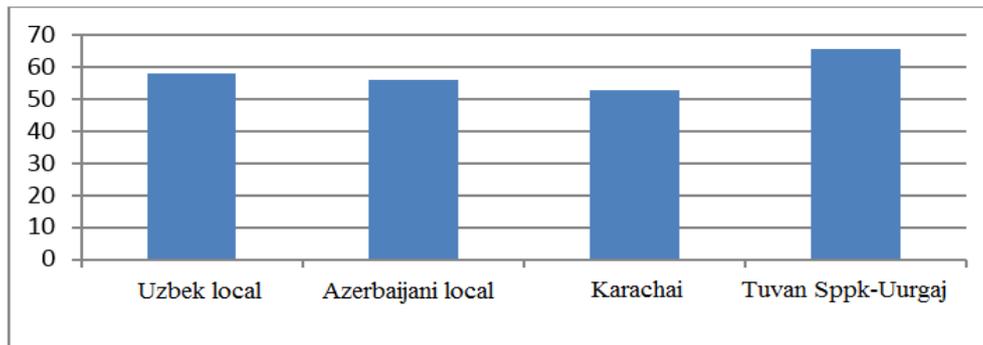
According to the information given by A.I. Chikalev and Yu.A. Yuldashbaev (2012), during the autumn weighing the mass of local coarse-wool goats in Kyrgyzstan to 44 kg, in Turkmenistan - 40-45, in Kazakhstan - 41-45, in Uzbekistan and Tajikistan - 43-45. Live weight of goats is 56-58 kg (up to 65). The average weight of goats in the Chechen and Ingush republics is -31, in Kabardino-Balkaria - 36, in Gorny Altai and Buryatia - 37, in Azerbaijan - 38 kg. The weight of goats is 50-56 kg. In the studies of T.B. Mammoth (2012) modern Aboriginal Karachai goats had a mass: the goats - producers -  $53.0 \pm 3.20$ , the goatskats -  $32.5 \pm 2.10$  kg. In the experiments of A.R. Dolaeva (2009), Karachaevsky 2,5-year-old goatskins weighed 44.0 kg in the first variant of the experiment, 42.0 kg in the second, 41.5 and 39.0 kg in the one-and-a-half-year-olds, the 4-5 selected goats years had a living mass of 80-85 kg.

The goats of the southern zone of Tuva have a fairly high living mass (Table 1).

**Table 1: Live weight of Tuvan goats of the southern zone of Tuva**

Sex and age group	$X \pm m_x$	$C_v$	Lim
Goats-producers	$67,5 \pm 2,30$	5,59	58,0-74,0
Nanny-goat	$49,5 \pm 0,84$	4,16	47,0-53,5
Young goat 1.5 years old	$42,5 \pm 0,47$	8,04	37,3-47,8
Young nanny-goat 1,5 years old	$36,3 \pm 0,19$	6,65	33,2-39,7

From the data given, it follows that coarse-wooled goats of the southern Tuva zone have a relatively high living weight in relation to the majority of the coarse-wooled goats of the CIS countries and Russian regions.



**Figure 1: Live weight of goats-producers of different offspring**

According to Shornikov S.K. (1938), aboriginal Tuvan goats in the summer (June) had a living mass of 31.3 kg. Tuvinian oysters of the southern zone in the same period weigh an average of 43.4, i.e. higher than that of 38.6%, which significantly distinguishes the modern population of goats from the southern zone from Aboriginal people due to this feature.

Compared to the goats of the Tuvan population of the Soviet wool breed, the main breed of goats bred in Tuva, Tuvan coarse-wool goats have higher live weight indices (Table 2).

**Table 2: Live weight of adult goats, kg**

Indicators	Tuvan coarse-wooled		Tuva population of the Soviet wool breed of goats (Irgit R.Sh., Oyun A.B.-C.)	
	Goats-producers	Nanny-goat 3-4 years old	Goats-producers	Nanny-goat 3-4 years old
$X \pm m$	$65,5 \pm 1,7$	$49,5 \pm 0,8$	$58,5 \pm 1,5$	$42,8 \pm 1,4$
Lim	65,0-74,0	47,0-53,5	49,0-66,3	37,2 – 48,4

Young growth of the Tuvan goats has a fairly high living mass (Table 3).

**Table 3: Dynamics of live weight of young animals, kg**

Age, month.	Young goat		Young nanny-goat	
	$X \pm m_x$	$\sigma$	$X \pm m_x$	$\sigma$
New borns	3,1 ± 0,1	0,20	2,9 ± 0,1	0,15
4	17,7 ± 1,2	2,4	15,3 ± 1,3	2,2
12	28,5 ± 0,9	0,72	24,7 ± 0,6	1,83

According to Sambu-Hoo C.S. the goats of the Tuvan population of Soviet wool breed at birth weigh 2.50 kg, goats - 2.27, at 12 months of age, respectively, 24.48 and 23.86 kg.

The age dynamics of the expression of sexual dimorphism is also distinctive. So the difference between goats and goats in young Tuvan coarse-wooled goats at birth was 6.8%, in youngsters of the Tuva population of Soviet wool breed goats - 10.1%, at 12 months age 15.3 and 2.5%, respectively. In young Tuvan coarse-wooled goats, the degree of sexual dimorphism increased 2.5 times with age, and males were significantly superior to females.

Local coarse-wool goats in different regions of distribution differ in body size (Table 4) [2].

**Table 4: Measurements of local coarse-wool goats of different regions, cm**

<u>Area of distribution</u>	<u>Height</u>		<u>Slanting length of trunk</u>
	<u>at the withers</u>	<u>in the sacrum</u>	
<u>Kazakhstan, Uzbekistan, Turkmenistan</u>	<u>64-67</u>	<u>65-69</u>	<u>66-70</u>
<u>Kyrgyzstan, Tajikistan</u>	<u>62-64</u>	<u>64-66</u>	<u>65-67</u>
<u>Northern Caucasus, Transcaucasia</u>	<u>57-60</u>	<u>59-65</u>	<u>63-68</u>
<u>Mountain Altai</u>	<u>61-62</u>	<u>62-63</u>	<u>65-67</u>

Goat measurements of the southern zone have very significant differences from the average data for goats of other regions (Table 5).

**Table 5: Measurements of the goat body in the southern zone, cm**

<u>Sex-age group</u>	<u>Height at withers</u>	<u>Height in sacrum</u>	<u>Slanting length of trunk</u>	<u>Chest circumference</u>	<u>Circumference of the pastern</u>	<u>Depth of chest</u>
<u>Goats-producers</u>	<u>70,7±1,5</u>	<u>72,3±1,1</u>	<u>77,0±2,5</u>	<u>89,7±0,4</u>	<u>11,0±0,0</u>	<u>37,5±1,8</u>
<u>Nanny-goat</u>	<u>63,3±1,4</u>	<u>66,9±1,0</u>	<u>73,5±1,2</u>	<u>85,2±1,0</u>	<u>9,4±0,3</u>	<u>36,4±0,6</u>
<u>One-year-old young goat</u>	<u>59,4±0,9</u>	<u>61,9±1,2</u>	<u>65,6±0,8</u>	<u>69,8±1,9</u>	<u>8,4±0,2</u>	<u>30,8±0,4</u>
<u>One-year-old young nanny-goat</u>	<u>56,6±0,8</u>	<u>59,3±1,6</u>	<u>63,2±1,3</u>	<u>71,1±1,5</u>	<u>8,2±0,2</u>	<u>27,6±2,9</u>

Analyzing the tables 4 and 5 it can be seen that the goats - the producers of this herd by average height in the withers, the height in the sacrum and the oblique length of the trunk exceed the average values of the local coarse-wool goats of the countries and regions cited. In the womb, the measurements of height at the withers and the height in the sacrum are close to the goats of Kyrgyzstan and Tajikistan, but they are larger than the goats of these populations in the oblique length of the trunk.

Characteristics of the sizes and proportions of the body of adult goats of the southern zone are given in Table 6 in comparison with the data of A.V. Rastorgueva and S.K. Shornikov on aboriginal Tuvan goats.

**Table 6: Measurements of adult goats, cm**

Indicators	Tuvinian southern zone		Tuva aboriginal		
			By A.V. Rastorguevu, 1934		By S.K. Shornikov, 1939
	Goats-producers	Nanny-goat	Goats-producers	Nanny-goat	Nanny-goat
Height at withers	70,7±1,2	64,1±1,3	68,7 ± 0,9	64.3 ±0.2	59,47±0,29
Slanting length of bodies	77,0±2,5	73,5 ±1,2	77,9±1,66	65.9±0,27	61,41±0,37
Breast width	22,0±1,2	18,5±0,6	17,4±0,32	16,3±0,26	-
Depth of chest	37,5±1,5	36,4±0,5	29,3±0,52	28,7±0,16	-
Chest circumference	89,7±0,4	85,2±0,7	81.6±1,15	76.9±0,32	71,10±0,74
Circumferenceofthepastern	11,0±0,1	9,3±0,2	8,9±0,10	7,9±0,04	-

According to this feature, the Tuvan goats of the southern zone have noticeable differences from Aboriginal Tuvan. As can be seen from the data given, a significant difference is observed in the measurement of the chest. The chest of the goats of the southern zone is wider, deeper and has a larger diameter. So, the measurement of the width of the chest for goats-makers is more by 26.4%, for goats - by 13.5, for chest depths - by 28.0 and 30.0, for chest girth - by 20.9 and 12.6%, respectively. As a result, the proportions of the physique have changed in the modern population, which is reflected in the body build indices (Table 7).

**Table 7: Body building indexes for adult goats,%**

Indicators	Tuvinian down type		Tuva aboriginal		
			By A.V. Rastorguevu, 1934		By A.V. Rastorguevu, 1934
	Goats-producers	Nanny-goat	Goats-producers	Nanny-goat	Nanny-goat
Stretch	108,9±0,8	114,6±2,0	113,43	102,58	103,26
Mobility	116,4±1,8	115,9±1,6	104,77	116,60	115,78
Thoracic	58,7±1,5	49,6±1,2	58,8	56,8	-
Bone	15,5±0,2	14,7±0,4	12,96	12,25	-
Longness	46,9±1,5	41,6±0,7	57,32	55,40	-

The Tuva goats of the southern zone, compared to the aboriginal, are more squat, knocked down, the index of bone, reflecting the fortress of the skeleton is higher.

Peculiarities of the body size of young animals are characterized by the measurement values given in Table 8.

**Table 8: Measurements of the youngsters of the Tuvan goats of the southern zone, cm**

Indicators	Age, month					
	6		12		18	
	Young goat	Young nanny-goat	Young goat	Young nanny-goat	Young goat	Young nanny-goat
Height at withers	56,3±0,78	53,6±0,29	59,4±0,86	56,6±0,81	64,10±0,41	61,9±0,72
Height in sacrum	58,8±0,27	57,9±0,78	61,9±1,15	59,3±1,58	66,5±0,52	63,6±0,72

Slanting length of trunk	62,1±0,36	61,8±0,52	65,6±0,83	63,2±1,26	73,20±0,81	70,20±0,9
Breast width	16,5±1,20	15,1±2,01	17,3±0,90	15,8±0,81	19,1±0,90	17,3±0,72
Depth of chest	30,3±0,28	27,6±0,42	30,8±0,31	27,9±2,90	31,9±0,31	30,5±0,85
Chest circumference	69,8±0,61	69,2±0,9	70,0±1,96	71,1±1,47	82,8±1,77	79,20±0,79
Circumference of the pastern	8,7±0,15	8,4±0,23	8,4±0,17	8,2±0,17	9,4±0,19	9,0±0,17

The size of the height measurement at the withers of 18-month-old goats approaches the value of this measurement in adult queens and is 96.6% of it, which allows us to indirectly judge the degree of development of their linear parameters at the age of the first mating.

The data on the increase in linear parameters given in Table 9 shows the ability of the youngsters of the Tuvan goats of the southern zone to restore their growth rate in a favorable summer-autumn pasture period (from 12 to 18 months) after the winter-spring unfavorable climatic and food period 6 to 12 months of age).

**Table 9: Young growth measurements**

Indicators	Absolute, cm		Relative, %	
	Young goat	Young nanny-goat	Young goat	Young nanny-goat
	from 6 to 12 months			
Height at withers	3,1	2,9	105,5	105,2
Height in sacrum	3,2	2,3	105,5	104,1
Slanting length of trunk	3,2	1,7	105,1	102,7
Breast width	0,8	0,7	104,8	104,6
Depth of chest	0,8	0,3	102,6	101,0
Chest circumference	2,1	1,9	103,0	102,7
Circumference of the pastern	0,2	0,2	102,2	102,4
from 12 to 18 months				
Height at withers	4,7	7,2	107,9	107,3
Height in sacrum	2,0	7,9	103,2	109,6
Slanting length of trunk	7,6	8,7	111,5	111,0
Breast width	2,3	2,7	113,2	109,5
Depth of chest	1,7	1,6	105,5	104,6
Chest circumference	10,9	10	115,1	111,3
Circumference of the pastern	0,5	0,5	105,6	103,6

During the period from 6 to 18 months of age, the largest linear increase was noted in measurements of depth and girth of the chest, oblique length of the trunk. These measurements increased by an average of 22.0; 18.5; 16.0% respectively.

The proportions of the bodies of the youngsters of the Tuvan goats of the southern zone and their age-related changes are illustrated in Table 10.

**Table 10: Indexes of the physique of young animals, %**

Indicators	Age, month.					
	6		12		18	
	Young goat	Young nanny-goat	Young goat	Young nanny-goat	Young goat	Young nanny-goat
Stretch	114,3±0,9	115,3±1,0	112,4±0,9	113,7±0,7	112,2±0,7	113,4±0,6

Mobility	112,4±1,1	112,0±1,0	112,7±1,5	112,5±0,4	113,1±2,1	112,8±0,8
Thoracic	54,5±1,1	51,5±0,9	56,2±0,7	56,6±0,8	59,9±1,1	56,7±0,8
Bone	15,5±0,2	15,7±0,2	14,4±0,2	14,5±0,3	14,7±0,3	14,5±0,1
Pereroslosti	104,4±0,5	105,0±0,4	104,2±0,2	104,8±0,2	103,7±0,2	102,8±0,3
Longness	46,2±0,6	45,3±1,2	48,2±0,8	49,7±0,5	50,2±0,6	50,7±1,4

As can be seen from the data presented, by the age of 18 months, the indices of longness and bone indexes decreased, the indices of confusion and thoracic indices increased. The proportions of the measurements indicate the compactness of the body of the young.

When breeding goats, it is important to consider milk production. The uterus, which has a high milk content, ensures the best growth and development of kids in the suckling season. The study of the milkiness of goats is of great importance for the improvement of the herd. Selection of high-milk uterus allows producing more products by obtaining strong young, resistant to negative factors of the environment, which has high growth of live weight.

In the conditions of Tuva with year-round pasture maintenance of animals, one of the problems is the preservation and cultivation of strong young animals. The growth of kids in the milking period depends on the nutrition of mothers milk. The main indicators of the quality of milk are the content of fat, protein, dry milk residue. In this regard, the study of milk and milk quality of the goat milk in connection with their age and the full value of ensuring the growth and development of kids is of great importance.

As the results of our studies show, Tuvan coarse-wooled goats in the southern zone have a sufficiently high milk yield and provide high-nutritional milk, which provides good weight gain for kids in the suckling period (Tables 11 and 12).

**Table 11: Goat milk**

Indicators	Group		
	1	2	3
Live weight of a kid at birth, kg	3,1±0,97	3,3±0,51	3,1±0,28
Live weight of a goat at the age of 20 days, kg	6,1±0,45	6,9±0,74	6,4±0,13
Absolute growth of live weight for 20 days, kg	3,0±0,33	3,6±0,21	3,3±0,42
The average daily gain of live weight, kg	0,150	0,180	0,165
Milk for 20 days of lactation, kg	15,0	18,0	16,5

**Table 12: Chemical composition of milk, (%)**

Indicators	Group		
	1	2	3
Fat	7,2	7,9	8,1
Protein	4,1	4,4	3,9
SOMO	11,5	12,1	11,3

According to the data of Sambu-Khoo C.S., Dvalishvili V.G. the milkiness of the Tuvanian goats of the Soviet wool breed of goats for 20 days of lactation is 13.45-14.85 kg. The fat content in milk was in the range of 3.12-4.25, protein - 3.04-3.14. Thus, the coarse-wool goats of the southern zone exceed the goats of the Soviet wool breed in terms of the milk's milk content and nutritional status. Note that milk and chemical composition of milk of Tuvan coarse-wooled goats has a certain relationship with age, as evidenced by the data given above.

The ratio of fat to protein in the studied kozomatok was: group 1 - 1.75, group 2 - 1.80, group 3 - 2.07, which is generally a fairly high index for coarse-wooled goats. So, for example, in Armenian goats average values of this indicator range from 1.28 to 1.91.

Thus, coarse-wool goats of the southern zone of Tuva are distinguished by their characteristic features of the living mass, the ex-terrier, milk productivity, which determines their originality, requires conservation and reproduction, rational use of their gene pool.

### CONCLUSION

1. Coarse-wooled goats of the southern Tuva zone are better than some offspring of coarse-wooled goats, aboriginal Tuvan goats, and goats of the Tuva population of the Soviet wool breed, which are bred in the republic. Young at birth has a high living mass. Sexual dimorphism is well pronounced.

2. By the size and proportions of the body, the goats of the southern zone have very significant differences from the goats of other regions and native Tuvan goats.

3. Tuvian owls of the southern zone have high milk yield and milk nutrition in comparison with the Tuva population of the Soviet wool breed of goats and provide good growths in the live weight of kids in the suckling season.

### REFERENCES

- [1] IrgitR. Sh., Ojun A.B.-S., Oorzhak D. D. Sravnitel'naja otsenka kozplemreproduktora GUP «`Ejlig – Hem» Ulug –Hemskogokozhuuna Respubliki Tyva po osnovnym selektsionnym priznakam. Vestnik Tuv GU. 2014. 2. 130-135
- [2] Marmarjan G. Ju., Markarjan G.S. Molochnaja produktivnost' i fiziko-himicheskie svojstva moloka mestnyh koz Armenii //Bologich. Zhurnal Armenii, 2013. 3(65). 107-111
- [3] Novopashina S.I. Sozdanie plemennoj bazy i sovershenstvovanie tehnologicheskikh priemov v molochnom kozovodstve: Avtoref. dis. d-ra s.-h. nauk 06.02.07. Stavropol', 2013. 45
- [4] Rastorguev, A.V. Tuvinskaja koza i kachestvo ee sherstnogo pokrova. Trudy Tuvinskoj `ekspeditsii Akademii naukim. Lenina. Fond 59, opis' № 1, ed. hr. 1. 1935. 1-42
- [5] Sambu-Hoo Ch.S., Dvalishvili V.G. Molochnaja produktivnost' i svojstva moloka koz tuvinskoj populjatsii sovetskoj sherstnoj porody. Ovtisy, kozy, sherstjanoe delo, 2014. 33-35
- [6] Sambu-Hoo Ch.S. Produktivnye i biologicheskie osobennosti koz raznogo proishozhdenija v uslovijah Respubliki Tyva: Avtoref. dis.kand. s.-h. nauk 06.02.10. Dubrovitsy, Moskovskoj oblasti, 2016. 16
- [7] Chikalev A.I., Juldashbaev Ju.A. Kozovodstvo: Uchebnik. M.: G`EOTAR Media, 2012. 131-132
- [8] Shornikov S.K. Produktivnost' tuvinskih koz. Trudy Tuvinskoj sel'skohozjajstvennoj opytnoj stantsii. Vyp. 1. Kyzyl, 1939. 60-73