

## Norduz Goat of East Anatolia

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**Abstract:** Norduz goat is a breed of East-Anatolia localised in Gurpinar district of the province Van. There is neither research work nor documented information concerning this breed in Turkey. Although its origin is uncertain, Norduz goat is well known and distinguishable by breeders of Norduz Area. Main characteristics of Norduz goat are the favorable preweaning viability, the relatively high twinning rate and the milk production level as compared to other breeds of the region. The males have robust, long and upward horns. The females are seldom polled. Average adult body weight of females is 48 kg. Average weights at birth and weaning are respectively 2.7 and 18.4 kg for females, 3 and 21.1 kg for males; 3 and 20 kg for single born, 2.8 and 19.2 kg for twin born kids. Twinning rate is about to 30%. The principle colour of Norduz goat is black. Also, white, black-white, grey, roan and brown colour can be found. The average milk production in one lactation is not known. The basic product is milk which is used for cheese and butter production. The hair obtained from Norduz goat is a subsidiary product for producing regional and traditional goods, such as blankets, gloves and caps. There is a progressive decrease in the population of this goat, basically related to the decrease of the number of breeders, due to emigration to cities. Some animal diseases, especially abortus can appear frequently in Norduz area.

**Key words:** Norduz goat, East-Anatolia, Body Measurement, Turkey

### Introduction

Hair goat represents the largest part of total goat population in Turkey of almost 7 022 000 head (Anonymous 2002). Generally, rocky, mountainous and near wooded area which are unsuitable for cattle or sheep may be considered for hair goat rearing in the Eastern part of Anatolia. In Norduz area situated in the province Van of East-Anatolian Norduz goat is characteristically different from other hair goat breeds in the region.. There is no documented information on the Norduz goat. In this article, some characteristics and breeding conditions of Norduz goat are investigated.

### Materials and Methods

**Origin and Distribution:** Although no registered information on Norduz goat and its origin is available, there is a belief that this breed has been brought to Norduz area from Northern Iraq 250-300 years ago. Norduz goats are actually distributed onto 23 villages in Norduz area which is part of Gürpınar district situated between 38.2 °N latitude and 43. 25°E longitude, 1745 m above sea level in Van (Anonymous, 2003). There are 2-10 arable fields in each village.

**Morphological characteristics:** The main color of Norduz goat is black but white, cream, black-white, grey, ash, roan, brown and milky coffee colored animals may also be found. Males have robust, long and upward horns. They are gently curved to both side and back. Females are seldom polled. In females, horns are thinner relative to those in males. Sometimes horns are curved downward in spherical form.

**Flock management, mating and housing:** Some body measurement were taken on 99 Norduz goats bred in Kirgecit, Karakas and Yolacan villages of Gurpinar district. The goats were randomly chosen from farmers' flocks kept in these villages. Data concerning age records of goats, birth type and weight at birth, first, second, third months and at weaning of kids were obtained from farmers' flock kept in above mentioned villages. Norduz goats are kept under traditional breeding and feeding conditions of villages, without receiving any special treatment. The goats are naturally mated and kids were weighed at birth, first, second, third month and weaning. Young bucks and does are not used for mating before 1.5 year-old. Bucks are introduced into the flock toward to the end of October and then kept in the flock until July and August of the following year. Females are assessed by breeders according to their body condition before mating. The season of mating occurs between the end of October and the beginning of December.

The goats are sometimes grazed by family members of herd owners. The pens are mostly primitive in Norduz area. The pens are usually built of sun-dried brick made by family, and stone or coal briquette. The roof is covered with bushes or a heap of straw-and soil mixture. There are windows and aeration opening in the buildings.

Table 1: Mean live weight of Norduz kids at birth, first, second and third month of age and weaning with regard to gender and birth type use decimal points not commas

	Female	Male	Single	Twin
Birth	2,71 <sup>a</sup> ± 0,080 (51)	3,01 <sup>a</sup> ± 0,059 (56)	2,98 <sup>a</sup> ± 0,080 (41)	2,80 <sup>a</sup> ± 0,059 (66)
1 <sup>st</sup> month	8,9 <sup>b</sup> ± 0,367 (34)	9,1 <sup>b</sup> ± 0,224 (27)	9,5 <sup>b</sup> ± 0,367 (24)	8,4 <sup>b</sup> ± 0,224 (37)
2 <sup>nd</sup> month	10,2 <sup>c</sup> ± 0,569 (34)	10,9 <sup>c</sup> ± 0,312 (27)	11,4 <sup>c</sup> ± 0,569 (24)	9,9 <sup>c</sup> ± 0,312 (37)
3 <sup>rd</sup> month	14,0 <sup>d</sup> ± 0,646 (34)	15,9 <sup>d</sup> ± 0,442 (27)	15,7 <sup>d</sup> ± 0,646 (24)	14,2 <sup>d</sup> ± 0,442 (37)
Weaning	18,4 <sup>e</sup> ± 0,835 (34)	21,1 <sup>e</sup> ± 0,558 (27)	20,0 <sup>e</sup> ± 0,835 (22)	19,2 <sup>e</sup> ± 0,558 (36)

1. Values with the different superscript are significantly different from each others ( $P < 0,01$ )

2. Number of observations are shown in brackets

Table 2: Average biometric measurement of Norduz goats kept in different villages

Trât	Villages	N	Mean	SE Mean	Min	Max
Age	1*	28	4.86	0.340	2.00	8.00
	2**	16	2.75	0.237	1.00	4.00
	3***	55	3.17	0.157	1.50	6.00
Live Body Weight	1	28	55.73 a	1.320	44.50	68.00
	2	16	49.84 b	1.250	42.00	59.00
	3	55	43.67 c	0.947	28.00	58.00
Body Length	1	28	69.57 a	0.564	65.00	77.00
	2	16	69.56 a	0.591	66.00	74.00
	3	55	66.06 b	0.458	55.00	72.00
Height at Withers	1	28	66.79 a	0.571	62.00	73.00
	2	16	65.25 ab	0.559	60.00	69.00
	3	55	63.86 b	0.435	56.00	71.00
Chest Width	1	28	22.54 a	0.339	20.00	27.00
	2	16	22.25 a	0.371	20.00	24.00
	3	55	18.82 b	0.270	15.00	24.00
Ridge Height	1	28	64.71 a	0.514	60.00	70.00
	2	16	64.13 a	0.482	61.00	69.00
	3	55	61.95 b	0.421	55.00	70.00
Rump Height	1	28	66.46 a	0.495	62.00	72.00
	2	16	66.19 a	0.458	63.00	71.00
	3	55	62.96 b	0.434	54.00	69.00
Chest Girth	1	28	88.61 a	0.846	80.00	96.00
	2	16	86.20 a	1.180	80.00	96.00
	3	55	79.82 b	0.750	67.00	91.00
Chest Depth	1	28	32.86 a	0.448	30.00	39.00
	2	16	31.88 a	0.407	30.00	35.00
	3	55	28.31 b	0.348	21.00	35.00
Hind Leg	1	28	55.36	1.160	44.00	68.00
Circumference	2	16	52.88	1.400	40.00	61.00
	3	55	55.16	0.798	40.00	68.00

\* Karakas

Values with the different superscript are significantly different from each others ( $P < 0,01$ )

\*\* Kirgecit

\*\*\* Yolacan

**Feeding:** Norduz goats are fed entirely by grazing in pastures near villages and arable fields in spring and summer time without additional feeding. During cold and snowy period of winter, hay and cereal straw are given to goats housed in covered pens. Apart from few, breeders usually do not give additional concentrate mixture to goats, because of insufficient income. However, in case of additional feeding, it is usually barley produced on farm

**Kidding:** Kidding period starts from the end of February to March. When adequate level of feeding is provided during breeding and gestation period, it is possible to obtain a twinning rate almost 50%. The kids are weaned after 2.5-3 months of suckling period. Colostrum is not given to new born kids, because of a wide spread habit of Norduz goat breeders. It is believed that colostrum can be harmful with its diarrheic effect.



Fig. 1: Female Norduz Goat

The live weight of goats and kids were taken by using a 50 g accuracy balance. Body length, height at withers, rump and ridge height, chest width and depth were measured with a surveyor's stick. Hind leg circumference and chest girth were taken by using a measuring tape. Data was analyzed by Minitab (1993). The effect of birth type and gender on the live weight of kids was investigated by analysis of variance. This was applied considering the periods of growth as repeated measurement. Duncan's Multiple Range Test was used for testing differences between groups. The correlation between maternal live weight and those of kids at different stage of growth are also investigated. The age is considered as a co-variable. Thus, data concerning body measurement characteristics are corrected according to age factor for achieving a reliable comparison.

## Results

Average twinning rate was 30% which herd. Neither birth type, nor kid gender has a significant effect on the weight at birth, first, second, third month and weaning. Average live weights of kids with regard to gender and birth type are shown in Table 1. The weight of kids at birth and those at first, second and third month, except the weight at weaning were significantly correlated with maternal weight ( $P < 0,05$ ). The age of goats varies between 1 and 8 years. Average flock age is 3,6 (43 month). Although average weight of male kids was higher than these of female kids and also these of single born was higher than these of twin born kids from birth till weaning, the difference was not significant. Some body measurement obtained from Norduz goat shown in table 2. Some significant differences ( $P < 0,01$ ) are observed between goats bred in different villages with regard to body measurement, except the hind leg circumference. It can be concluded that Norduz goat breeds from the farm of Yolacan village have smaller body shape than these of Karakas and Kirgecit villages.

## Discussion

Main products of Norduz goat are milk, meat and hair. Norduz goat is known for its high dairy production in the area. The milk is usually processed into the cheese. The herby cheese is a famous traditional product of Van provincial, produced by mixing sheep and goat milk. There is no type of cheese produced entirely from goat milk in the area. Apart from cheese, butter is also produced from goat milk.

Norduz goat is appreciated by goat breeders either for its high weaning viability and body growth. Male kids are kept in the flock either to provide meat for auto-consumption or to sell them live when additional revenue is needed. The goat's hair is also a subsidiary product which was appreciated recently, although it is out of favor now. The down fiber is collected usually in February and used for kashmir production. There are special products obtained from the down fiber, such as blankets, gloves and socks in Norduz Area. The upper hair is used for making felt tent.

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