

PJN

ISSN 1680-5194

PAKISTAN JOURNAL OF
NUTRITION

ANSI*net*

308 Lasani Town, Sargodha Road, Faisalabad - Pakistan
Mob: +92 300 3008585, Fax: +92 41 8815544
E-mail: editorpjn@gmail.com

Study on Cashmere Quality and Hair Percentage of Black Goat of Southern Khorasan for Stable Development of Agriculture

D.A. Saghi, S.A. Shiri and M. Nikbakhti

Agriculture and Natural Resources Research Center of Khorasan, Mashhad, P.O. Box 91735-1148, Iran

Abstract: Economic importance of good quality cashmere including, raw cashmere export or utilization for using in internal alternative industrial and saving foreign currency arising from cashmere import break and importance of agriculture in security of economical of country and to pay attention to pastures in ecosystem stability, performance of animal breeding programs is essential to reach higher animals. The black goat of southern Khorasan maintaining in Ghayen, Birjand, Sarbisheh and Nehbandan is about 2 million head. Dispersion of this population was increasing than south regions to Afghanistan border and color of protector hair of these goats and cashmere color, changing from bright brown to dark brown. The goats were selected in form of random from the goat growing regions. Samples were taken at goat's side for measurement hair percentage and fiber's length and diameter. Results indicated that highest and lowest fibers length were observed in Nehbandan (68.34_{mm}) and Birjand (49.65_{mm}), whereas highest and lowest fiber diameter were found in Sarbisheh (18.81 μ) and Birjand (16.49 μ) and highest and lowest percentage of hair covering were found in Ghayen (56.66%) and Sarbisheh (43.10%), respectively. In this study mean of fiber's length, fiber's diameter and hair covering percentage were 52.71_{mm}, 17.10 μ and 54.73%, respectively.

Key words: Goat, cashmere, hair, Khorasan

Introduction

Having high economic value of high quality cashmere including crude cashmere exports its application domestic added value industry and regarding the value of agriculture sector in political and economical independence of the country in addition to having range of lands as most vital bed for sustainable development of environment implementation of animal breeding program to achieve highest performance animals is of major importance. Southern Khorasan region including Nehbandan, Birjand, Ferdos, Ghayenat and Gonabad cities with mean rainfall of 80-100_{mm} annual having dry and semi dry ecological condition and this unfavorable climate cause this region to have petty plant covering. On the other hand, this place contains beachy and salt marsh (32%) and pastures capable of exploitation (45.1%) (Khorasan Provincial Management Organization, 1992). In this region 3.7 million domesticated animal unite exist, that include 19.4% of total animal unite populations of Khorasan (Book of Khorasan Statistic, 1998). Approximately 90% of the world's goats dispersed in Asia and Africa and about 3.8% the world's goats raise in Iran and goats have include 13.7% of animal unite populations of Khorasan that 44% of them dispersed in southern Khorasan [Iran National Front (Animal Husbandry), 1998]. Altogether, goats are breed for milk production in Europe but in equatorial regions goats were breed for meat production due to excessive walking and migration. In numerous countries, goats were breed for fiber (cashmere). Chemical and mechanical properties have main role for

protection of fiber (Rashidi, 1998). With microscopic observation in goat's skin, two kinds of fiber producer follicle can be seen that known as primary/secondary follicles. Primary follicles has sebaceous cwa gland, sweat gland and arrectermascle and produce rough and thick fibers, while secondary follicles has miss sebaceous cwa, sweat gland and arrectermacle and produce soft and fair fibers (Sumner and Bigham, 1991). Goats causing their covering fibers are divided in to two groups: one of them is one covering and another is twice covering that fibers in one covering goats known as hair with (25-40 μ) delicacy and (120-160_{mm}) length (William *et al.*, 1999). Twice covering goats produce two kinds of fibers that contain lower fibers cashmere with (16-18 μ) delicacy and (30_{mm}) length and upper fibers (hair), those goats known as cashmere goat (Bioshop, 1998; Bioshop and Russl, 1994). Southern Khorasan goat with about 2 million head population is kind of twice covering goat and their protectoring hair is black and color of cashmere is changeable from bright brown to dark brown. Economic value of cashmere is depending on fibers diameter and length. In these days one kilogram pure cashmere value in global markets fluctuates between 75-150 dollar. As a result and as mentioned quality, Iranian cashmere has the lowest price, while with breeding programs specification cashmere of Iranian goats will be meet global standard. Therefore, the objective of the present study is to analyze the quality of produced cashmere in environmental condition of southern Khorasan and effective factors on quality and quantity of this region product.

Saghi *et al.*: Study on Cashmere Quality and Hair Percentage of Black goat

Table 1: Hair percentage, fiber's length (mm) and fiber's diameter (μ)

	Fiber data			Hair data
	n	Diameter (μ)	Length (mm)	Percentage (%)
Location				
Birjand	112	16.49±1.21	49.58±10.98	56.67±10.49
Ghayen	55	17.50±1.29	50.81±12.87	59.67±12.79
Nehbandan	22	17.50±1.27	68.34±7.90	44.26±6.39
Sarbisheh	22	18.81±1.28	57.37±13.91	43.06±10.57
Sex				
Male	40	17.59±1.39	57.12±15.07	53.39±14.89
Female	171	16.97±1.44	51.63±12.13	55.02±11.55
Age of dam (Year)				
1	47	16.41±1.28	48.64±15.22	54.44±15.04
2	58	17.05±1.28	57.63±10.68	50.72±9.79
3	47	17.79±1.66	56.20±13.11	54.79±12.23
4	32	17.31±1.30	49.89±10.38	59.80±10.16
5	24	17.01±1.34	45.48±8.38	57.97±11.99
6	3	16.53±0.97	51.76±16.72	56.43±8.96
Total	211			
Mean		17.10±1.44	52.67±12.88	54.74±12.23

Materials and Methods

Two hundred and eleven goats were selected randomly from growing places in southern Khorasan contain Nehbandan, Sarbisheh, Birjand and Ghayen. Cashmere was sampled from right side of goats (Taddeo *et al.*, 2000). Samples sent to Cashmere Iran Laboratory in Mashhad for measuring hair percentage, diameter and length cashmere fibers.

Linear model used for analysis of result according to the following

expression:

$$y_{ijkl} = \mu + c_i + h_j + s_k + ag_l + e_{ijkl}$$

y_{ijkl} : is an observation on each trait

μ : population mean

c_i : breeding place (city) fixed effect $i = 1, \dots, 4$

h_j : herd fixed effect $j = 1, \dots, 7$

s_k : sex fixed effect $k = 1, 2$

ag_l : age of animal fixed effect $l = 1, \dots, 6$

e_{ijkl} : random error

For data analysis used than Version 7 of SAS Software.

Results and Discussion

Results of hair percentage, diameter and length of cashmere fibers are shown in Table 1. This study showed that effects due to breeding place (city) on hair percentage, diameter and length of fibers was significant. Highest and lowest values of hair percentage were in Birjand and Sarbisheh, respectively. While mean hair percentage between Nehbandan and Sarbisheh don't had significant difference, but fiber's length and diameter between these townships were significant ($P = 0.05$). Herd effect on hair percentage was significant and the highest fiber's length by high thickness was in male samples. The result of this study was consistent with result of another researcher (Litherland *et al.*, 2000;

Taddeo *et al.*, 2000; Zhou *et al.*, 2003).The effect of animal age on hair percentage was significant while on fiber's length and diameter were not.

References

Bioshop, S.C., 1998. Strain comparisons and genetic parameters for cashmere goats, Proceeding of 5th world congress on genetics applied to livestock production, 19: 401-405.

Bioshop, S.C. and A.J.F. Russl, 1994. Cashmere production from feral and imported cashmere goat kids, Anim. Product., 58: 135-144.

Book of Khorasan Statistic, 1998. Khorasan provincial management organization.

Iran National Front (Animal husbandry), 1998. management organization. Vol, 10.

Khorasan Provincial Management Organization, 1992. Southern Khorasan development plan. Vol, 5.

Litherland, A.J., C. Toerien, T. Sahlu, P. Lee and A.L. Goetsch, 2000. Effects of season on fleece traits of Angora does in the US. Small Ruminant Res., 38: 63-70.

Rashidi, A., 1998. Genetic assessment of economical traits in Marghoz goat. Ph.D. Theses. Tarbiat Modares University.

Sumner, R.M.W. and M.L. Bigham, 1991. Biology growth and possible genetic and non genetics means influencing fiber growth in sheep and goat. Livestock Product. Sci., 33: 1-29.

Taddeo, H.R., L. Duga., D. Almeida., P. Willems and R. Somlo, 2000. Variation of mohair quality over the body in angora goats, Small Ruminant Res., 36: 285-291.

William, J., A. Payne and R. Trevor Wilson, 1999. An introduction to animal husbandry in tropics, book.

Zhou, H.M., D. Allain, J.Q. Li, W.G. Zhang and X.C. Yu, 2003. Effects of non genetics factors on production traits of Inner Mongolia cashmere goats in China. Small Ruminant Res., 47: 85-89.