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Wool characteristics of poonchi sheep

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Abstract

A total of 168 wool samples of Poonchi sheep of both sexes were collected randomly and analyzed for different wool production traits at Fleece testing laboratory, Kartholi, Jammu. The wool traits included in the present study were crimps per inch (CPI), staple length (SL) (cm), clean wool yield (CWY) (%), fibre diameter (FD) (μ), medullation (M) (%), wool count (WC) (no.) and range in diameter (RD) (μ). Wool colour in Poonchi sheep was white, black and different shades of black and white. The overall averages for CPI, SL, CWY, FD, M, WC and RD lower & RD upper were 8.67 ± 0.18 , 3.82 ± 0.07 cm, $63.14 \pm 0.23\%$, $24.99 \pm 0.13 \mu$, $2.22 \pm 0.19\%$, 58.13 ± 0.17 nos and 11.75 ± 0.07 & 39.74 ± 0.31 , respectively. The Co-efficient of variations (CV) for all the traits under study was very low to medium. The highest CV (%) was obtained for medullation. The correlation values ranges from -0.691 between FD and WC to 0.654 between CPI and M. The values of analysis of wool parameters suggested that wool of Poonchi sheep is of moderate fine type.

Keywords: Fibre diameter, staple length, Poonchi sheep, correlation, wool traits

Introduction

Poonchi is an indigenous sheep breed of Jammu & Kashmir state. The breeding tract of Poonchi sheep is mainly Poonch district and adjacent districts Rajouri and Reasi of Jammu province. Poonchi sheep is locally known as Pahari and Desi sheep and mainly reared by nomadic community of Jammu & Kashmir districts namely Gujjar, Bakerwals and Pahari. Poonchi sheep is maintained by the farmers without any scientific management and breeding practices on depleted pasture. The sheep is mainly reared by the people for mutton and wool production. This sheep population is migratory in nature. Poonchi sheep is small to medium in sized with white, black and different shades of white and black body colour. Shearing is mainly performed only once before migration to highland pasture. Very scanty information is available regarding the wool characteristics of this sheep breed. The present study will be helpful to formulate the breeding strategies and conservation strategies of this breed. Therefore, the present study was under taken to evaluate the wool characteristics of Poonchi sheep in the home tract under the network project.

Materials and Methods

A total of 168 wool samples of Poonchi sheep irrespective of sex were collected from different villages of Poonch, Rajouri and Reasi districts randomly. The wool samples were packed properly and brought to Fleece testing laboratory, Kartholi, Jammu, for further analysis. The wool traits included in the present study were crimps per inch (CPI), staple length (SL) (cm), clean wool yield (CWY) (%), fibre diameter (FD) (μ), medullation (M) (%), wool count (WC) (no.) and range in diameter (RD) (μ). The wool colour of obtained by visualising the colour of wool in day light.

The mean, standard error, standard deviation, coefficient of variation and correlation coefficient for different wool production traits were computed ^[1]. The standard error of phenotypic correlation was computed by the formula given below

$$S.E. (r_p) = \sqrt{[(1 - r_p^2) / (N-2)]}$$

Where,

r_p = phenotypic correlation

N = number of observations

Results and Discussion

A total of 168 wool samples of Poonchi sheep were studied to evaluate wool characteristics of Poonchi sheep. Wool colour in Poonchi sheep was white, black and different sheds of black and white.

The means, range and CV of results of CPI, SL, CWY, FD, M, WC and RD have been presented on Table 1. The overall means for CPI, SL, CWY, FD, M, WC and RD lower & RD upper were 8.67 ± 0.18 , 3.82 ± 0.07 cm, $63.14 \pm 0.23\%$, $24.99 \pm 0.13 \mu$, $2.22 \pm 0.19\%$, 58.13 ± 0.17 nos and 11.75 ± 0.07 & 39.74 ± 0.31 , respectively.

Out of 168 wool samples tested, in 45 wool samples there were no crimps. The range of crimps varied from 6.00 to 14.00 with moderate CV (22.96%). Similar range and mean value was reported in Poonchi sheep [2]. However, in Hamadani sheep, in Pugal sheep, in different breeds in Bangladesh and in Purky sheep estimated lower crimps per inch [3-6].

The range of staple length of Poonchi sheep was 1.5 to 5.5 cm with an average 3.82 ± 0.07 cm. Similar value was reported in Poonchi sheep [2]. Higher values for staple length were reported in Bharat Merino sheep, in Hamadani sheep, in Pugal sheep, in different breeds in Bangladesh and in Purky sheep [7, 3-6]. The moderate CV (25.24%) indicates moderate variability of the trait in Poonchi sheep population. The results showed that the average staple length of Poonchi sheep was in a range of local to $\frac{1}{2}$ crossbred sheep of Jammu & Kashmir state as mentioned by fleece testing office, Jammu.

CWY was expressed in percent. The clean wool yield varied with a range of 54.16 to 70.73% with an average value $63.14 \pm 0.23\%$. Similar CWY value was reported in Poonchi sheep [2]. The lower value for CWY was reported in Purky sheep [6]. Very low co-efficient of variation (4.72%) of CWY in the present study indicates that there is low variability of the traits and can only be improved by selective breeding.

The fibre diameter of processed fibre ranged from 21.05μ to 32.82μ with an average $24.99 \pm 0.13 \mu$. The range of fibre diameter presented on table indicates that the Poonchi sheep have higher diameter than that of other breeds found in Jammu and Kashmir. The result is in the same agreement as reported in FAO [8]. Similar mean FD value was reported in Poonchi sheep [2]. Higher estimates of FD were reported in

Hamadani sheep, in Pugal breed and) in Purky sheep [3,4,6]. The low co-efficient of variation (6.52%) indicates that the variability of FD in Poonchi sheep is low, so selection on the basis of collateral and better management practices can improve the trait.

The medullation of 37 samples were observed from total of 168 wool samples of Poonchi sheep and the average medullation was found to be $58.13 \pm 0.17\%$. The coefficient of variation was high (51.35%) for medullation. Similar mean medullation value with lower CV (22.33%) was reported in Poonchi sheep [2]. In Pugal sheep and in Purky sheep higher medullation percentage was reported [4,6].

The wool count is expressed in percent. The wool count of wool sample collected ranged from 48.00 to 64.00 and the average of wool count was 58.13 ± 0.17 . The co-efficient of variation for wool count was low (3.73%). It indicates that the variability of wool count in Poonchi sheep is very low. Similar mean WC value was reported in Poonchi sheep [2]. Lower WC was reported in Purky sheep [6].

The average range in diameter in Poonchi sheep was 12-40 μ . Similar range value for RD was reported in Poonchi sheep [2]. Correlations for different wool production traits in Poonchi sheep are presented on Table 2. The phenotypic correlations among wool traits ranged from -0.691 ± 0.056 (FD & WC) to 0.777 ± 0.049 (CWY & FD). The phenotypic correlation values of FD with all other wool traits of the present study were significant (positive as well as negative). It had been observed that the phenotypic correlations among wool traits were very low and most of them were negative except for correlations between CPI & M; CPI & WC; SL & WC; CWY & FD; CWY & M; and FD & M. Similar type of phenotypic correlations between different wool traits were reported in Poonchi sheep except for CPI & SL and CPI & M [2]. Similarly positive phenotypic correlations between FD & CWY were reported in Purky sheep and in Poonchi sheep [6, 2]. Negative correlations between different wool traits in Purky sheep were also reported [6]. Significant correlation between crimps and FD, and non-significant correlations between FD & SL and crimps & SL were reported in Hamadani sheep [3]. Positive and highly significant correlations between CWY & FD; CPI & M and FD & M indicates that improvement of any trait there will be improvement in other traits simultaneously.

Table 1: Averages of different wool production traits like crimps per inch (CPI), staple length (SL), clean wool yield (CWY), fibre diameter (FD), medullation (M) and wool count (WC) of Poonchi sheep

Wool parameters	No. of Obs.	Mean \pm SE	SD	Range	CV (%)
Crimps per inch	123	8.67 ± 0.18	1.99	6-14	22.96
Staple length (cm)	168	3.82 ± 0.07	0.97	1.5-5.5	25.24
Clean wool yield (%)	168	63.14 ± 0.23	2.98	54.16-70.73	4.72
Fibre diameter (μ)	168	24.99 ± 0.13	1.63	21.05-32.82	6.52
Medullation (%)	37	2.22 ± 0.19	1.14	1.33-6.75	51.35
Wool counts	168	58.13 ± 0.17	2.17	48.0-64.0	3.73
Range in diameter (lower) (μ)	168	11.75 ± 0.07	0.96	10.0-14.0	8.16
Range in diameter (upper) (μ)	168	39.74 ± 0.31	3.96	34.0-56.0	9.96

Table 2: Phenotypic correlations for crimps per inch (CPI), staple length (SL), clean wool yield (CWY), fibre diameter (FD), medullation (M) and wool count (WC)

	SL	CWY	FD	M	WC
CPI	-0.002 ± 0.091	-0.137 ± 0.090	$-0.223^* \pm 0.089$	$0.654^{**} \pm 0.437$	0.085 ± 0.091
SL	-	$-0.309^{**} \pm 0.074$	$-0.350^{**} \pm 0.073$	-0.031 ± 0.169	$0.317^{**} \pm 0.074$
CWY		-	$0.777^{**} \pm 0.049$	$0.329^* \pm 0.156$	$-0.552^{**} \pm 0.065$
FD			-	$0.567^{**} \pm 0.139$	$-0.691^{**} \pm 0.056$
M				-	$-0.564^{**} \pm 0.140$

* $P < 0.05$, ** $P < 0.01$

Conclusion

The results indicated that the wool characteristic of Poonchi sheep is distinct. This sheep population is under threat due to introduction of more fine wool and faster growth exotic sheep breeds like Merino and Rambouillet in the breeding tract. Poonchi sheep is most suitable to the local climatic stress and harsh environmental condition, and a recognised sheep breed of our country. The farmers should be motivated to rear this sheep for in-situ conservation by giving some incentives or proper price of wool. Random crossbreeding with other germplasm like Rambouillet and Merino breeds should be checked and must be controlled. The state government should imply strong breeding policy for maintaining the germplasm in pure form and encourage the farmers with incentives to maintain this sheep breed in its own breeding tract and increase the population.

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