Quantification of Reproductive Traits and Wool Characteristics of Lesser Known Gang-Fatehpuri Sheep of Uttar Pradesh

M. K. Verma, V. K. Singh, A. K. Verma, J. Singh, S. Gautam, V. K. Pal, H. C. Verma

ABSTRACT

The data of various reproductive performances and wool characteristics of lesser known Gang-Fatehpuri sheep maintained under the farmer's flocks in Fatehpur district of Uttar Pradesh were recorded and analyzed to evaluate the effect of non-genetic factors on these traits of Gang-Fatehpuri sheep. The least square means for age at first matting, age at first lambing, service period, lambing interval and litter size were 422.42±8.01, 604.54±5.82, 159.98±6.65, 310.86±7.14 days and 1.02±0.02 respectively. The least square means were observed to be 414.88±11.89 g, 49.51±01.50 µ, 3.51±0.19 cm and 62.73±1.97 % for greasy fleece yield, fiber diameter, staple length and medullation percentage, respectively. The season of birth was found to be significant effect (p<0.01) on age at first lambing, greasy fleece yield and medullation percentage.

Keywords Gang-Fatehpuri, Reproduction traits, Wool traits.

M. K. Verma[1], V. K. Singh[2], A. K. Verma[3]*, J. Singh[4], S. Gautam[5], V. K. Pal[6], H. C. Verma[7]

[1] Assistant Professor, Department of Animal Genetics and Breeding
[2,4] Professor, Department of Animal Genetics and Breeding
[3] Assistant Professor, Department of Livestock Farm Complex
[5] Assistant Professor, Department of Animal Nutrition
[6] Department of Veterinary Parasitology
[7] Department of Veterinary Extension Education

[1,2,3,4,5,6,7] College of Veterinary and AH, ANDUAT, Kumarganj, Ayodhya, Uttar Pradesh 224229, India

Email: ajeetverma95@gmail.com
*Corresponding author

INTRODUCTION

India has got rich source of diverse ovine germplasm with 74.2 million sheep (Livestock census 2019). In India, Uttar Pradesh has 10th rank with 1.0 million sheep populations (Livestock census 2019). The lesser known Gang-Fatehpuri sheep is a medium to large sized animals, well suited for mutton and highly coursed wool production and distributed in and around the Fatehpur district of Uttar Pradesh. This Gang-Fatehpuri sheep was apparently differs from Muzaffarnagari and Jalauni sheep. These sheep play an important role in livelihood of backward Pal/Gadariya community of Fatehpur and adjoining districts of Uttar Pradesh.

Reproductive and wool performances of sheep are important aspect of sheep husbandry and limiting factors in economics of sheep rearing. Reproductive performances are directly correlated the growth and

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productive performance of livestock. The performances of livestock are much influenced by genetic as well as environmental factors. The knowledge of reproductive performance and production status are prerequisites for formulation of effective breeding programs for genetic improvement of a population. To the best of our knowledge, no reports were available regarding reproductive traits and wool characteristics of Gang-Fatehpuri sheep. Thus, present study was aimed to evaluate the reproductive and wool characteristics of lesser known Gang-Fatehpuri sheep of Uttar Pradesh, as a part of its recognition and registration as a new sheep breed.

MATERIALS AND METHODS

The hundred Gang-Fatehpuri sheep maintained at farmer's flock in Fatehpur district of Uttar Pradesh, were taken under study. The reproductive parameters viz. age at first mating, (AFM), age at first lambing (AFL), lambing interval (LI), service period (SP) and litter size (LS) and wool quality traits viz., staple length (SL), fiber diameter (FD) and medullation percentage were studied. The data regarding traits under study were collected by face to face interview method using pre tested questionnaire from 15 farmer's flocks in Fatehpur district. Data of reproduction and wool traits were divided into two seasons of ewe's birth (1st: Jan -Jun, and 2nd: Jul-Dec). Total 20 wool samples were collected and analyzed for wool quality parameters at CSWRI, Avikanagar, Rajasthan. The data were analyzed by least square procedure by fitting constants using LSMLMW program (Harvey 1990). The statistical model used to discern the influence of non-genetic factor for reproductive/wool parameters was as follows:

$$Y_{ij} = \mu + A_i + e_{ij}$$

Where,
Y_{ij} = is the reproductive /wool trait of the jth animal born in i^{th} season.
μ = overall mean.
A_i = effect of ith season of birth (season 1st: 1; season 2nd : 2).
e_{ij} = residual random error, NID (0, σ2).

RESULTS AND DISCUSSION

Reproductive traits

The reproductive traits under study were depicted in Table 1.

The overall mean of age at first mating was 422.42±8.01 days. Unlike current observations, lower age at first matting was reported in Jalauni (Sahana *et al.* 2004), Ganjam (Nayak *et al.* 2008) and Deccani breeds of sheep (Kumar *et al.* 2017), whereas, higher values were observed in Nali (Dey and Poonia 2005), Malpura (Gowane *et al.* 2014), and Chokla breeds of sheep (Mehrotra *et al.* 2019). The overall mean of age at first lambing was 604.54±5.82 days. In contrary to our findings, lower age at first lambing were reported Pugal (Dass 2008), Munjal (Yadav *et al.* 2011) and Muzaffarnagari crossbred sheep (Asadazzaman *et al.* 2020), however, higher values were recorded in Marwari (Gohil 2010), Magra (Chander 2012), and Munjal sheep (Umeel *et al.* 2018). The average service period was 159.98±6.65 days. Conversely to our observations, lower service period was reported in Pugal sheep (Dass 2008) and local sheep of Faizabad (Chand *et al.* 2018), however, higher service period in Chokla sheep (Mehrotra *et al.* 2019). The average

Table 1. Reproductive traits of Gang- Fatehpuri sheep.

Factor	AFM (days)	AFL (days)	SP (days)	LI (days)	Litter size
Overall	422.42±8.01 (100)	604.54±5.82 (100)	159.98±6.65 (90)	310.86±7.14 (90)	1.02±0.02 (100)
1st Season	426.98±9.21 (65)	601.14±4.90[a] (65)	157.85±6.20 (59)	313.09±8.74 (59)	1.00±0.00 (65)
2nd Season	416.37±7.52 (35)	614.54±6.06[b] (35)	162.70±9.15 (31)	308.53±6.02 (31)	1.07±0.07 (39)

Table 2. Wool characteristics of Gang- Fatehpuri sheep.

Factor	GFY (gm)	FD (µ)	SL (cm)	Medulattion %
Overall	414.88±11.89 (100)	49.51±1.50 (20)	3.51±0.19 (20)	62.73±1.97 (20)
1st Season	445.73±16.68[b] (61)	51.24±2.35(10)	3.78±0.18 (10)	56.93±2.66[a] (10)
2nd Season	378.70±13.71[a] (39)	47.79±1.81 (10)	3.33±.23 (10)	68.53±1.33[b] (10)

lambing interval was 310.86±7.14 days. As compared to current observations, lesser lambing interval was observed in Pugal (Dass 2008) and Munjal sheep (Poonia 2008) and higher lambing interval in Jalauni (Sahana *et al.* 2004), Malpura (Gowane *et al.* 2014), and Munjal (Umeel *et al.* 2018) sheep breeds.The litter size was usually single and twinning was very rare and our findings are in agreement with observations in Jalauni (Sahana *et al*. 2004) and Ganjam sheep (Nayak *et al.* 2008). Conversely, higher litter size was recorded in high prolific Garole sheep (Nimbkar *et al.* 2003, Mishra *et al.* 2005, Prakash *et al.* 2017).

Wool parameters

Various wool parameters were depicted in Table 2.

The least square mean for greasy fleece yield of was 414.88 ±11.89 g. Unlike present observations, lower greasy fleece weight were observed in Jalauni sheep (Sahana *et al.* 2004) and Garole breed of sheep (Banerjee *et al.* 2009) and higher greasy fleece yield were reported in Magra (Singh *et al.* 2018), Malpura (Paswan *et al.* 2016), Patanwadi (Gupta *et al.* 2015), and Muzaffarnagari sheep (Dass *et al.* 2019). The mean of fiber diameter of examined wool samples was 49.51±01.50 µ. In contrast to present findings, lower fiber diameter was reported in Marwari (Narula *et al.* 2012) and Gurez sheep (Ahanger *et al.* 2020), however, Banerjee *et al.* (2009) reported slightly higher fiber diameter in Garole sheep. The average staple length was found to be 3.51±0.19 cm. Unlike present observations, higher staple length was recorded in Magra (Dass *et al.* 2003, Singh *et al.* 2018), Munjal (Poonia 2006) and Gurez breed of sheep (Ahanger *et al.* 2020). The mean of total medulation (62.73±1.97%) in present study was comparable with observations in Munjal sheep (Poonia 2006). Conversely, lower total medulation was observed in Marwari sheep (Narula *et al.* 2012), Magra sheep (Singh *et al.* 2018), and

Gurez sheep (Ahanger *et al.* 2020), however, higher medulation percentage in Jalauni (Sahana *et al.* 2004) and Garole breed of sheep (Banerjee *et al.* 2009).

The effect of season of birth was found to have significant effect (p<0.01) on AFL, GFY and medulation percentage. The lambs born in 1st season earlier age at first lambing, higher greasy fleece yield with lower medulation percentage might be due better nutrition with succulent pasture availability and ambient environment conditions in early growing age of lambs. Similarly, Mandakmale *et al.* (2013) and Mehrotra *et al.* (2019) also reported significant effect of season of birth on AFL in Sangamneri strain of Deccani and Chokla sheep breeds, respectively. Arora *et al.* (2007), Dixit *et al.* (2011) and Singh *et al.* (2018) reported significant effect of lamb's birth season on greasy fleece yield in Jaisalmeri, Bharat Merino and Magra sheep, respectively. Nehra *et al.* (2005) observed significant effect on wool medulation in Bharat Merino and Kashmir Merino sheep.

The findings of present investigation can be concluded that the reproductive parameters of this ovine genetic group are moderate and needs the selective breeding to achieve better reproductive performances. The wool production was lower and wool quality also very poor, needs to genetic improvement.

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