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Evaluation of production performance of Kashmir Merino sheep under field conditions

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Abstract

Kashmir Merino is one of the improved sheep breed which has originated from crosses of different Merino types with predominantly migratory native sheep breeds of J and K. There is no literature available regarding production performance (prolificacy, fine wool yield and body weight) of Kashmir Merino sheep under field conditions, therefore, the present study was undertaken. The information regarding prolificacy and fine wool yield was obtained through a pre-structured questionnaire from 94 sheep farmers, while as body weights were personally recorded from 578 sheep belonging to various age groups. 90-100% lambing in first, second and third parturition was reported by majority of respondents respectively. Majority reported no twining in their flock during first lambing, 1-4% twining during second and third lambing. All the respondents reported two shearing's per year. Majority shored their sheep during feb-march and sept-oct whereas some respondents had their one clip during the month of july. Average wool yield of 500-1000gm in feb-march, 750-1500gm in july and 1000-2000gm in sept-oct shearing was reported by majority of farmers. The overall mean values for body weight (kg) in Kashmir Merino sheep at temporary-tooth, 2-tooth, 4-tooth, 6-tooth, 8- tooth and at broken mouth were (27.33), (34.02), (38.37), (40.26), (43.13), (40.62), respectively. The body weight of males at 4-tooth, 6-tooth and 8-tooth was significantly higher ($p < 0.05$) than that of the females. No significant difference was observed between the two sexes at temporary-teeth & 2-tooth age groups.

Keywords: Kashmir Merino, prolificacy, body weight, wool yield, field livestock

Introduction

Livestock sector plays an important role in shaping the rural economy of India. It is an agrarian country in which agriculture constitutes the back bone of its economy with livestock sector nearly contributed 4.11% to the total GDP at current prices during 2012-13 [2]. The J&K has 9.2 million livestock excluding poultry with a population of small ruminants 5.4 million representing about 59% sheep alone (3.389 million), which constitutes approximately 37% of total livestock population [2]. The J and K is agriculture dependent economy having about 73% population residing in rural areas which are associated with agriculture and allied sectors with livestock as one of the constituents [3].

The J&K is ideally fit for sheep rearing because of its favorable agro-climatic conditions, ample alpine pastures and presence of other natural endowments. Sheep rearing is the important activity of rural masses in this region which plays a significant role in socioeconomic upliftment of weaker sections of the society. Sheep has excellent adoption for utilization of wasteland as well as low and high pastures converting them into high quality proteins in the form of meat and wool. Besides, sheep are gregarious in nature and are less prone to extreme environmental conditions prevailing in the valley during winter, thus are considered as integral component of temperate ecosystem of the J and K. This region has a native sheep known as Kashmir Merino. It is a crossbred strain developed by crossing Gaddi, Bhakarwal and Poonchi with 50 to 75% exotic inheritance of Rambouillet and Merino sheep in J and K [20]. The growth performance of Kashmir Merino over the years has declined and needs to be addressed by effective development programmes. Because of this reason and scanty literature available, a study on production parameters of Kashmir Merino under field conditions was undertaken.

Materials and Methods

The proposed work was undertaken in the four community development (CD) blocks of district Srinagar.

Srinagar city is located at an average elevation of 1600 meters above mean sea level and it is spread over in the heart of the oval shaped Valley of Kashmir. It is situated between 740-56' and 750-79' East Longitude and 330-18' and 340-45' North Latitude. Srinagar has a humid subtropical climate, much cooler than what is found in much of the rest of India, due to its moderately high elevation and northerly position. The valley is surrounded by the Himalayas on all sides. Winters are cool, with daytime a January average of 2.5°C (36.5°F), and temperatures below freezing at night. Moderate to heavy snowfall occurs in winter and the only road that connects Srinagar with the rest of India may get blocked for a few days due to Avalanches. Summers are warm with a July daytime average of 24.1°C (75.4°F). The average annual rainfall is around 710 millimetres (28 in). Spring is the wettest season while autumn is the driest. The highest temperature reliably recorded is 38.3°C (100.9°F) and the lowest is -20.0°C (-4.0°F) [4].

The investigation was undertaken, in collaboration with the extension wing of Sheep Husbandry Department, in four community development (CD) blocks of district Srinagar (Srinagar North, Srinagar South, Khanmoh and Harwan block). A total of 94 farmers involving 29, 27, 16 and 22 farmers from Srinagar North, Srinagar South, Khanmoh and Harwan were selected, respectively. This was because of uneven distribution of sheep populations in the study areas. The visited sites in each CD block were selected on the basis of having a higher concentration of livestock in urban and peri-urban areas. At each study site, the farmers were randomly selected from a list of breeders available with Sheep Extension Centres. Each flock owner was interviewed face to face at their homesteads using pre-structured questionnaire to get information regarding prolificacy (single births & twinning) and fine wool yield. However, body weights were personally recorded from 578 sheep belonging to various age groups with the help of weighing balance.

The data obtained was analyzed by one-way ANOVA as per Snedecor and Cochran [19] and to test significance of difference between means Duncan's multiple range test was used. Analysis was carried out using Statistical Package for the Social Sciences (SPSS version 20.0).

Results

Prolificacy

The response regarding single births and twinning has been presented in Fig 1 & 2.

Single births

First Lambing (L-1): Majority of the respondents (59.57) reported 90-100% lambing in first parturition while as 70-80% lambing and 50% lambing was reported by 34% & 6.3% respondents respectively.

Second Lambing (L-2): 78.7% of the respondents reported 90-100% lambing in their flock whereas 70-80% lambing was reported by just 21.2% of the respondents.

Third Lambing (L-3): Majority (82.9%) of the respondents reported 90-100% lambing during third parturition while as 17% reported 70-80% of lambing.

Twinning

First Lambing (L-1): Majority of the respondents (59.5%) reported no twinning in their flock whereas 40.4% reported twinning of 1-4%.

Second Lambing (L-2): 48.9% of the respondents reported no

twinning whereas almost similar proportion (51%) reported twinning of 1-4%.

Third Lambing (L-3): No difference in twinning percentage was observed during second or third lambing.

Fine Wool Yield

The response regarding single births and twinning has been presented in Table 1. All the respondents reported two shearing's per year. Majority (89.3%) of the farmers shored their sheep during February-March and September-October whereas some respondents (10.6%) had their one clip during the month of July.

Wool Yield (February-March): Majority (73.4%) of the respondents reported average wool yield of 500-1000gm followed by 11.7% (<500gm), 9.5% (>1000gm) and 5.3% (nil). Block-wise breakup of respondents from North, South Khanmoh & Harwan blocks reported the wool yield in the category of <500gm, 500-1000gm, >1000gm & nil were (74.1%, 14.8%, 0.0%, 0.0%), (62%, 85.1%, 100%, 54.5%), (13.7%, 0.0%, 0.0%, 22.7%), (0.0%, 0.0%, 0.0%, 22.7%) respectively.

Wool Yield (July): Just 10.6% of the respondents shored their sheep in the month of July with average wool yield of 750-1500gm while as 89.3% respondents didn't prefer shearing in midsummer. Block-wise breakup of respondents from North, South Khanmoh and Harwan blocks reported the wool yield in the category of nil and 750-150gm were (100%, 85.1%, 93.7%, 77.2%), (0.0%, 14.8%, 6.2%, 22.7%) respectively.

Wool Yield (September-October): Majority of the respondents (86.1%) reported average wool yield of 1000-2000gm followed by 8.5% (500-1000gm) & 5.3% (nil). Block-wise breakup of respondents among North, South Khanmoh & Harwan blocks reported the wool yield in the category of <500gm, 500-1000gm, >1000gm & nil were (0.0%, 0.0%, 0.0%, 0.0%), (0.0%, 7.4%, 0.0%, 27.2%), (100%, 77.7%, 93.7%, 72.7%), (0.0%, 14.8%, 6.2%, 0.0%), respectively.

Body Weight

The results of body weights of Kashmir Merino sheep at different age groups has been presented in Table 2. The overall mean values for body weight (kg) in Kashmir Merino sheep at temporary-tooth, 2-tooth, 4-tooth, 6-tooth, 8-tooth and at broken mouth were (27.33), (34.02), (38.37), (40.26), (43.13), (40.62), respectively. The body weight of males at 4-tooth, 6-tooth and 8-tooth was significantly higher ($p < 0.05$) than that of the females. No significant difference was observed between the two sexes at temporary-teeth & 2-tooth age groups.

Discussion

Prolificacy

Majority of the respondents reported lambing percentage of 90-100% during first (59.5%), second (78.7%) and third (82.9%) lambing indicating that there was an increase in lambing percentage from first parturition onwards. Majority of the respondents (59.5%) reported absence of twinning during first parturition whereas 40.4% reported 1-4% twinning. During 2nd and third parturition 51% of respondents reported twinning of 1-4%. These reports are in agreement with the results of Ganai *et al.* (2011) [11] who reported less than 1% twinning incidence in Changthangi sheep. The present study revealed a low prolificacy in the study area but it increased with increasing parity from first to second parturition.

However no effect of increase in parity from second to third lambing on twinning was reported. Earlier Jagatheesan (2001)^[12] reported no twinning was observed in Mecheri sheep breed of southern zone of Tamil Nadu. However, Bose *et al.* (1999)^[9] recorded litter size in Garole sheep as 1.7 with percentage of single, twin, triplet and quadruplet was 42, 43, 15 and 0.2, respectively. These results are in tune with the findings of Mishra *et al.* (2004)^[16] and Kandasarmy *et al.* (2006)^[13] who reported twinning percentage of 0.5 and 1.10, respectively. Similarly Banerjee (2008)^[7] reported litter size of 1.9 in native Bengal Garole sheep.

The number of lambs born alive per lambing is an important factor for increasing productivity as it contributes more to the total weight weaned per dam than the growth rate of the lamb. The potential of the twinning observed in some percentage of Kashmir Merino sheep gives it an advantage for meeting the meat requirement of the region and improving the socio-economic status of the people.

Fine Wool Yield

Efforts were aimed at improving sheep for fine wool production through introduction of exotic fine wool inheritance or up-gradation using the indigenous improved wool and Kashmir Merino was a success story. In the present study two shearing's were reported per year during February-March and September-October which is in conformity with the reports of Khan *et al.* (2013)^[15] & Ganie *et al.* (2010)^[10] observed in the sheep of Gurez. It was reported that Department of Sheep Husbandry deployed staff using portable shearing machine for shearing in different areas. Locally made hand shears were also used for shearing. No grading of wool was practiced but it was sold as a mixed lot. Majority of the respondents (73.4%) reported wool yield of 500-1000gm during February-March where as 86.1% reported wool yield of 1000-2000 gm during September-October. 2.5Kg of annual greasy fleece yield for a synthetic breed Avivastra and 3.0 Kg of annual greasy fleece yield for Bharat Merino has been reported^[18]. Similarly higher results for wool yield were reported earlier^[11, 14] in Changthangi sheep and Tirahi breed of sheep.

Body Weight

Body weight and linear measurements are important traits which decide the performance of the animals. Body weight is a frequently recorded variable to evaluate the growth of an animal. However, it varies from animal to animal^[1]. Sex had a significant ($p < 0.05$) influence on growth performance. The body weight of males at 4 tooth, 6 tooth and 8 tooth was significantly ($p < 0.05$) higher than that of the females. No significant ($p < 0.05$) difference was observed at temporary teeth & 2-tooth age group. The higher body weight were reported earlier^[6] in Hamadani sheep in Erbil plain, Jaisalmeri sheep of Rajasthan^[5], Munjal sheep of India^[21] and Sahel sheep breeds of Northern Ghana^[8]. Ganai *et al.* (2011)^[11] reported higher body weight for Changthangi sheep of Ladakh. Musavi *et al.* (2013)^[17] also reported higher body weight of Hazaragie sheep of Afghanistan. In the present study high body weight in males is probably due to genetic makeup, breeders selection for elite breeding rams, dominance of males during feeding or grazing etc.

Conclusion

The Kashmir Merino sheep has very well adapted to the harsh agro-climatic conditions of Jammu and Kashmir.

Management interventions, awareness programmes, incentives etc can help in augmenting the performance of this breed and net returns of farmers.

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