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Socio-economic status of Equine owners, Shelter Management Practices and Morphometry of Equines in District Ganderbal of Kashmir Valley

M. A. Bhat*[1], A. M. Ganai[2], D. M. Mir[1], G. G. Sheikh[3], J. Farooq[4] and Zulfiqarul Haq[5]

[1]PhD Scholar, Division of Animal Nutrition, F. V. Sc. & A. H., Shuhama, SKUAST-K, INDIA
[2]Professor, Division of Animal Nutrition, F. V. Sc. & A. H., Shuhama, SKUAST-K, INDIA
[3]Assistant Professor, Division of Animal Nutrition, F. V. Sc. & A. H., Shuhama, SKUAST-K, INDIA
[4]Assistant Professor, Mountain Research Centre for Sheep and Goat, F. V. Sc. & A. H., Shuhama, SKUAST-K, INDIA
[5]Senior Research Fellow, ICAR-Centre for Research on Poultry, Division of LPM, F. V. Sc. & A. H., Shuhama, SKUAST-K, INDIA

*Corresponding Author: mudasirnazir077@gmail.com

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Abstract

To fill the paucity of data and information on equines in Kashmir, which ranks second in India for population of equines, a field study was conducted to fill the void. In the study a cross sectional face to face survey was carried out in the district Ganderbal of Kashmir valley to ascertain the socio-economic status of equine owners, shelter management practices and morphometry of equines. The average land holding capacity of farmers in the district was 3.67±0.35 kanal/family and livestock strength/family averaged 5.15±0.69. Family size ranged from +4 to +5 members/ family indicating existence of small families with an average of 5.21±0.16 members/ family. The average literacy percentage among equine owners was 2.21±0.15 highest in Ganderbal followed by Lar and Kangan. The average of pucca house was 26.03% while kucha house was 73.97%. Proportion of shared shelters was significantly (P<0.05) higher in Kangan, Lar and Ganderbal respectively. Average age of the adult horses and lactating mares was 12.73±0.66 and 8.94±0.68 years. Mean age of the foals was 1.230±0.11, 1.56±0.13 and 1.50±0.11 years respectively, in Ganderbal, Kangan and Lar. Mean BCS of adult equines, foals and lactating mare was 4.39±0.22, 4.23±0.19 and 5.63±0.29 respectively. Adult equines, foals and lactating mare were found to carry a body weight between 231.05±4.42 kg, 165.99±8.83 and 250.17±8.58 kg, respectively in the district. From the present study it was concluded that the equine owners were socioeconomically weak and reared equines in order to add to their earnings. Since equines provide material avenues to the farmers and play an important role in socio economic upliftment of both rural and sub urban society, careful and scientific practices must be ensured to maintain healthy and vigorous equine.

Keywords: Equines, Kashmir, Morphometry, Socio-economic Status

Introduction

According to the World Bank Group (2018) report, 66% of total population of the country lives in rural areas where agriculture is the main source of income. The rearing of livestock is a very critical and core activity in the economic profile of Jammu and Kashmir state. In the livestock sector, equines play an important role in the economy of Jammu and Kashmir. They are important means of transport in the mountain areas, despite being affected by the incessant process of mechanization and rural development have continued to be useful (Sabina *et al.,* 2018).Their multifaceted roles in land management, restructuring the suburban countryside, maintaining relationships between urban citizens and cultural rural life contributes to agriculture diversification through horse livery, equine services and agritourism. According to Pal *et al*. (2013), horses are used as draught animals in many parts of world and based on their geographical localization they have been characterized in two breeds in India i.e. (Marwari and Kathiawari) and ponies (Bhutia, Spiti, Manipuri and Zanskari). In Jammu and Kashmir, equines are owned mainly by socially and economically deprived, landless, marginal and small farmers that play a very important role in the socio-economic life of the population (Fazili and Kirmani, 2011). The equines in the state play an important role in tourism industry including pilgrim tourism. The Amarnath (Kashmir) and Vaishnu Devi (Jammu) yatra (Pilgrimage) by millions of Hindus every year would not have been possible without this quadruped (Fazili and Kirmani, 2011). Some horse breeds like Zanaskari are under threth and government of India has approved project proposal of the Department of animal husbandry for their conservation. With very scanty literature available on role of equines on socio-economic upliftment of rural economies in Jammu and Kashmir, this work was conceived in consonance with the equine shelter management practices and morphometry, which are discussed in detail.

Materials and Methods

For present study a cross-sectional face to face survey was carried out in three equine rearing blocks of Ganderbal. Data was collected from 90 randomly selected equine owners from Ganderbal through a questionnaire based on various aspects of horse rearing like farmers family size, occupation, total income, land holding, number of animals reared, shelter management, number of equines reared with their age and approximate body weight description. Body weight was calculated using body measurements according to Gina (2010) and age was calculated according to Loch and Bradley (1998). Body condition score was calculated according to Rasmus *et al* (2015). Data collected were processed and analyzed as per Snedecor and Cochran (1994) by using descriptive statistical method for analysis of variance and significance of mean differences (DNMRT). The significance between different proportions was tested using test of proportions.

Results and Discussion

Present study was conducted in district Ganderbal of Kashmir Valley for which 90 families in three blocks where selected. The survey included a total of 90 adult horses, 12 lactating mares and 24 foals. The average land holdings of the farmers in district Gnderbal were recorded to be 3.46±0.35, 4.60±0.90 and 2.96±0.37kanal/family in Ganderbal, Kangan and Lar blocks of district Ganderbal, respectively with an overall average of 3.67±0.35 kanal/family in the district (Table 1).

Table 1: Socioeconomic status of equine owners in district Ganderbal

Block	Land holding (Kanal /family)	Livestock strength	Equine population	Family size	Literacy (No of literate persons in family)	Monthly income
Ganderbal	3.46^{a} ±0.35	2.33^{a} ±0.29	1.90^{ab} ±0.15	5.13^{ab} ±0.28	2.33^{a} ±0.25	12900.00^{a} ±915.19
Kangan	4.60^{a} ±0.90	10.43^{b} ±1.65	2.20^{b} ±0.21	5.83^{b} ±0.23	2.10^{a} ±0.26	16433.33^{b} ±957.34
Lar	2.96^{a} ±0.37	2.62^{a} ±0.38	1.50^{a} ±0.14	4.66^{a} ±0.27	2.20^{a} ±0.30	14400.00^{a} ±970.36
Mean	**3.67^{A} ±0.35**	**5.15^{B} ±0.69**	**1.86^{A} ±0.10**	**5.21^{B} ±0.16**	**2.21^{A} ±0.15**	**14577.77^{B} ±562.44**

Note: Means across rows in same column for different blocks in a particular district bearing different small case superscript differ significantly (P<0.05).

The average land holding was much lower than reports recorded earlier (Ganai *et al.*, 2004, Tiwari *et al.*, 2007, Bhat *et al.*, 2010). A wide variation was observed in land holdings capacity of farmers which collaborated well with the reports of Hassan *et al* (2016). The small land holding could be attributed to rearing of equines by marginal farmers of the state and partly due to divisions of ancestral land over a period of generations.

Livestock strength/family in district Ganderbal averaged 5.15±0.69 (Table 1), which corroborates well with the findings of Bhat *et al* (2010), however Hassan *et al* (2016a and 2016b) reported average livestock strength of equine rearing farmers 5.37 and 5.69/family in district Budgam and Baramulla respectively. Livestock strength reported in present study were much lower than earlier reports of Ganai *et al.* (2004) which may be attributed to adoption of different farming practices by the equine owners in the present study. The average number of equines/family in Ganderbal, Kangan and Lar blocks of district Ganderbal were, 1.90±0.15, 2.20±0.21 and, 1.50±0.14 respectively with an overall average of 1.86±0.10 in the district. Data with regard to family size ranged from +4 to +5 members/ family in Ganderbal district (Table 1), indicating existence of small families with an average of 5.21 members/ family. The average literacy percentage among equine owners was 2.21±0.15 (Table 1) highest in Ganderbal followed by Lar and Kangan which may be attributed to higher education facilities in urban areas of districts compared to rural areas. The low literacy rate may be attributed to the fact that only poor, landless and marginal farmers were rearing equines. The overall literacy rate in Ganderbal reported by census (2011) is 67.16%. Average income of equine farmers in district Ganderbal was 14577.77±562.44 (Table 1), highest in Kangan followed by Lar and Ganderbal respectively. The present results fall in line with the earlier observations of Hassan *et al.*, (2016a and 2016b)

Percentage of different human and animal shelter types possessed by the farmers of district Ganderbal are presented in Table 2. The average of pucca house was 26.03% while kucha house was 73.97%. The mean values of Lar and Ganderbal did not reveal any significant difference statistically ($P<0.05$), however the mean values of Lar and Ganderbal were significantly higher statistically than Kangan. The observations were in agreement with the observations of Hassan *et al.*, (2016a and 2016b). Since most of the farmers the districts possessed equines as well as livestock, shelters observed were either separate or shared for equines and other livestock species.

Table 2: Animal and residential shelter type in district Ganderbal

Block	Animal shelter		Residential Shelter	
	Pucca	**Kucha**	**Pucca**	**Kucha**
Kangan	14.35^{b}	85.65^{a}	61.03^{a}	38.97^{b}
Lar	34.28^{b}	65.72^{a}	59.48^{a}	40.52^{b}
Ganderbal	29.46^{b}	70.54^{a}	54.59^{a}	45.41^{b}
Mean	**26.03**	**73.97**	**58.36**	**41.63**

Note: Values (in %) across rows in same column for different blocks in a particular district bearing different small case superscript differ significantly (P<0.05)

Housing system was either separate for equines or was shared with other livestock, which may be attributed to extreme weather conditions of the state and need for protection from predators however, absence of proper ventilation in permanent structures indicated lack of awareness among farmers/ livestock owners. The proportion of separate equine shelters was 54.67%, 31.74% and 40.50% (Table 3) in Ganderbal, Kangan and Lar blocks, respectively, which was found to be higher in Ganderbal followed by Lar and Kangan. Proportion of sheared animal shelters was found to be 45.33%, 68.26% and 59.50%, respectively. Observations corroborate well with the observations of Hassan *et al* (2016a and 2016b). Contrarily to our observation, Swai and Bwanga (2008) reported that 74% equine owners did not provide any shelter to their equines in Tanzania while Wylie *et al* (2013) reported that only 4% or more animals were provided housing, which increased during winter season. Equines were examined for morphometric parameters like age, body condition score and body weight, since body weight and BCS are the indicators health status of the animal. Average age of the adult horses and lactating mares was 12.37±0.66 and 8.94±0.68 (Table 4) years in district Ganderbal. However the average of age of adult horses where significantly ($P<0.05$) higher in Kangan followed by Lar and Ganderbal. Burk *et al* (2008) reported that the average age of eventing horses in their study was 11.1±0.3 years. Rao *et al* (2010) reported that the average age of horses and mules among the sample population was 7.91 and 7.08 years, respectively. Mean age of the foals was 1.23±0.11, 1.56±0.13 and 1.50±0.11 years (Table 4), respectively, in Ganderbal, Kanghan and Lar.

Table 3: Animal shelter types in district Ganderbal

Block	Shelter status	
	Separate	**Shared**
Ganderbal	54.67[a]	45.33[a]
Kamgan	31.74[b]	68.26[a]
Lar	40.50[b]	59.50[a]
Mean	**42.30[A]**	**59.69[A]**

Note: Values (in %) across rows in same column for different blocks in a particular district bearing different small case superscript differ significantly (P<0.05).

Table 4: Age (Years) of equines in district Ganderbal

Type of equine/Blocks	Ganderbal	Kangan	Lar	Mean
Adult horse	10.72[a] ±0.69	15.50[b] ±1.60	10.90[a] ±0.63	**12.37[A] ±0.66**
Foal	1.23[a] ±0.11	1.56[a] ±0.13	1.50[a] ±0.11	**1.43[A] ±0.11**
Lactating mare	9.36[a] ±0.83	8.53[a] ±0.54	NA	**8.94[A] ±0.68**

Note: Means within the rows with different lower case superscripts for different blocks differ significantly (p<0.05). Overall means of the district with different uppercase superscripts between the rows differ significantly (p<0.05). NA = data not available.

Table 5: Body condition score of equines in district Ganderbal

Type of equine	District Ganderbal			
	Ganderbal	Kangan	Lar	**Mean**
Adult horse	5.40[a] ±0.33	5.16[a] ±0.31	5.00[a] ±0.32	**5.18[A] ±0.18**
Foal	4.50[a] ±0.28	3.70[a] ±0.26	4.41[a] ±0.41	**4.23[A] ±0.19**
Lactating mare	5.00 ±0.32	6.40 ±0.40	NA	**5.63[A] ±0.29**

Overall means of the district with different uppercase superscripts within the column differ significantly (p<0.05) NA = data not available.

Mean BCS of adult horses in district Ganderbal was 5.18±0.18 (Table 5), higher in Ganderbal followed by Lar and Kangan. The average BCS in foals and lactating eves was 4.23±0.19 and 5.63±0.29 respectively. Similar to our present observation on adult equines, Gallagher *et al* (1992) reported an overall BCS of around 5.0 in racing thoroughbreds. Burk, *et al* (2008) also reported a BCS of 4.9±0.1 in one group of equines in his study. Our results corroborate well the observations of Hassan *et al* (2016b and 2016c) who recorded average BCS of 4-5 in adult equines in Budgam and Baramullah. Body weight of the equines was accessed using body measurements as given by Gina (2010). Adult equines were found to carry a body weight between 231.05±4.42 kg in district Ganderbal which was similar to the observations reported by Rao *et al* (2010) where the average body weight of horses among the study population was 231.07 kg. Hassan *et al* (2016b) recorded body weight of 255.86 and 260.86 in district Baramullah and Budgam. Average body weight of lactating mares and foals recorded in present study are comparable with earlier observations of Hassan *et al* (2016b and 2016c). However, contrary to present observation, Pal *et al* (2013) reported an average body weight of 350 kg in Marwari horses in Rajasthan. Less weight in present study could be due to breed differences since Marwari horses are large and hefty in built while as Jammu and Kashmir possesses small non-descript equines other than the Zanskari horses found in Ladakh region of the state(Table 6).

Table 6: Body weight (Kg) of equines in district Anantnag and Ganderbal (Mean ± SE)

District	Type of equine			
	Block	**Adult Horse**	**Foal**	**Lactating mare**
Ganderbal	Ganderbal	232.70[a] ±8.77	168.42[a] ±7.35	264.85 ±5.93
	Kangan	223.46[a] ±7.30	163.25[a] ±9.22	235.50 ±11.24
	Lar	237.00[a] ±6.84	166.3[a] ±9.93	NA
	Mean	**231.05[B] ±4.42**	**165.99[A] ±8.83**	**250.17[A] ±8.58**

Means within the same column with different lower case superscripts differ Significantly ($p<0.05$), Overall means of the district with different uppercase superscripts within the column differ significantly ($p<0.05$)NA = data not available.

Conclusion

Present study was conducted in district Ganderbal of Kashmir Valley in 90 families with three blocks. It can be concluded that rearing of equines is mostly confined to small marginal farmers of the state. Shelter facility for horses was very poor and overall keeping conditions of foals or lactating mare was poor. Farmers associated with equines in Kashmir are in under privileged conditions and are in urgent need of necessary steps like conservation and development of horse genetic resources along with improvement of the socioeconomic status of horse keepers of Kashmir.

Conflict of Interests

The author expresses no conflict of interest with any other individual or organisation regarding the information discussed in the manuscript.

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