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Short Communication

Body Weight Changes in Magra Sheep with Management by Farmers

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The arid zone, which constitutes 12% of the total land area of India, is mostly confined to western states (Shankar *et al.*, 1988) and small ruminants are the major assets as seasonal crops are a gamble in the rain fed agriculture. The desert harbors one of the best carpet wool breed named Magra whose breeding tract is confined to Bikaner and adjoining areas of Churu, Ganganagar and Jaisalmer districts of Rajasthan. Sheep husbandry is the main occupation; cattle, goat, camel are other species which are reared by farmers in the region. Under such harsh environmental conditions small ruminant production is primarily dependent upon grazing natural wastelands, crop stubbles/ residues and top feeds. Thus bare minimal is spent on feeding of sheep in the region. Most of the sheep population migrate to adjoining states during the months of March/April and return back with onset of monsoon during July/August. During drought years migration period may prolong even up to 12 months or more during which animals survive on forages available on roadsides and stubbles of harvested crops. However, some of the progressive farmers, keeping stationary flocks, practice short duration migration and supplement, especially pregnant/lactating and the young stocks, so that the lamb fetches better market price. Keeping above in view body weights of animals were recorded from stationary flocks maintained on common property resources alone or in combination with supplementation to ascertain sustainability of grazing areas and to know effect of management practices followed by different farmers for rearing of sheep.

The village Ladera in Lunkaransar tehsil adopted under Transfer of Technology Programme by Central Sheep and Wool Research Institute, Arid Region Campus, Bikaner, was chosen for the present study. Body weights of different sheep classes and sheep husbandry practices followed by farmers were recorded during first week of September 2004 and 2005. Whereas other flocks in the village remained out of state for migration in search of fodder due to drought. The main occupation of the villagers is rearing of sheep. The village has 500 bighas common grazing land. A total of 739 animals belonging to six farmers were weighed. Farmers usually collect and dry leaves of khejri (*Prosopis cineraria*) and green twigs of phog (*Colligonum polygonoides*) for supplementation during scarcity. The major biomass available on pasture includes bui (*Aerva sativa*), pala bushes (*Zizyphus nummularia*), murat (*Panicum turgidum*) and gokhru (*Tribullus terrestris*). Most of the farmers feed bajra flour to lambs by making syrup along with water and they supplement groundnut chara (*Arachis hypogea*)/ guar phalgati (*Cyamopsis tetragonoloba*) to lactating ewes. The data was statistically analyzed using LSMLMW computer programme (Harvey, 1990). The effect of management by farmers, supplementary feeding, sex and year on body weight of sheep of various classes was studied.

The mean live weights of suckling (birth to 1 M age), weaner (3 M to 6 M age), hoggets (6 M to 12 M age) and adult animals (>1 year age) were 10.13, 15.53, 23.08 and 30.31 kg (Table 1). Differences in the suckling group among different farmers was observed, this could be due to better management of lactating animals in their flocks, but the differences were non-significant; similar observations were recorded in suckling, weaner and adult group. This shows that all the farmers take due care of lactating ewes and raising of newly born lambs to avoid mortality due to lack of nutrition. Differences among body weights of hogget group were significant ($P \leq 0.01$), reflecting differences due to management by the farmers, highest weight was observed in animals reared by Farmer 3 and lowest in animals of Farmer 4. The hogget group is mainly kept on field grazing. The farmers who are conscious about income provide supplement hogget group during critical growth period as this helps to fetch higher income

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Table 1. Lest square means of body weight across the farmers, feeding group, sex and year on performance of animals

Attribute	Suckling	Weaner	Hogget	Adult
Mean live weight (kg)	10.13±2.70 (52)	15.53±2.95 (15)	23.08±4.05 (242)	30.31±4.42 (430)
Farmer 1	10.33±1.19 (5)	–	24.78^{cd}±0.63 (25)	31.03±0.59 (50)
Farmer 2	12.04±0.73 (14)	16.43±0.61 (10)	23.37^{c}±0.30 (104)	31.53±0.30 (190)
Farmer 3	9.27±0.81 (29)	12.23±1.25 (3)	25.33^{d}±0.46 (74)	30.73±0.43 (140)
Farmer 4	9.93±1.90 (2)	15.44±1.48 (2)	17.89^{a}±0.71 (22)	29.35±1.63 (6)
Farmer 5	–	–	24.73^{cd}±1.06 (9)	29.69±1.27 (10)
Farmer 6	9.68±1.90 (2)	–	20.23^{b}±1.12 (8)	31.97±0.73 (34)
Farmer	NS	NS	**	NS
Un-supplemented	9.66±0.61 (42)	14.68±0.99 (9)	22.74±0.27 (184)	32.11±0.34 (364)
Supplemented	12.21±1.03 (10)	16.51±1.40 (6)	25.80±0.49 (58)	32.94±0.59 (66)
Feeding group	NS	NS	**	NS
Male	10.94±0.64 (23)	16.41±0.96 (8)	25.52±0.34 (97)	33.95±0.55 (60)
Female	10.93±0.53 (29)	14.77±0.90 (7)	23.01±0.30 (145)	31.11±0.27 (370)
Sex	NS	NS	**	**
2004	10.98±0.70 (15)	16.59±1.02 (8)	52.27±0.31 (103)	34.68±0.42 (124)
2005	10.90±0.83 (37)	14..60±1.38 (7)	23.27±0.41 (139)	30.38±0.45 (306)
Year	NS	NS	**	**

Figures bearing different superscripts differ significantly; P≤0.01, NS: Non-significant.

through sale of surplus male lambs. Significant differences (P≤0.01) were also observed due to year. Lower weights were recorded during 2005, which could be due to poor availability of browsing resources. Body weight of hogget animals was higher during 2004. Similar observations were observed with adult animals despite non-significant difference among farmers groups. As a general trend live weights of all sheep classes were lower during 2005 compared to 2004, this could be due to higher number of animals (489 compared to 250), which decreased availability of browsing resources. Dass *et al.* (1999) reported lower body weight than present findings, whereas higher estimate of Magra yearlings under field conditions was observed by Murdia *et al.* (2003). Through interventions of new technologies and input in the form of medicines and timely vaccination; farmers showed interest in increasing their flock size, but due to continuous drought like conditions during the period, community pasture deteriorated and the grazing stock lost weight due to insufficient nutrients in the pasture, this could not be improved due to inability of farmers to purchase expensive fodder for supplementation.

The data revealed that feed supplementation did not affect body weight of suckling and the weaner groups; however it had significant (P≤0.01) positive effect on live weight of hoggets compared to non-supplemented group. Differences among adult stock maintained by farmers were non-significant probably because extent of supplementation was low, which could not manifest effects. Differences due to sex were non-significant among the suckling and weaner groups, however significant (P≤0.01) differences were observed among hogget and adult groups; males were heavier than females. This is in accordance with earlier reports where male androgens testosterone increased body weight during maturity period as compared to females. Similar observations were recorded due to year. The observations revealed that farmers preferably better manage the hogget stock as this is the major group contributing to their income through sale of animals.

The above observations revealed that live weights of animals were lower during 2005 compared to 2004, which was due to maintenance of higher number of animals and could also be due to lower availability of grazing resources in the common property resources. Supplementation had a positive effect on live weight of animals in the hogget group. Males had higher live weight than females. It could be concluded that farmers should be advised to supplement their livestock for better body weight gains and proper management of common property resources to improve forage availability.

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References

Dass, G., Singh, V.K. and Parthasarthy, S. 1999. Growth, wool production and wool quality parameters of Magra sheep under field conditions. *Indian Journal of Small Ruminants* 5: 55-58.

Harvey, W.R. 1990. Users guide for LSMLMW PC-1 Version: mixed model least squares and maximum likelihood programme. Iowa State University, USA.

Murdia, C.K., Ramani, R., Joshi, R.K., Yadav, S.B.S. and Chaudhary, V.K. 2003. Impact of selection in body weight at birth and yearling age in economic return from Magra flock at farmers level. *Indian Journal of Small Ruminants* 9: 92-95.

Shankar, V., Kumar, S. and Tyagi, R.K. 1988. Grazing resources of arid and semi-arid region. *Pasture and Forage Crop Research – A State of Knowledge Report*, pp. 63-85. 3rd International Rangeland Congress, New Delhi.

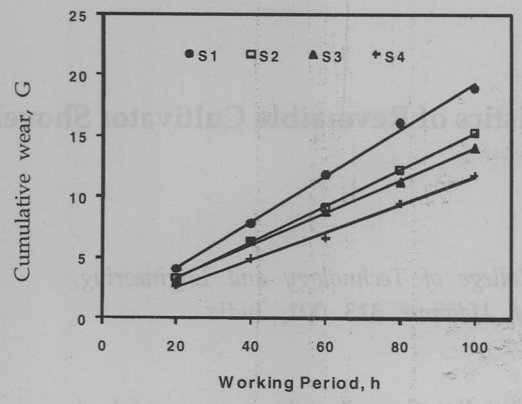

Fig. 2. Cumulative wear loss in shovels at different working periods

The wear pattern of the shovels revealed that all four types of shovel wore out along the thickness. The change in length and width was negligible. The decrease in thickness was maximum at the tip of the shovel as it was continuously in contact with the soil during operation. This may be due to the resultant of all the soil reactions acting around the tip of the shovel. The rate of wear was directly proportional to the magnitude of confining stresses. The confining stresses increased with the depth of operation of a shovel. Therefore the part of the shovel, which is close to the soil surface, would have minimum rate of wear. This result is in agreement with the findings of Singh and Thakur (1989) who observed that maximum wear took place at the tip of the shovel.

References

Kurchania, A.K. 1997. Abrasive wear of cultivator shovels as affected by soil, tool and operating parameters. *Ph.D. Thesis*, G.B.P.U.A.&T, Pantnagar.

Mahapatra, N. 2002. Wear characteristics of rotavator tynes for power tillers. *Ph.D. Thesis*, Indian Institute of Technology, Kharagpur.

Murthy, N.R.K.1987. Abrasive wear of cultivator shovel in soils. *Ph.D. Thesis*, Indian Institute of Technology, Kharagpur.

Raval, A.H. and Kaushal, O.P. 1990. Wear and tear of hard surfaced cultivator shovels. *Agricultural Mechanization in Asia, Africa and Latin America 21(2): 46-48.*

Singh, M.P. and Thakur, T.C. 1989. Studies on wear resistance of hard surfaced reversible shovels. *Journal of Agricultural Engineering (ISAE)* 26(3): *211-222.*

Singh, J., Singh, I. and Shukla, L.N. 1993. Wear characteristics of reversible shovels of seed-cum-fertilizer drill. *Agricultural Mechanization in Asia, Africa and Latin America* 24(4): *13-16.*