

Impact of breed improvement programme on goat production under farmers' flocks

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Population of Barbari goats is continuously declining in its home tract which has put this breed in endangered category (Singh and Rai 2006). Important reasons for decline in population are indiscriminate breeding due to lack of pure Barbari bucks and dilution with Sirohi breed of goats as Sirohi breeding bucks are available with large flocks and Sirohi goats are hardy for climatic, feeding and housing stress and perform better under grazing/browsing (Rai *et al.* 2009). Besides population, performance of these goats is also declining due to breeding with low potential bucks since males with good growth are sold without their replacement. Poor adoption of technology due to lack of knowledge is another reason of low performance. Therefore, to improve the goat productivity under farmers' conditions, it is necessary to provide quality germ plasm especially breeding male, support services (prophylactic measures, market for their goat and goat produces) and awareness on improved management practices.

The Central Institute for Research on Goats, Makhdoom (Uttar Pradesh) launched a multidisciplinary transfer of technology (TOT) programme in the home tract of Barbari goat ie Farah block of Mathura district of Uttar Pradesh in the year 2005. Villages Jalal, Bar Ka Nagla, Popa Burj and Pauri Sahjadpur were adopted under TOT programme on the basis of sizable goat population. Data on socio-economic attributes of goat keeper families, breed and flock composition, housing, disease status and management practices etc. were collected on structured schedule through conducting surveys. Later on 6 breeding bucks and 41 females of Barbari breed were provided to goat keepers of selected villages. Performance data on body weight, reproductive traits and service record of bucks were recorded by performing fortnightly visits and with the help of resource person.

Body weights of kids were recorded at an interval of 3 months with respect to breed/type, type of birth and sex by a dial balance. Goat keepers were motivated to adopt breeding

package of practices such as advantage of keeping purebred buck, awareness on criteria's and bases of males and females selection, disadvantage of inbreeding (goat keepers used a buck for 3–5 years and later on its progeny), proper age of first service, proper time of service (mid oestrus), care before and during late pregnancy and at the time of parturition, kidding in favourable seasons (climate and feeding resources), optimum interval for re-breeding etc. Besides personal visits; awareness camps, health camps, farmer's day etc were also arranged. Data on various traits were analyzed using appropriate statistical tools.

Socio-economic attributes: Number of Households were 127, 54, 102 and 202 in the village Jalal, Bar ka Nagla, Popa burj and Pauri Sahjadpur. Out of these households, 33, 28, 30 and 34 goat keepers in the corresponding villages were goat rearing (Table 1). Maximum goat rearing households belong to backward (74%) followed by schedule caste (22%) communities. Maximum goat keepers were marginal (59%), followed by landless (38) and small (3%) landholding category. Goat rearing was mostly (84%) practised as secondary source of income and contributes substantially (20–40%) of their total income. Present results were in agreement with the findings of Gokhale *et al.* 2002, Kumar *et al.* 2006 and Singh and Rai 2006. About 20–40% goat keepers also kept buffaloes. There were about 5–7% families in each village whose major source of income was from goats and their secondary sources of incomes were from crop farming and factory labour. Most of the (>55%) goat keepers were illiterate. Male kids were sold through middleman (butchers) between 5 and 9 months of age whereas females

Table 1. Goat population profile in adopted villages

Villages profile	Jalal	Bar Ka Nagla	Popaburj	Pauri Sahjadpur
No. of households	127	54	102	202
No. of goat rearing families	33	27	30	31
Average flock size	4.2	8.6	5.4	5.9
Range	1–16	1–12	1–12	1–14

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Table 2. Status of type of birth and service rendered by the institute buck

Village	Year	Institutes buck (%)	Village bucks (%)	Single (%)	Twins (%)	Triplets (%)
Jalal	2006–07	82.6	17.4	50.0	50.0	–
	2007–08	84.3	15.6	32.5	67.5	0.0
	2008–09	84.6	15.4	36.0	59.0	5.0
Bar ka Nagla	2006–07	52.0	48.0	35.2	54.0	10.8
	2007–08	70.0	30.0	47.2	45.5	8.3
	2008–09	68.0	32.0	30.0	58.0	12.0
Popa Burj	2006–07	57.7	42.4	32.3	67.7	–
	2007–08	56.0	46.0	37.0	53.0	9.0
	2008–09	74.3	25.7	32.0	57	11.0
Pauri Sahjadpur	2006–07	64.0	36.0	35.7	64.3	–
	2007–08	76.8	23.2	23.3	66.7	10.0
	2008–09	71.6	27.4	25.0	66.0	9.0

were mostly sold among goat keepers.

Goat management practices: The average flock size (including followers) was 4.2, 8.6, 5.4 and 5.8, respectively, in village Jalal, Bar Ka Nagla, Popa Burj and Pauri Sahjadpur, respectively (Table 1). Goats were maintained mainly on grazing however, grains were also provided in the form of *sani* consisted of wheat straw mixed with fermented crushed grains of barley or wheat. However, *sani* is provided to lactating or quality goats for a limited period in a year (40–100 days). Amount of concentrate varies from 50–250 g/head/day. The percentage of farmers rearing goats on stall-fed, low level of semi-intensive, moderate level of semi intensive and extensive feeding systems were 0, 7.7, 69.2, and 23%, respectively, in Jalal. Corresponding values were 4.1, 12.5, 29.1 and 45.8%, respectively in Bar Ka Nagla; 7.1, 17.9, 67.8 and 10.7%, respectively in Popa Burj and 7.1, 32.1, 50.0 and 17.9%, respectively in Pauri Sahjadpur. Weaning of kids continued till dam allowed the kids to suckle usually up to 4–6 months of age. Most of the flocks (75%) were provided inadequate housing space. The average open and covered housing space was 3 and 2 times lesser than the

normal requirements besides inadequate protection against inclement weather. The breed composition in terms of Barbari, Barbari type and non-descript goats was 10.8, 41.9 and 47.2%, respectively, in Jalal, 0, 7.6 and 92.4% in Bar Ka Nagla, 0, 22.7 and 72.3% in Popa Burj and 4, 27.6 and 68.4%, respectively in Pauri Sahjadpur, respectively in 2006 (Table 3). There was no buck in the village Jalal and Popa Burj and farmers were dependent on non-descript bucks of low potential of adjoining villages. PPR, ET, diarrhoea, pneumonia and internal parasitic infestation were major cause of morbidity and mortality. Diarrhoea and pneumonia together accounted for 82% mortality in kids in adopted villages.

Impact of breeding interventions: The bucks from Institute were provided to the goat keepers to extend services to 85, 68, 75.0 and 72% goat keepers in Jalal, Bar Ka Nagla, Popa Burj and Pauri Sahjadpur villages, respectively (Table 2). The impact of buck distribution over the years (from 2005–06 to 2008–09) resulted in an increase of Barbari type young kids from 42 to 92.3% in Jalal, from 0 to 30.82% in Bar Ka Nagla, from 23 to 68.18% in Popa Burj and from 31.6 to

Table 3. Breed composition of adult goats and in kids after buck distribution in the year 2005 in adopted villages

Village (s)	No of goat keepers	Year	Breed composition in adultgoats (%)			Breed composition in kids (%)		
			Barbari	Barbari type	Non descript	Barbari	Barbari type	Non descript
Jalal	26	2006–07	10.8	41.9	47.2	0.0	92.3	7.7
		2007–08	25.0	43.7	31.5	40.0	47.5	12.5
		2008–09	24.4	44.2	31.2	38.0	50.0	12.0
Bar Ka Nagla	26	2006–07	0.0	7.6	92.4	0.0	30.8	69.2
		2007–08	2.7	6.8	90.0	20.0	55.0	25.0
		2008–09	4.2	12.5	83.3	18.0	58.0	24.0
Popa –Burj	29	2006–07	0.0	22.7	72.3	4.5	68.2	27.3
		2007–08	3.6	25.4	70.9	6.8	62.0	31.0
		2008–09	7.8	29.2	63.0	11.6	62.6	26
Pauri –Sahjadpur	29	2006–07	4.0	17.6	78.4	12.0	60.3	27.6
		2007–08	5.0	22.5	72.5	10.5	68.4	21.0
		2008–09	11.4	27.5	61.1	18.2	63.8	18.0

72.4% in Pauri- Sahjadpur. The overall body weight of goats belonging to Jalal village was 2.63 ± 0.05 , 8.03 ± 0.15 , 14.90 ± 0.36 , 16.89 ± 0.81 , 19.43 ± 1.09 and 24.12 ± 0.51 kg at birth and 3, 6, 9, 12 and >18 months, respectively. The corresponding estimates in village Bar Ka Nagla were 2.90 ± 1.04 , 8.56 ± 0.79 , 13.83 ± 0.99 , 17.75 ± 2.03 , 23.33 ± 1.80 and 28.45 ± 0.89 kg, respectively; in Popa-Burj were 3.55 ± 0.09 , 8.86 ± 0.24 , 14.14 ± 0.35 , 17.95 ± 0.91 , 22.08 ± 0.73 and 30.11 ± 0.91 kg, respectively and in Pauri-Sahjadpur were 3.34 ± 1.54 , 8.73 ± 0.92 , 15.73 ± 0.95 , 22.51 ± 1.27 , 27.66 ± 1.88 and 29.64 ± 1.01 kg, respectively. Body weights of kids at different ages however, were less than the kids maintained at Institute flock under semi-intensive management system (CIRG, 2007). A significant increase was recorded in incidences of multiple births in every adopted village as a result of breeding with Institute buck. The incidences of overall multiple births increased from 42.8 (2005–06) to 64.7% (2008–09).

Barbari bucks distribution in its home tract was quite effective, quick and easily manageable intervention by goat keepers. Such intervention is also useful in mobilizing goats for breed oriented market and ultimately technological improvisation for maximization of production. Distribution of 1–2 Barbari bucks in each village depending upon goat population is very sustainable approach for the improvement and conservation of Barbari goats. Since Barbari goats are found in a very large area, more breeding farms should be established to cater to the need of elite bucks for field.

SUMMARY

Barbari, a highly prolific, dual purpose goat and highly suitable for commercial goat farming has come in endangered category of goat breed. Four villages of Farah block in Mathura district of Uttar Pradesh were selected for motivating farmers to adopt technologies in the form of germplasm and package of breeding practices. None of the village has purebred Barbari buck. Goats were maintained on grazing

with occasional supplementation of concentrate diet without any prophylactic measures. One or two Barbari bucks were provided in each adopted village which increased Barbari/ Barbari type of adult goats from 52.2 to 61.2% in Jalal, 7.6 to 10% in Bar Ka Nagla, 22.7 to 29.1% in Popa Burj and from 21.6 to 27.5% in Pauri Sahjadpur. The incidences of birth of Barbari/Barbari type kids in above corresponding villages were 87.5, 70.0, 69.0 and 78.9%, respectively. Buck supply also increased incidences of multiple births in adopted villages.

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