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Genetic improvement of native goats through up-grading with beetal bucks in Talagang-Punjab, Pakistan

Faisal Ashfaq[*1], M. Fatah Ullah Khan[2], Abdul Ghaffar[3], Aamir Bin Zahoor[4]

[1]*Animal Sciences Institute, National Agricultural Research Center, Islamabad, Pakistan*

[2]*Livestock and Dairy Development Board, Park Road, Islamabad, Pakistan*

[3]*Pakistan Agricultural Research Council Housing Society, Park Road, Islamabad, Pakistan*

[4]*Animal Sciences Division, Pakistan Agricultural Research Council, Islamabad, Pakistan*

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Abstract

Goats have special significance in Pakistan with total population 76.1 million heads. There are more than 30 breeds of goat in the country. The Beetal breed is very popular in Punjab and considered the most abundant breed in the province with large size and good milk production. This study was conducted in Talagang area, Chakwal district, Punjab. The inhabitants are mostly poor and rely on agriculture and livestock farming particularly sheep and goat rearing. For the up-grading of native goats in different villages, 12 Beetal bucks and 50 does were distributed in the community. One Beetal buck was given in each village for crossing with native goats to improve the local goat breed of the farmers. There were more than 200 beneficiaries under this activity. The birth weight of male Teddy crossbreds and Beetal were not different. Whereas birth weight of female Beetal has the highest weight (3.52±0.60kg) as compared to Teddy and Rulgud. Pre-weaning growth rate was highest in Teddy crossbreds (123.5 g/day) among the tested breeds while it was lowest in Beetal. The mortality was high in Beetal kids (12%) and lowest in Rulgud crossbred (3%). This indicates that Beetal goat was not adapted to the new environment compared to other Teddy and Rulgud crossbreds. The milk yield (1.25 Litre/day) of pure Beetal and Rulgud was similar. The study indicates that Beetal doe is not adapted in this area and the Beetal bucks may be distributed for crossbreeding purposes under this environment.

* **Corresponding Author:** Faisal Ashfaq ✉ ashfaq.faisal.pk@gmail.com

Introduction

Goat is a very valuable genetic resource of Pakistan. Goats contribute to the health and nutrition of several million people in Pakistan, especially those living on the poverty line. The current goat population is 76.1 million heads in the country (Anonymous, 2018). There are more than 30 breeds of goat in Pakistan. Among different breeds of goat Beetal, Dera Din Panah, Kamori, Kacchan and Damani are classified as dairy goat breeds. Among these breeds, Beetal is more popular in Punjab because of milk and meat production. As reported by Khan, 2001, the average milk yield of Beetal goat is 272 Liter in 140 days. The breed characteristics have been described by Hasnain, 1985 and Isani, 1996. Kamori is popular in Sind province and Damani in NWFP. In the rural areas of the country, goat provides important supply of animal proteins of high biological value plus essential minerals. Nevertheless, over a third of all goats in Pakistan are kept in Punjab. About half the rural households have traditionally been landless or in possession of marginal amounts of land (Haider, 1993). Teufel *et al.*,1998 reported that goat husbandry contributed more than 12% to the total agricultural gross margin in some areas of Punjab province. This study focused on Talagang which is an area in Punjab located in Chakwal district. The inhabitants are mostly poor and rely on agriculture and livestock rearing. For the up-grading of native goats in different village, Beetal bucks and does were distributed in the community.

Materials and methods

For the up-grading of native goats in different village, 12 Beetal bucks and 50 does were distributed in the community. One Beetal buck was kept in each village for crossing with native goats of the farmers. There were more than 200 beneficiaries of this activity.

Selection criteria for breeding buck

The following selection criteria was used for breeding buck selection: Strong, healthy with a well developed body, Broad head, thick and short neck with bright eyes, Free from any defect, Conform to the breed characteristics, Well developed and functional sexual organs with prominent testicles, Preferably a twin born, Age of buck should be between 1.5 to 2 years and Weight should be between 45-50kg.

Selection criteria for doe

The following selection criteria was used for doe: Healthy, Thin neck, Clear bright eyes, Well developed udder, soft and pliable with slightly forward pointed teats, Age should be 1 to 1.5 years, preferably pregnant. Weight should be between 30 to 35kg.

Economic production traits data recorded

The data on following production traits was recorded: Birth weight, Fertility rate, Kidding percentage, Litter size (Twinning and Triplet percentages), Weaning weight, Growth rate gm/day, Mortality percentage and Milk yield. Means and standard deviations were statistically computed (Steel and Torrie, 1980)

Interventions

The following interventions were introduced in project areas.

Number of goats (Beetal) introduced:	50
Number of Beetal bucks introduced:	12
Household receiving 1 goat each:	6
Household receiving 2 goats each:	22
Number of male buck receiving each village:	1
Number of villages:	10
Number of beneficiaries:	>200

Results and discussion

The project activities were implemented in the villages of Talagang area of Punjab province. The activities were started with interacting closely with all members of local communities, already established groups of women and initiating new ones with the help of women facilitators. Informal rapid appraisal using PRA techniques was conducted for qualitative understanding of farming system in the project area.

In order to collect quantitative information, semi structured questionnaires were used to interview community members. In the project area, large and small ruminant livestock are largely maintained on grazing. Some cultivated fodder, crop residues and

under special circumstances, some concentrates are used. Depending on season and physiological status, goats are supplemented with cut-carry tree leaves and concentrates. Breeding is largely uncontrolled-males are allowed to stay in herd/flock all year-round mating. The survey showed that in the project area most of the livestock related activities are undertaken by females. In the start of project activities, women facilitators from each village were giving training workshop about the goat husbandry and management. Five male buck are initially distributed among the community.

Table. Economic Production Traits of Different Goat Breeds.

Parameter	Goat Breed								
	Teddy			Beetal			Rulgud		
	First Year	Second Year	Average	First Year	Second Year	Average	First Year	Second Year	Average
Male birth weight (kg)	3.7±1.48(10)	3.9±0.92(11)	3.8±1.19	3.7±1.07(35)	3.77±0.92(40)	3.74±0.99	3.5±0.56 (95)	3.44±0.66 (111)	3.47±0.61
Female birth weight (kg)	2.4±0.92(10)	2.89±0.92 (14)	2.68±0.92	3.5±0.47 (24)	3.54±0.72 (26)	3.52±0.60	3.2±0.63 (71)	3.24±0.72 (75)	3.22±0.68
Male weaning weight (kg)	18.56±4.10(9)	18.8±3.96 (9)	18.68±4.03	16.07±4.08 (32)	16.20±4.08 (31)	16.13±4.08	17.91±3.66(93)	17.22±3.11 (38)	17.71±3.49
Female weaning weight (kg)	18.24±2.23 (9)	18.74±2.14 (7)	18.46±2.19	16.23±5.04 (22)	16.51±4.80 (22)	16.37±4.92	17.34±3.81 (69)	17.38±3.91 (65)	17.36±3.86
Male pre-weaning growth rate (gm/day)	123	124	123.5	103	104	103.5	120	115	117.5
Female pre-weaning growth rate (gm/day)	132	132	132	106	108	107	118	117	117.5
Fertility (%)	95	95.5	95.25	97	97	97	96	95.7	95.85
Kidding (%)	77	81	79	69	75	72	66	73	69.5
Mortality (%)	11	8	9.5	13	11	12	3	3	3
Twinning (%)		39		13	40	26.5		45	
Triplet (%)		6		13	4	8.5		3	
Milk yield (Liter)		0.75		1.25	1.25	1.25		1.25	

The birth weight of male Teddy crossbreds was 3.8±1.19 kg, Beetal 3.74±0.99 and Rulgud crossbred 3.47±0.61, there was no much difference in the average male birth weights of Beetal kids and Teddy crossbred kids. Whereas the female birth weight was highest in Beetal (3.52±0.60kg) as compared to other crossbreds. In Teddy crossbred it was 2.68±0.92 and in Rulgud crossbred it was 3.22±0.68kg. Whereas, the male pre-weaning growth rate was highest in Teddy crossbred (123.5 g/day) and it was lowest in Beetal (103.5 g/day) and it was 117.5 g/day in Rulgud crossbred. The female pre-weaning growth rate also adopted a similar trend being highest in Teddy crossbred (132 g/day) and lowest in Beetal (107 g/day) while it was 117.5 g/day in Rulgud crossbred. The male weaning weight was highest in Teddy crossbred kids (18.68±4.30 kg) followed by Rulgud crossbred kids (17.71±3.49kg) and Beetal kids (16.13±4.80kg).

The female weaning weight also followed a similar trend being highest in Teddy crossbred kids (18.46±2.19kg) followed by Rulgud crossbred (17.36±3.86kg) and Beetal (16.37±4.92kg). Highest fertility rate (97%) was achieved in Beetal does followed by Rulgud (95.85%) and Teddy (95.25%) while kidding percentage was highest in Teddy (79%) followed by Beetal (72%) and Rulgud (69.5%).

The twinning percentage was almost same in Beetal and Teddy does (40%) and somewhat higher for Rulgud does (45%). The triplet percentage was highest in Beetal (8.5%) followed by Teddy (6%) and Rulgud (3%). The mortality rate was high in Beetal kids (12%) followed by Teddy crossbred (9.5%) and it was lowest in Rulgud crossbred kids (3%). The milk yield data of Beetal and Rulgud does was 1.25 liter/day and in Teddy it was 0.75 liter/day. The milk yield of pure Beetal and Rulgud crossbreds was similar. The study indicated that Beetal goat was not adapted to the new environment compared to other crossbreds. Yet, it is more recommended to distribute bucks for crossbreeding purposes and not to maintain Beetal does for propagation under this environment.

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