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Production Performance and Economic Viability of Beetal Goats in Himachal Pradesh

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ABSTRACT

Goat is a multipurpose animal indispensable to small and marginal farmers across the world. In the present study the production performance and economic viability of Beetal goats was assessed in agroclimatic zone-I of Himachal Pradesh. A Beetal unit with five does and one buck was established at Krishi Vigyan Kendra, Kangra. The goats were reared in a semi-intensive system that integrated natural grazing with supplementary concentrate feeding. The surplus male and female goats were supplied as breeding stock. Over a five-year period, key production and reproductive parameters were recorded. The age at first kidding averaged 15.4±0.6 months, with kid birth weights ranging from 1.92 to 3.50 kg. The unit achieved an average kidding rate of 1.34±0.04 live kids per kidding across 23 successful kidding. Mature does and bucks weighed an average of 31.5±0.9 kg and 47.2±1.2 kg, respectively. Economic returns from sale of surplus goat varied from Rs. 26,600 to Rs. 155,450, with a total of Rs. 270,850 accrued over five years. The findings underscore the potential for Beetal goats to contribute to the diversification and sustainability of livestock farming in the region, suggesting that targeted development initiatives toward stationary and semi-intensive goat rearing could provide an effective alternative to declining traditional dairy cattle enterprises.

Keywords: Beetal, Breed, Goat, Performance, Production,Sustainability.

INTRODUCTION

Goats are highly adaptable animal and can be found in mostly all major parts of the globe (Arya *et al,* 2021). In Himachal Pradesh a north-western state of India, the goat population is about 11.1 lakhs (BAHS, 2019) and bulk of these goats (65%) are being reared under migratory/transhumance system and distributed in higher mountain areas with tough terrain like Chamba, Kangra, Mandi, Kullu and Shimla. In low mountain areas the goats are being reared in stationary/semi-extensive system where animals are provided shelter during night and taken for grazing locally during daytime (Singh *et al,* 2024). The goats in these units are non-descript with unreported or low production performance. In the mid-lower area goat population is around 35% most of which belongs to local goat population which are not yet registered, followed by admixture of Beetal/Sirohi and other indigenous breed procured by farmers or development agencies. Since, the Beetal goat is most prevalent as admixture population as well as purebred at few farmer's flock particularly in the lower hill area the propagation of Beetal can be appropriate in these regions. Further the part of lower hills especially the Shivalik region of Himachal Pradesh is part of old Punjab and region is adjoining to the breeding tract of Beetal, thus their propagation is within the frame of National policy. Further, the recent trends of livestock census and dynamics in state indicated decline in the cattle population owing to multitude of problems namely disposal of unproductive cattle, reproductive problem in crossbred, fragmentation of family and migration from villages to peri-urban areas.

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To some extent this sharp decline is filled by the goat as alternate to dairy cattle (although not sizeable yet but becoming popular) especially in the mid-hill to lower regions. The fact is also evident from temporal analysis of last five livestock census (1997-2019). The analysis revealed that the total population decline in livestock is 15.56% over the last five censuses with average yearly decline of 0.80% while in goat the total corresponding decline was only 5.1% over the last census and average yearly decline was 0.25% (Sankhyan *et al,* 2019; Dinesh *et al,* 2023; Anonymous, 2025). Thus, among livestock goat population only demonstrated somewhat stable trend over the census and recorded even growth between censuses. Although no systematic study has been done to analyze the decreasing trend of goat among migratory and stationary system, but indirect estimation through documentation of decreasing pastoralism (Sharma *et al,* 2022) indicates that stationary goat population may be increasing over the years. Therefore, development initiatives should be directed towards popularization of goat farming as stationary/semi-intensive which hitherto is neglected since the small ruminant farming in Himachal Pradesh is generally considered as pastoralism and institutional efforts are more directed towards migratory system. Recently there were initiative taken by government towards popularizing goat farming in lower hills, but evaluation and adaptability of breed introduced needs evaluation in different zones and production system to rationalize the propagation of goats. Keeping in view the above factors the present study production performance and economic assessment of Beetal goats an outstanding goat breed of neighbouring state, Punjab was assessed in agroclimatic zone I of Himachal Pradesh.

MATERIALS AND METHODS

A Beetal goat unit comprising of 5 does and 1 buck from its native breeding tract in Punjab were introduced at Krishi Vigyan Kendra, Kangra under Rashtirya Krishi Vikas Yojna in 2019. The animals were selected based on true to breed type characters and fulfilling the standard health and reproduction criteria. The goats were maintained under semi-intensive rearing system wherein the goats were led for grazing during daytime and housed overnight. Bushes and local grasses in pasture and field bunds constituted the primary grazing source for the unit. Sometime tree lopping was also provided to strengthen fodder availability to goats. Additionally, all the goats together were also provided about 1 kg concentrate as supplementary feeding. The surplus goats and kids from this unit were supplied as breeding stock to farmers and other agencies at the rate of Rs. 450 per kg live body weight for adult animals and Rs. 5000 per kid upto six months of age. The aged animals in the unit were also culled and supplied for meat purpose at the rate of Rs. 250 per kg live body weight occasionally. One labour was engaged every day for grazing of goats along with cattle from dairy unit of Krishi Vigyan Kendra. The data generated was analyzed for descriptive statistics using statistical package SPSS version 16.0.

RESULTS AND DISCUSSION

Age at first kidding

The female kids born at the Kendra, delivered their first kidding in the age ranging from 13 to 19 months with an average of 15.4±0.6 months. The average age of first kidding has been reported from 17.4 (Ahmad *et al,* 2007) to even higher range of 20 to 22 months (Dhara *et al,* 2020). The relatively lower age of 15.4±0.6 months observed in the present study may be due to rearing of all the goats across all age groups and sex together in one room which offered more opportunities for mating in the goat flock. In the current rearing system, the effect of bio stimulation and greater excess to male may also have influenced the age at first kidding (Landaeta-Hernández *et al,* 2023)

Kid birth weight

The birth weight of kids ranged from 1.92 to 3.50 kg. The birth weight was higher when the number of kids born per kidding was only one and it ranged from 2.4 to 3.5 kg while it was lower when twinning or tripling per kidding was observed. Birth weight of Beetal kid or any other animals is linked to heredity and nutrition of dam especially during pregnancy. The birth weight of Beetal goat has been reported to vary in different areas and ranged from 2.9 to 3.6 kg (Afzal *et al,* 2004). In the present study the area is totally rain fed so the prevalent vegetation may be less succulent and nutritious. Additionally, provision of separate feeding of pregnant does was not available so the birth weight of kids in the present study may be lower. This is further supported by the fact that higher birth weight was observed in some of the farmer's flock which procured breeding stock from the KVK unit, where resource utilization was optimum. Additionally, lower age at first kidding may have also caused lower kid birth weight in the present study. Soundarajan *et al* (2006) has also reported that the goats which have lower adult weight tend to give birth to kids with lower birth weight.

Table 1: Year wise sale of Beetal goats and revenue generated at KVK Kangra

Year	Number of animals Sold	Revenue generated (Rs)
2020	0	0
2021	2M, 4F	26600
2022	3M	46800
2023	2M, 2F	42000
2024	2M, 6F	155450
Total	21	270850

(M = male and F = Female)

Table 2: Input cost, revenue generated and benefit cost ratio of Beetal goat unit

Sr. No.	Particulars	Amount (Rs)
1	**Input cost**	
a	Cost of initial goat unit	62000
b	Cost of labour, one third of a manday @ Rs 350/day	212917
c	Cost of feed, 1 kg/day @ Rs 24/kg	43800
	Total	318717
2	**Revenue generated**	
a	Sale of goats	270850
b	Capital accrued/available at the end of 2024: 16 goats (1 M, 6 F and 9 kids)	151375
	Total	422225
3	**Benefit cost ratio**	1.32

Kidding rate

At this unit a total 23 successful kiddings took place, and 31 live kids were born and added to the flock over the five-year period from 2020-2024. The average number of live kids born per kidding was 1.34±0.04 The number of kids born per kidding has been reported to be around 1.76 in their native tract of Gurdaspur and Amritsar (Tantia *et al,* 2001). The lower number of kids per kidding (1.34+0.04) observed in the present study can attributed to relatively longer cold climatic conditions of the hilly regions of Kangra, Himachal Pradesh and high annual rainfall (which favours high incidence of parasite infestation), lack of nutritious fodder especially during winter season and poor forages in the pasture area. These reasons may have affected the reproductive aspect of Beetal goats in the area.

Mortality

Mortality in kids and adult during the study period was around 12% for kids and 2.7% in adults. Among kids' mortality was more which were born as part of twinning or tripling. The primary reason for mortality was poor nursing by weak mothers especially when the number of kids born per kidding was more. These weak kids owing to poor nutrition had low immunity so easily succumbed to diseases like diarrhoea and pneumonia. Additionally, some kids also died due to injury or attack by adult buck owing to common overnight shelter. Separate housing for young kids and breeding bucks may be helpful to overcome these losses.

Health

In adult goats incidence of premature kidding and apparently caseous lymphadenitis was also observed. Premature kiddings may be due to poor nutrition due to limited concentrate supplementation and grazing resources especially during lean season. Honparkhe *et al* (2017) has also reported premature kiddings in Beetal goats due to ingestion of goitrogenic fodder though such lesions were not apparent in the

present study. The caseous lymphadenitis in the flock need further investigation as the disease also has zoonotic implications and is not commonly observed in local goats in Himachal Pradesh.

Adult body weight

The mature body weight recorded at the unit ranged from 26 to 37 kg with an average of 31.5±0.09 kg for adult females and 39 to 54 kg with an average of 47.2±1.2 kg for males. Average adult body weight of Beetal goats has been reported about 34 and 59 kg for female and male (Tantia *et al,* 2001) respectively. The lower body weight in the present study indicated lower plane of nutrition in the region. It may be due to shorter grazing period or poor food resources in the local area. Additionally, the present area *i.e.,* Kangra has longer winters compared to native tract so the maintenance requirements of the animals may be higher causing lower mature body weight across both sexes.

Economic returns

The annual revenue generated from sale of goats ranged from Rs. 26600 to Rs. 155450 as shown in table 1. The total revenue accrued over the five years was 270850 with an average of Rs 54170 per annum. Ravi *et al* (2022) has also reported a net income of Rs. 56920 from a unit of 10 goats annually, which is little lower than that observed in the present study. Beside it 16 goats (1 adult male, 6 adult female and 9 kids) were still available at Kendra by the end of this period. As Beetal goats are reared primarily on grazing and a flock of upto 20 animals can be effectively managed by family labour without engaging additional unskilled labour. The average per capita income in Himachal Pradesh is Rs. 235199 (Economic survey, 2023-24). So, an additional annual earning of Rs. 54000 for a small or marginal farmer, can make a significant addition to his/her income. Besides the goats are reared by people from low-income group so addition of such goat unit in a household may help them to cross the poverty line and improve their socio-economic status.

Benefit cost ratio

Table 2 shows the input cost, revenue generated and benefit cost ratio of Beetal goat unit at the KVK Kangra. The cost of buying the initial goat unit of 5+1 was Rs. 62000. On an average about 1 kg concentrate feed (Rs. 24/kg) was offered to goats daily. Since no labour or worker was deputed exclusively for goat unit and only one labour was deputed for grazing of goats and cows being reared at Krishi Vigyan Kendra so only one third of a manday @ Rs. 350/daily was used as labour cost. The total cost of production of goat unit for five years turned to be Rs. 318717. So, the benefit cost ratio for goat unit over the five years period is 1.32 indicating good returns. The milk produced by Goats was primarily used for nursing of kids and surplus milk was also collected but not recorded. Similarly, the cost of health care, forages grazed, and manure produced by goats was not included. The goats were sold primarily for breeding purpose, so the selling price as breeding stock was higher and may be the main reason for good benefit cost ratio in the present study.

CONCLUSION

Beetal goat performed satisfactorily in agro-climatic conditions of Kangra and owing to good growth and adult body weight can significantly contribute to income of small and medium farmers in low mountainous areas in the state of Himachal Pradesh. Further the study will serve as reference base line scientific evaluation for wider propagation of Beetal goat through institutional efforts in the lower hill region of Kangra districts and geographically similar region in other districts.

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