



ISSN (E): 2277- 7695  
ISSN (P): 2349-8242  
NAAS Rating: 5.23  
TPI 2022; SP-11(2): 738-741  
© 2022 TPI  
[www.thepharmajournal.com](http://www.thepharmajournal.com)  
Received: 19-12-2021  
Accepted: 22-01-2022

**Jaswant Kumar Regar**  
Ph.D. Research Scholar,  
Division of Livestock Production  
Management, ICAR- National  
Dairy Research Institute,  
Karnal, Haryana, India

**Arun Kumar Misra**  
Principal Scientist and Head,  
Division of Livestock Production  
Management, ICAR- National  
Dairy Research Institute,  
Karnal, Haryana, India

**Anil Kumar Dixit**  
Principal Scientist, Dairy  
Economics Statistics &  
Management Division, ICAR-  
National Dairy Research  
Institute, Karnal, Haryana,  
India

**Corresponding Author**  
**Jaswant Kumar Regar**  
Ph.D. Research Scholar,  
Division of Livestock Production  
Management, ICAR- National  
Dairy Research Institute,  
Karnal, Haryana, India

## Economic evaluation of Barbari goats under integrated farming system

Jaswant Kumar Regar, Arun Kumar Misra and Anil Kumar Dixit

### Abstract

Goat plays an important role in the sustainable livelihood of poor people in all agro-climatic regions of India. The rearing of 10 goats under integrated farming system (1.0 ha land) turned out to be economical viable with annual net benefits of INR 1.93 lakh and benefit cost ratio of 2.49, found to be befitting enterprise in small holder production system. The goat herd size has increased from 10 to 34 with 62.50% single birth, 31.25% twinning and 6.25% triplets for a period of one and half year.

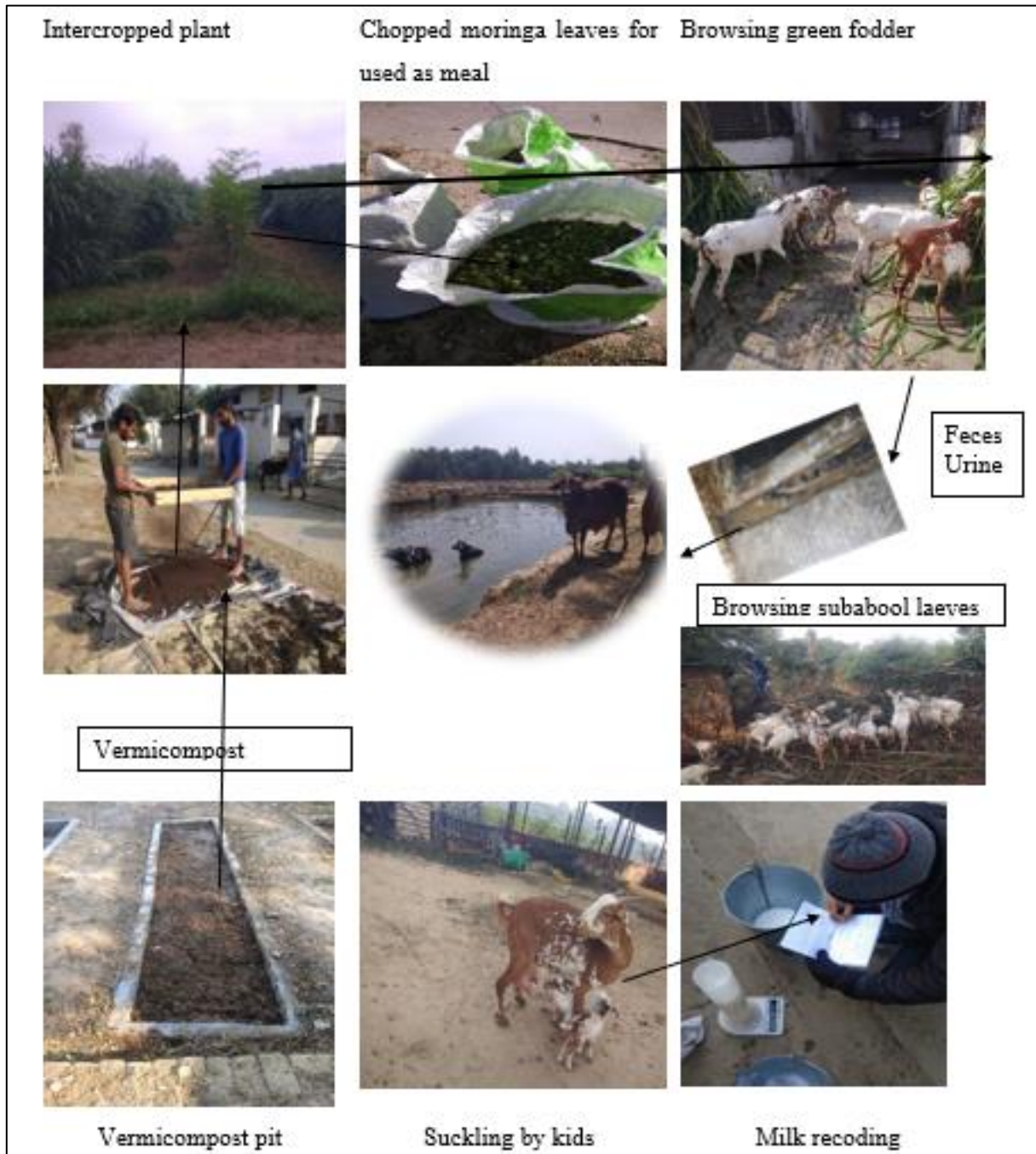
**Keywords:** farming system, goat, B: C ratio

### Introduction

India ranked first position in terms of goat population with 148.88 million as per 20<sup>th</sup> Livestock census with total milk production of 209.9 million during 2020-21 (Economic Survey, 2021) [8]. The goat milk contributes 3% of total milk production in India (DAHD, 2019) [2]. Goat is known as “Poor Man’s Cow” as they help in fulfilling household’s emergency cash needs and best utilization of family labour. Farmers with less than 2 ha of land (marginal and small) possess more than 76% of goats in the country (Dixit *et al.*, 2017) [5]. They have lower feed and capital requirements than larger species, making them suitable to smallholder production system (Devendra, 2002) [4] and playing a pivotal role in sustaining livelihood and nutritional security of resource poor people particularly in economic and climatic disadvantageous regions of India (Singh *et al.*, 2013). Goat acts as a cushion in distress situations like drought, famine and pandemic like COVID. Goat rearing provides glimpses of future hope for self-employment, nutritional security and prosperity to millions of small and marginal farmers including landless labourers and worker in the country. Keeping this in view, the present study was conducted to assess the economic evaluation of Barbari Goats under integrated farming system (IFS).

### Material And Methods

The present study was conducted at ICAR-National Dairy Research Institute, Karnal in the IFS unit from September, 2020 to February, 2022 (18 months). The IFS unit is located at 29° 43' N latitude and 76° 58' E longitudes at an altitude of 245 meters above mean sea level (MSL) in the Trans Indo-Gangetic plain of India. The project is laid on an area of 1.00 ha with different sub-components viz., crop production (0.4 ha), fodder production (0.4 ha), dairy production (cattle-3; buffalo-3, goats-10), poultry farming (40 birds), fish pond and vermin-compost pits, Nursery etc. (0.2ha). Ten Barbari goats were procured from ICAR-CIRG, Makhdoom, Mathura in September 2020 and integrated in farming system project. Goat unit was maintained under semi-intensive system. A floor space of 300 sq. ft. (30 x 10 feet) as per the recommendation (1.5 to 2.0 sq. mt. per goat) was provided under semi-intensive system (Ramachandran *et al.*, 2017) [15]. The goats were housed on pacca shed having concrete floor during night times and kept outside on kaccha floor during day times. On an average 2-3 kg green fodder was provided to each goat after chopping to reduce the wastage round the year as per availability. Concentrate feed @ 200-300g/head/day was provided to meet the nutrient requirement as per ICAR, 2013. The urine and washing of the goats’ house were recycled to fish pond and dung was used for making compost (Fig.1). Goats were milked daily during morning and evening times. The various cost concepts were used to calculate the contribution of goats in the farming system.



**Fig 1:** Production performance of Barbari Goats in integrated farming system.

**Table 1:** The performances of Barbari goats at IFS unit in NDRI

Months	No. of Female goats	No. of kids born		Total kids	Birth weight (kg)
		Male	Female		
September	10	0	1	1	1.86 (F)
October	10	0	0	0	
November	10	0	0	0	
December	9	2	0	2	1.90, 1.88 (M)
January	9	1	0	1	1.98 (M)
February	9	0	0	0	
March	9	1	5	6	1.83, 1.80, 1.86, 1.85, 1.82(F), 1.93(M)
April	9	0	0	0	
May	9	0	0	0	
June	9	0	0	0	
July	9	0	0	0	
August	9	0	0	0	
September	9	0	0	0	
October	9	0	0	0	
November	9	0	0	0	

December	10	6	6	12	1.96, 1.95, 1.92, 1.95, 1.94, 1.87, 1.90(M) 1.83, 1.87, 1.89, 1.84, 1.85, 1.86 (F)
January	11	1	0	1	2.05 (M)
February	11	0	0	0	
Total	11	11	12	23	1.84 (F), 2.11(M)

### Results And Discussion

The results of Table 1 shows that the total number of goats was increased from 10 to 34 with 62.50% single birth, 31.25% twinning and 6.25% triplets during experimental period. The Average percentage of kidding during experiment was 76.36% (Table. 2). The daily milk yield, monthly milk yield and total milk yield was recorded as 9.0 l, 270.00 l and 4860.00 l, respectively. Average milk yield per goat per day was 0.9 liters/day. Total manure yield was 64.00 kg/goat.

Birth weight of male and female kids were 2.11 and 1.84 kg, respectively. Even though male kids weighed 14.6% higher birth weight than female kids, there was no significant difference observed. Das *et al.* (1989) [3] reported that the birth weight of male kids of Barbari were higher than female

kids. Similar results were also observed by Singh *et al.* (1983) [16].

The results on economic returns showed that the gross returns from goats were 3, 21,910.00 INR and net profit were 1, 92,990.00 INR per year. The overall contribution of goats integrated farming system was 19.35% with benefit cost ratio of 2.49 (Table. 3). Apart from this, residues/ waste recycling has clearly brought out the possibility of linking dairy goats in integrated farming system. The major portion of the income generated was attributed to the sale of milk. The cost of milk production reduced considerably as diet requirement of animals was met by the fodder and crop residues produced in the system. The generation of employment further makes the dairy goat unit a positive linkage in integrated farming system.

**Table 2:** Kidding and twinning percentage of Barbari goats

Phase/cycle	No. of Female	No. of Kids born	Kidding %	Single	Twins	Triplet	Total	Twinning %
I <sup>st</sup>	10	8	80.00	6	2	0	8	25
II <sup>nd</sup>	11	8	72.72	4	3	1	8	37.5
Average kidding percentage			76.36	10	5	1	16	31.25
Type of kidding (%)				62.50	31.25	6.25		

**Table 3:** Cost benefit analysis of Barbari goats as a component of IFS.

Economics of Dairy Goats			
1. Goats unit production costs= (Fixed + Recurring)			
a) Fixed cost:			
i) Purchase cost of the goats:	Rate per animal (Rs.)	No. of animals	Amount (Rs.)
Goat (Barbari)	5000	10	50,000.00
ii) Building cost			60,000.00
iii) Miscellaneous expenditures			1,000.00
2. Total Fixed cost (a)			1,11,000.00
b) Recurring expenditure:			
i) Production ration	Rate (Rs. /kg)	Quantity (kg)	Amount (Rs.)
a. Concentrate mixtures			
@ 0.3kg/day/animal x10 animals x 380 days @ Rs 18/kg	18	1140	20520.00
ii) Dry period ration			
@ 0.250 kg/day/animal x 10 animal x 160 days x Rs.18/kg	18	400	7200.00
b. Dry fodder/straw			
@0.3 kg/day/animal x 10 animal x 540 days x Rs. 500 /quintal	5	1620	8100.00
c. Green fodder			
@3.0 kg/day/animal x 10 animals x 540 days@ Rs. 2/kg	2	16200	32400.00
d. Medicines and other miscellaneous (Rs. /animal)	100	10	1000.00
e. Labour charge (man-days)	250	150	37500.00
3. Total recurring cost (b)			106720.00
c)			
a. Interest on fixed investment	@10% p.a		11100.00
b. Depreciation cost of total fixed cost	@10% p.a.		11100.00
Total ©			22200.00
5. Total Production Cost (b+c)			128920.00
6. Income:			
a. Milk production	50	4860.00	243000.00
b. Manure	10.00	960.00	9600.00
d. kids	Rs.3000/kid	23	69000.00
e. Gunny bags	Rs. 10/ bags	31	310
7. Gross returns			321910.00
8. Net Profit (Gross returns - Cost of production)			192990.00
9. B:C ratio			2.49

The contribution of the goat unit to the farming system in terms of productivity was found to increase over the time. The better net returns were experienced due to improved milk productivity and Barbari breed has capability of producing high kidding pattern of twins and triplets. Similar findings were observed by Kharkar *et al.* (2014) <sup>[12]</sup> and Kakar *et al.* (2013) <sup>[11]</sup> reported kidding pattern in Berari goats, which had 59 percent twinning rate and 2.11 per cent triplets. The goat farming offers immense opportunity for income and employment generation of land less, poor and weaker section of society. Similar work related to the present investigation was also carried out by Prasad *et al.* (2013) <sup>[14]</sup> and Singh *et al.* (2011). The overall benefit: cost ratio was observed as 2.24. Our results commensurate with the finding of Dixit and Singh, 2014; Dixit and Mohan, 2014 and Singh *et al.*, 2011 <sup>[18]</sup>. Similar findings have also been documented by Ashok Kale (2000) <sup>[1]</sup>, Jayanthi *et al.* (2002) <sup>[9]</sup>, Legesse *et al.* (2008) <sup>[13]</sup> and Jayanthi *et al.* (2009) <sup>[10]</sup>.

### Conclusion

Inclusion of Barbari goats under IFS model is found profitable enterprise. This can be promoted in the smallholders' production system for enhancing their income and employment.

### Acknowledgments

The authors are thankful to Dr M.S. Chauhan, Director and Head, LPM, ICAR-National Dairy Research Institute, Karnal for providing guidance, infrastructure and necessary support to carry out the research work.

### References

- Ashok Kale N. Goat farming - A remunerative enterprise. *Intensive Agric.* 2000;24(2):24.
- DAHD, Basic Animal Husbandry Statistics 2018–19. Department of Animal Husbandry and Dairying, Government of India, New Delhi, India. 2019.
- Das N, Joshi HB, Bisht GS. Pre weaning body weights and linear body measurements in Barbari and Jamunapari kids under intensive management system. *Indian J. Anim. Sci.* 1989;59(11):1450-1454.
- Devendra C. Crop animal systems in Asia: Implications for research. *Agric. Syst.* 2002;71:169-177.
- Dixit AK, Singh MK, Das G. Small ruminant farming and livelihood security in India: Present status and opportunities for enhancing farmers' income. *Curr. Advanc. Agri. Sci.* 2017;9(2):252-61.
- Dixit AK, Mohan B. Economics of goat production in Mathura district of Uttar Pradesh, *Indian J. small ruminants.* 2014;20(2):96-98.
- Dixit AK, Singh MK. Economic analysis of goat rearing under field conditions of Bundelkhand region, *Indian J. small ruminants.* 2014;20(2):165-168.
- Economic Survey, Ministry of Finance, Govt. of India, New Delhi, 2021-22;7:251-252.
- Jayanthi C, Mythili S, Chinnusamy C. Integrated farming systems - A viable approach for sustainable productivity, profitability and resource recycling under lowland farms. *J. Ecobiol.* 2002;14(2):143-148.
- Jayanthi C, Vennila C, Nalini K, Chandrasekaran B. Sustainable integrated management of crop with allied enterprises; Ensuring livelihood security of small and marginal farmers. *Tech. Monit.* 2009, 21-27.
- Kakar Z, Ali I, Kausarzeb, Shah ZA, Haq IU, Rafiuallah Hussain T *et al.* Production patterns of sheep and goats in district Qila Abdullah (Balochistan). *J. Anim. Plant Sci.* 2013;23(1):35-38.
- Kharkar K, Kuralkar SV, Prajakta K. Growth, production and reproduction performance of Berari goats in their native tract. *Indian J small ruminants.* 2014;5(3):115-122.
- Legesse G, Abebe G, Siegmund-Schultze M, Valle Zarate A. Small ruminant production in two mixed-farming systems of southern Ethiopia: Status and prospects for improvement. *Exp. Agric.* 2008;44:399-412.
- Prasad R, Singh AK, Singh L, Singh A. Economics of goat farming under traditional low input production system in Uttar Pradesh. *Indian Res. J Extn. Edu.* 2013;13(2):62-66.
- Ramachandran N, Pourouchottamane R, Singh SP, Kumar V, Rai B, Singh MK *et al.* Shalter layout plans and requirements for small and medium scale goat farms. ICAR-CIRG, Maakhdoom. U.P. 2017.
- Singh A, Yadav NC, Sengar OPS. Factors affecting body weight at birth and weaning in Jamunapari and Barbari kids. *Asian J. Dairy Res.* 1983;2(1):55-58.
- Singh MK, Dixit AK, Roy AK, Singh SK. Goat rearing: A pathway for sustainable livelihood security in Bundelkhand region. *Agri. Eco. Res. Rev.* 2013;26:79-88.
- Singh SP, Singh AK, Prasad R. Economics of goat farming in Agra district of Uttar Pradesh, *Indian Res. J. Ext. Edu.* 2011;11(3):37- 40.