



Enhancing Profitability of Buffalo Production System by Rearing Male Calves

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ABSTRACT

Buffalo meat is the healthiest meat because of lower intramuscular fat, cholesterol and calories, higher in essential amino acids contributing 50 per cent in Punjab's and 19.61 per cent in India's meat production. About 1,324 thousand tonnes (91.22%) of buffalo meat worth Rs 26,162 crore was exported during 2016-17. Punjab produces 8.58 per cent of India's buffalo meat with only 4.75 per cent buffalo population. With breedable population of 27.87 lakh and 8.4 lakh male calves every year, 8400 units in Punjab with unit size of 100 male calf each are proposed resulting in additional 2.31 lakh tonne meat /year worth Rs 2,310 crore besides self employment of 8,400 persons and employment to 16,800 labourers. From a unit of 100 male calves, the annual net return will be Rs 5.25 lakh and monthly income will be Rs 43,750 and benefit cost ratio will be 1.29 which is quite high than one indicating that the business is secure and viable.

Key Words: BC ratio, Entrepreneur, Model, Mortality, Net returns, Variable cost.

INTRODUCTION

Livestock sector contributes about 26 per cent of the total gross domestic product (GDP) from agricultural sector in India. Livestock sector plays an important role in Punjab agriculture as evidenced from its contribution to the total agricultural GDP which was recorded at 36 per cent during 2016-17 and continuously improving over the time (Anon, 2017). During the last five years, the growth rate of livestock sector is observed to be 5.05 per cent as compared to only 0.46 per cent in crop sector.

Punjab is leading milk producing state in the country with highest milk production per animal both in cross bred cattle (12.44 l/day) and buffaloes (8.30 l/day). India has 108.7 million buffaloes and 190.90 million cattle (Anon, 2014). The cross breeding has helped the country a lot in enhancing the milk production and becoming number one milk producer in the world. In India, the number of cross bred cattle has increased from 20.10 million during 1997 to 39.73 million during 2012

which is 20 per cent of the total cattle population in the country. Sharma (2013) reported that very few farmers were practicing dairy business on commercial scale (2.4%) and majority of farmers (93.3%) were having up to 15 animals. Further, it was also noticed that dairy farmers (74.9%) were possessing cows with daily milk yield varying from 4 to 10 l./d and 85.8 per cent of farmers were keeping buffaloes with daily milk yield ranging between 2 to 8 l./d. Major problems of the small dairy farmers were cow dung management while for semi commercial and commercial farmers mastitis was the major problem. Further, Sharma (2015) revealed that poor knowledge about the nutritive value of feed ingredients (86.5%), high cost of raw feed ingredients (28%), shortage of skilled and committed labour (32.5%) were found to be major bottlenecks regarding adoption of cattle feed formulation technology at the dairy farm. However, education level helped in acquiring the knowledge but adoption was found to be less in highly educated persons (Sharma, 2016).

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Punjab state has 24.28 lakh cows, out of which 85 per cent are cross bred cows. On the other hand, there are 51.60 lakh buffaloes and buffalo being the native animal, is well adapted to the local climatic conditions and resistant to various diseases and parasites. Contribution of buffalo milk to the total milk production of the state is about 72 per cent as compared to 49 per cent at National level. The milk contributes about 81 per cent of the value of output from livestock sector and out of that 81 per cent, a major part (about 80 %) is contributed by buffalo milk and only 20 per cent is contributed by cow milk (Anon, 2018). Besides milk contribution, buffalo is most suitable for meat production and hence generating additional income and employment in the state. The potential of buffaloes can be realized though the sale of unproductive animals for meat which is accepted socially and religiously unlike cow meat. There is no such issue of disposal of unproductive animals and male calves in the case of buffaloes and hence no issue of stray buffaloes (Kaur and Singh, 2018).

MATERIALS AND METHODS

The required data related to livestock population, GDP share, growth rate etc has been compiled from various published secondary sources. The data required for buffalo male calf rearing model has been compiled and calculated by the authors at their own level by considering various assumptions on scientific grounds which are given below.

Assumptions

- Shed construction: Covered space @ 24 sq feet/calf (@ Rs 500/sq feet)
- Depreciation on shed @ 4%/annum
- Cost of equipments and chaff cutter @ Rs 25,000/- each
- Depreciation on equipment and chaff cutter @ 10 %/annum
- Interest on capital investment @ 10 %/annum
- Purchase of 3 m old male calf with 50-60 kg weight @ Rs 3000/-

- Green fodder (per calf)- 5 kg for 3 m, 12 kg for next 6 m, 20 kg for next 3 m
- Dry fodder (per calf)- nil for 3 m, 2 kg for next 6 m, 3 kg for next 3 m
- Concentrate feed (per calf)- 0.5 kg for 3 m, 1 kg for next 6 m, 2 kg for next 3 m
- Labour- 2 labourers @ Rs 9000/month plus own labour
- Vet expenses @ Rs 300/calf on an average
- Miscellaneous (Light, water, repair etc)-Rs 2000/month
- Sale of 100 calves at the age of 15 m with 300 kg live weight @ Rs 75/kg
- Total manure 255.5 t(@7 kg per calf for 365 d for 100 calves) sold @ Rs 400/t
- No mortality is assumed after purchase of three months old male calf. 10 per cent mortality was assumed before the age of 3 m.

RESULTS AND DISCUSSION

Contribution of livestock sector

In Punjab, the contribution of livestock sector to agriculture and allied GDP increased from Rs 7,698 crore (29 %) during 2000-01 to Rs 37,415 crore (36.01 %) during 2016-17 (Table 1). Livestock sector in addition to regular income, provides house hold nutritional security and employment to small and marginal rural households. This regular source of income has a huge impact on minimising risks to income as income from crop sector is seasonal. Moreover, livestock is a security asset to be sold in times of crisis. It absorbs the surplus family labour of the farmers and thus helps in earning extra income throughout the year. The farmers are intrinsically linked to dairy farming to produce milk and milk products for home consumption and for subsidiary income.

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Table1. Share of livestock in agricultural GDP over time. (Rs Crore)

Year	Total Agri.GDP including fisheries	Crop GDP	Per cent share of crop GDP	Livestock and Fisheries GDP	Per cent share of Livestock and Fisheries GDP
1980-81	2423.5	1696.42	70.00	727.08	30.00
1990-91	8253.67	6116.01	74.10	2137.66	25.90
2000-01	26635.32	18751.21	70.40	7884.11	29.60
2010-11	63805.2	44573.37	69.86	19231.83	30.14
2015-16	92818.25	59526.48	64.13	33291.77	35.87
2016-17	103904.26	66489.36	63.99	37414.99	36.01

Source: Statistical Abstract of Punjab, various issues

Growth rate of Agricultural and livestock GDP

In Punjab State, agriculture economy is now a days in crisis due to stagnation in growth, decline in real farm incomes and over-exploitation of natural resources i.e. soil and water. In the current scenario, livestock enterprises especially dairy, fishery, pig farming, goat farming and poultry are the remunerative subsidiary occupations providing regular flow of income and employment particularly to small and marginal farmers. Within the livestock sector, milk is the major contributor to total value of output from this sector with as high as 82.17 per cent contribution in Punjab and 67.14 per cent at national level (Table 2). Meat is the next major contributor with 11.62 per cent and 20.81 per cent in Punjab and India respectively. Within the milk group, buffaloes contribute about 80 per cent value of output and remaining 20 per cent by cows in Punjab.

Buffalo and Cattle population in Punjab

Table 3 presents the buffalo and cattle population over time in India as well as Punjab. It has been observed that the share of cross bred cattle to total cattle in 2003 was 72.99 per cent only, declined to 71.47 per cent in 2007, and rose to 85.05 per cent in 2012.

Total buffalo population decreased by 1.16 per cent during the above period. The buffalo population during 2012 was 51.6 lakh in Punjab which is 68 per cent of the total dairy animal population of the state. Hence, it signifies the importance of buffaloes in livestock production system of Punjab.

Buffalo male calf rearing model for Punjab

There are 27.87 lakh breedable buffaloes in Punjab state and produces 18.67 lakh calves with 67 per cent breeding efficiency. Approx. 8.4 lakh male calves are supposed to survive after 10 per cent mortality and assuming 50:50 male female ratio. 8400 units in Punjab with unit size of 100 male calf each are proposed resulting in additional 2.31 lakh tonne meat /year worth Rs 2,310 crore besides self employment of 8,400 persons and employment to 16,800 labourers. All these calves have the potential to grow to 300 kg as an average live body weight at age of 15 m. With initial capital investment of Rs 12.5 lakh, male calf rearing unit of 100 calf size can be started (Table 4). The three month old purchased calves will be reared one year i.e. up to the age of 15 m. The total fixed cost for one year will be Rs 1.78 lakh and total variable cost for the same period will be Rs 16.49 lakh. The total cost of rearing 100 male calves for one year will be

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Table 2. Contribution of various components of livestock sector to value of output during 2015-16 (Rs Lakh)

Sr. No.	Particulars	Punjab	India
1	Livestock	41,23,400	8,35,15,700
2	Milk	33,88,500(82.17%)	5,60,77,700 (67.14%)
3	Eggs	1,23,900 (3.00%)	26,27,400 (3.14 %)
4	Meat	4,79,400 (11.62%)	1,73,84,000 (20.81 %)
5	Dung	98,400(2.38%)	48,45,100 (5.80 %)
6	Crop sector	71,28,400	16,39,52,300
7	Food grains	50,96,100	5,26,72,200
8	Rice+Wheat	50,17,100	3,74,01,800

Source: State wise and item wise estimates of value of output from agriculture and allied sectors, Govt of India.

Table 3. Buffalo and cattle population in Punjab, 2003-2012 (In million)

Sr. No.	Category	2003	2007	2012
1	Cattle	20.99	17.63	24.28
2	Total crossbred cattle	15.31 (72.99)	12.60 (71.47)	20.65 (85.05)
3	Males	2.74	1.97	2.41
4	Females	12.57	10.63	18.24
5	Total Indigenous cattle	5.68	5.03	3.63
6	Males	3.49	2.27	1.94
7	Females	2.19	2.76	1.69
8	Total buffalo	59.95	50.03	51.6
9	Males	5.97 (9.96)	4.83 (9.65)	5.34 (10.35)
10	Females	53.98 (90.04)	45.21(90.35)	46.26 (89.65)

Source: BasicAnimal husbandry Statistics (Various issues); 19th livestock census 2012-GoI

Figures in parentheses () indicate proportion of females to respective total of population.

Figures in square brackets [] indicate proportion of cross bred and indigenous population to total cattle population.

Rs 18.27 lakh. The total income from sale of calves for meat and farm yard manure will be Rs 23.52 lakh. The annual net return will be Rs 5.25 lakh and monthly income will be Rs 43,750 and benefit cost ratio will be 1.29 which is quite high than one indicating that the business is secure and viable.

The state can provide additional benefits to the farmers to encourage to join this venture in the form of credit link programme and supply of quality fattening ration at concessional rate. Implementation of this scheme in state will give a boost to the rural economy, employment to rural

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Table 4. Buffalo male calf rearing model for Punjab.

Sr. No.	Particulars	No.	Unit price	Amount (Rs)
A	Capital investment			
1	Cost of shed 2400 sq feet	2,400	500	12,00,000
2	Cost of equipments			25,000
3	Cost of chaff cutter	1	25,000	25,000
4	Total capital investment (Rs.)			12,50,000
B	Fixed cost			
1	Depreciation on shed(@4%			48,000
2	Depreciation on equipments and chaff cutter (10%)			5,000
3	Interest on capital investment (@10%)			12,5000
4	Total fixed cost			1,78,000
C	Variable cost			
1	Purchase of 3 month old calf	100	3,000	3,00,000
2	Green fodder	4,459	0.6	2,67,540
3	Wheat bhusa	637	4	2,54,800
4	Concentrate feed	309.5	18	5,57,100
5	Labour	2	9,000	2,16,000
6	Vet expenses		300	30,000
7	Miscellaneous (Light, water, repair etc.)		2,000	24,000
8	Total variable cost			16,49,440
	Total Expenditure (B+C)			18,27,440
D	Income			
1	Income from sale of calves (3 q/calf)	75	100	22,50,000
2	Income from FYM	2,55,500	0.4	1,02,200
3	Total income			23,52,200
4	Net income from 12 months			5,24,760
5	Net income per month			43,730
6	Benefit Cost Ratio			1.29
7	Returns over variable cost from 12 months			7,02,760
8	Returns over variable cost/month			58,563

landless, rural ladies etc. In addition it will provide avenues for efficient utilization of the crop residue which is currently being burnt or being destroyed. As domestic consumption of buffalo meat in the state is zero, so it will provide continued growth of export oriented meat industry. It will help boost the leather industry. Scientific rearing of buffalo calves with reduced mortality is an essential requirement for improving buffalo productivity which is important for sustained buffalo production and utility with the increasing economic pressure and other constraints.

CONCLUSION

There is no problem of disposal of unproductive buffalo animals and male calves as slaughtering is allowed. Normally the males calves are reared up to 3-4 m for the purpose of milk let down by lactating buffaloes. After that, these are not taken care of and most of them die due to under feeding and some are sold for slaughter at early age. Male buffalo calves can be reared as separate enterprise for earning additional income and generating employment. These should be reared up to age of 15m so that enough weight can be gained before sale. Hence, the rearing of buffalo male calves can help in generating additional income and employment in the state.

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