

Original Research Article

Role of Different Factors in Economics of a Bovine Semen Station

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ABSTRACT

Efficient management of semen stations is of utmost importance in providing valuable genetics to farmers at affordable prices. Different factors play a role in efficient management of a semen station. A study was carried out to study contribution of different factors in deciding economics of Deep Frozen Semen Production Centre, Shyampur, Rishikesh, Uttarakhand, so that an efficient management plan could be devised for better sustainability and efficient working of the centre. The study revealed expenses on salary of employees and feeding of bulls were the major factors influencing sustainability of the centre. A better management of these factors could help bring down production cost, increase profitability and hence improve chances of investment in best genetics available.

Keywords

Different factors,
bovine semen
station

Introduction

Semen station is the backbone of the animal breeding activities. The entire genetic upgradation of livestock in an area depends on the quality of germplasm that a semen station catering to that area, holds and disseminates in the field. Hence it is imperative that these centres of male germplasm are in a continuous mode of upgrading themselves both in terms of technology, management and genetics.

Ever since the adoption of National Project for cattle and buffalo breeding by the government of India, the semen stations in India have grown leaps and bounds both in terms of quality and quantity. The focus of the central government, along with the states, in strengthening semen stations has started showing results. A major infusion of the funds has been in developing the

infrastructure of the semen station. However this, one time investment, may start a station, but its successful and viable functioning requires a careful balancing of various resources in right proportion to achieve optimum results.

Hence a proper knowledge of contribution of different factors in determining the efficient functioning of semen station is required in order to make right decisions while running a semen station.

In view of the facts, a study was taken with the following objective in mind:

To identify the role of different factors in deciding the economics of the Deep Frozen Semen Production Centre (DFSPC), Shyampur, Rishikesh.

Subsequent changes over the years in contribution of different factors influencing the economics of Deep Frozen Semen Production Centre (DFSPC), Shyampur, Rishikesh. Changes in percent contribution of these factors vis-a-vis growth (production and sales) of Deep Frozen Semen Production Centre (DFSPC), Shyampur, Rishikesh.

Materials and Methods

To achieve the aforementioned objectives, data of the last ten years (2007-08 to 2016-17) was collected from Deep Frozen Semen Production Centre (DFSPC), Shyampur, Rishikesh. The centre (DFSPC) has one of the top genetics of the country and is among the leading semen stations of the country ('A' grade semen station) with a pan India presence. The centre maintained six breeds of cattle and one breed of buffalo, during the entire study period. The management and managerial practices were more or less similar throughout the study period, with similar season wise trend of production, except the quantum of production.

The expenses component was broadly divided into:

Fixed Expenses

Variable Expenses

The Fixed assets comprised primarily of salary of staff, depreciation on equipments and buildings. Variable expenses included expenses on bull management and semen processing and preservation costs. The sub component (Bull management) was further divided into expenses on feeding of bulls, general management and labour. Semen processing and preservation cost was further divided into expenses on straws, dilutor, Liquid nitrogen and other consumables (Table. 1)

The cost on agriculture was incorporated in the expenses on feed and fodder for bulls, as the centre has agricultural activities related to other programmes of the state.

Results and Discussion

There was a constant rise in total cost, vis-a-vis number of doses produced. The total cost rose at a gradual pace from 2007-08 to 2011-12. But the rise was sharp from the year 2012-13 to 2016-17 (Table 2, Figure 1).

The cost of production per dose did not significantly rise till 2011-12 (average of Rs 8.65 in first five years). However from 2012-13 onwards it increased significantly (average of Rs 11.41 in next five years) (Table. 4), in spite of the increased in the quantum of production.

Analysis of the data revealed that the on an average, variable expenses contributed to 38.42 % of the semen station in comparison to 61.58 % of the fixed costs. Out of the total variable expenses the share of bull management cost was 47.31 %, while semen processing and preservation costs were 52.69 % (Table 3).

The expense on salary was maximum (39.38 %), followed by expenses on feed and fodder (13.49 %), straws (11.90%), depreciation cost of equipments (10.68 %) and buildings (7.12 %). The percentage contribution of Liquid Nitrogen was only 2.07 % of the total costs incurred by the semen station (Table 3).

Feed and fodder of bulls held the biggest share of expenditure among variable items at 35.11 %, followed by empty frozen semen straws (30.96 %). The other major variable expenses included expenses on Lab consumables (9.90 %). A detailed analysis of expenditure is presented in Table 3.

Table.1 Breakup of Expenses of Bovine Semen Station, Rishikesh

S.No.	Items
I	Variable cost
A	<i>Bull Management</i>
i	General Management
ii	Feed and Fodder
iii	Labour
B	<i>Semen Processing and preservation costs</i>
i	Straws
ii	Dilutor
iii	LN2
iv	Lab consumables
v	Others Expenses
II	Fixed cost
i	Salary of Staff*
ii	Equipment (15 %)
iii	Building (5 %)
iv	Other Expenses

Table.2 Year wise changes in total expenses and cost of production vis-a-vis changes in total production

Items	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
No. of doses produced (In Lakhs)	10.00	13.76	15.37	16.16	18.10	20.07	22.48	26.89	28.80	27.37
Cost of production / dose (In Rs.)	8.6	7.65	8.64	9.46	8.92	8.99	10.54	11.26	12.43	13.85
Total Cost (In Lakhs)	86.05	105.28	132.76	152.86	161.56	180.44	237.03	302.70	358.01	379.21

Table.3 A detailed analysis of expenditure of Bovine Semen Station, Rishikesh

S.No.	Items	% of Total Expenses	% of Variable / Fixed Expenses
I	Variable cost.	38.42	
A	Bull Management	18.18	47.31
i	General Management	1.59	4.14
ii	Feed and Fodder	13.49	35.11
iii	Labour	3.10	8.06
B	Semen Processing and preservation costs	20.24	52.69
i	Straws	11.90	30.96
ii	Dilutor	0.82	2.14
iii	LN2	2.07	5.40
iv	Lab consumables	3.80	9.90
v	Others Expenses	1.65	4.29
II	Fixed cost	61.58	
i	Salary of Staff	39.38	63.95
ii	Equipment (15 %)	10.68	17.35
iii	Building (5 %)	7.12	11.56
iv	Other Expenses	4.40	7.15

Table.4 Change in average total cost of production in five year phases

S.No.	Items	Average from 2007-08 to 2011-12 (% Share)	Average from 2012-13 to 2016-17 (% Share)
I	Variable cost.	34.56	40.11
A	Bull Management	12.81	20.52
I	General Management	1.56	1.60
Ii	Feed and Fodder	8.09	12.34
Iii	Labour	1.31	3.07
B	Semen Processing and preservation costs	18.17	15.94
I	Straws	10.38	9.49
Ii	Dilutor	0.61	0.70
Iii	LN2	2.39	1.41
Iv	Lab consumables	3.18	3.10
V	Others Expenses	1.61	1.25
II	Fixed cost	54.66	48.76
I	Salary of Staff	30.07	33.26
Ii	Equipment (15 %)	11.05	7.79
Iii	Building (5 %)	10.33	3.92
Iv	Other Expenses	3.21	3.78
	Average cost of Production (Rs. / dose)	8.65	11.41

Table.5 Year wise changes in Percent contribution of different factors in economics of semen station

S. No	Items	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
1	Salary of Staff	30.37	36.41	32.3	39.33	38.62	35.2	33.74	36.07	44.89	48.01
2	Straws	12.66	15.11	14.22	9.11	12.23	14.77	12.51	11.59	11.23	10.12
3	Feed and Fodder	6.67	11.02	6.84	9.56	12.89	13.38	17.62	19.22	12.16	14.05
4	Equipment	17.52	2.15	16.49	15.94	12.89	9.89	10.34	12.46	8.97	7.2
5	Building	13.66	16.98	13.42	10.57	9.5	8.42	6.1	4.68	3.78	3.4
6	Other Expenses	4.99	4.08	4.3	3.81	2.75	3.26	5.08	2.87	5.8	5.34
7	Lab consumables	2.08	4.57	2.61	4.88	4.18	6.07	5.59	3.56	3.25	2.31
8	Labour	1.24	1.5	1.43	1.55	1.9	2.71	3.84	3.93	3.74	4.12
9	LN2	2.59	2.48	2.99	3.42	2.63	1.8	1.66	1.3	1.92	1.9
10	Others Expenses	2.81	3.41	2.89	0.58	0.96	1.42	1.13	1.15	1.56	2.11
11	General Management	4.65	1.7	2.01	0.56	0.39	2.1	1.48	2.29	1.87	0.63
12	Dilutor	0.76	0.59	0.5	0.68	1.05	0.98	0.9	0.87	0.83	0.8

Fig.1 Yearwise changes in total expenses incurred vis-a-vis changes in Total Production

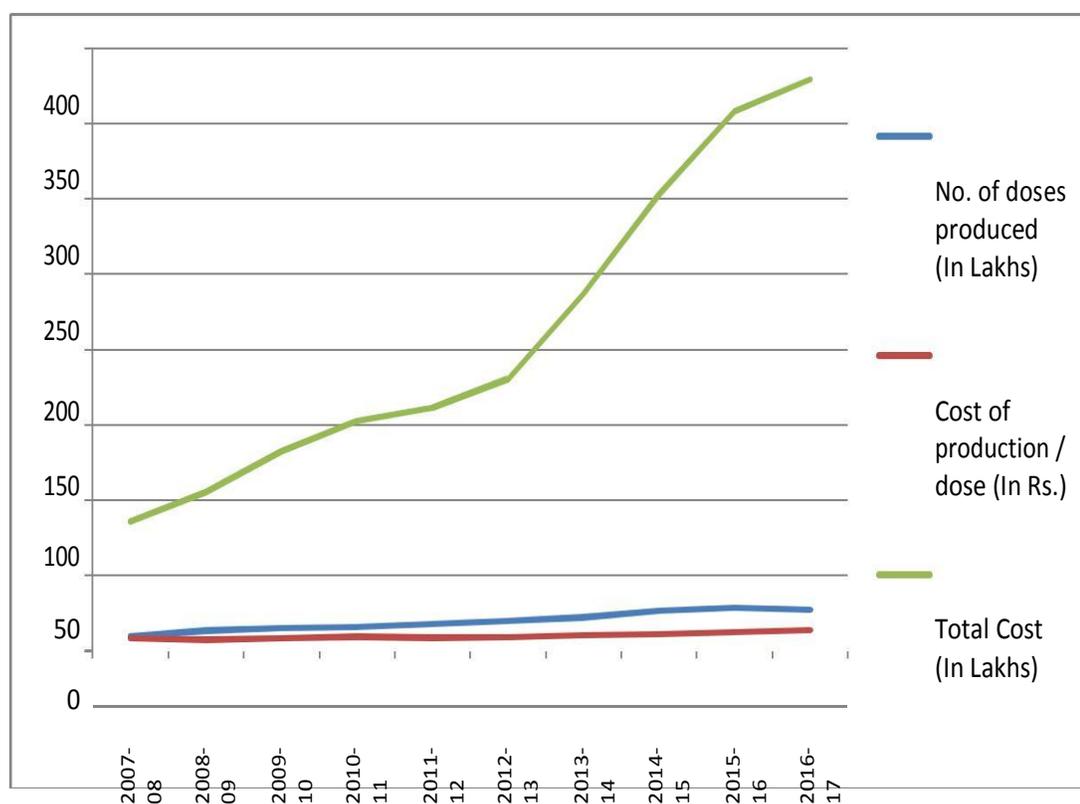


Fig.2 Change in average total cost of production in five year phases

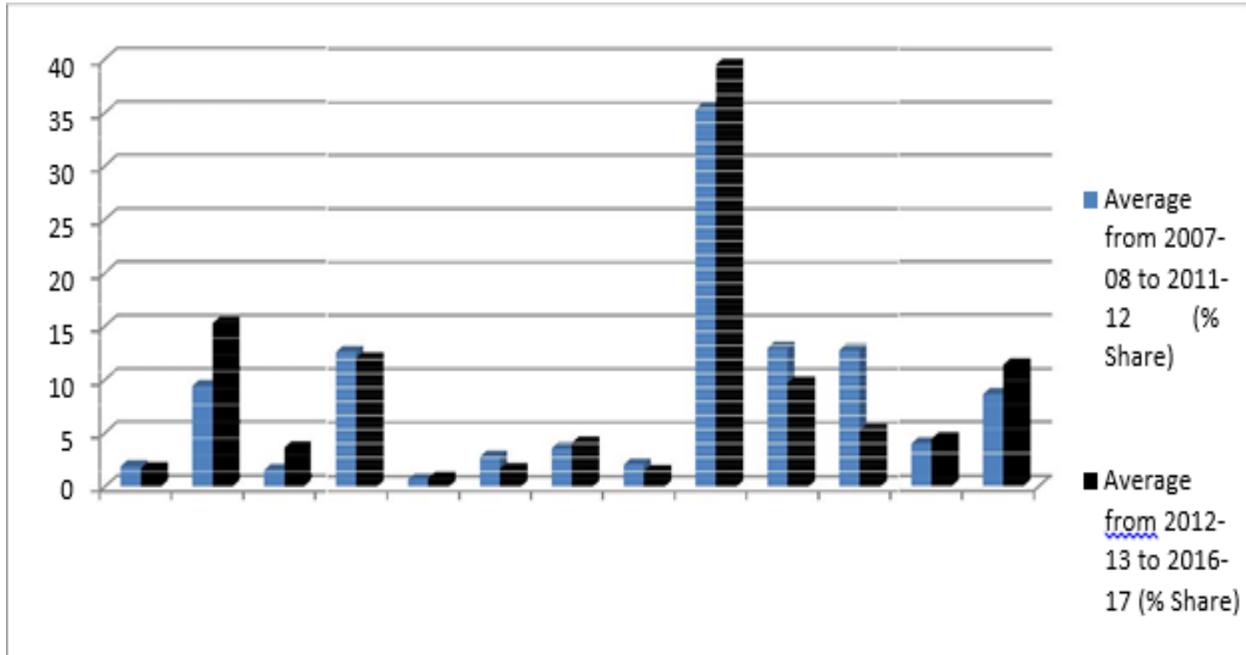
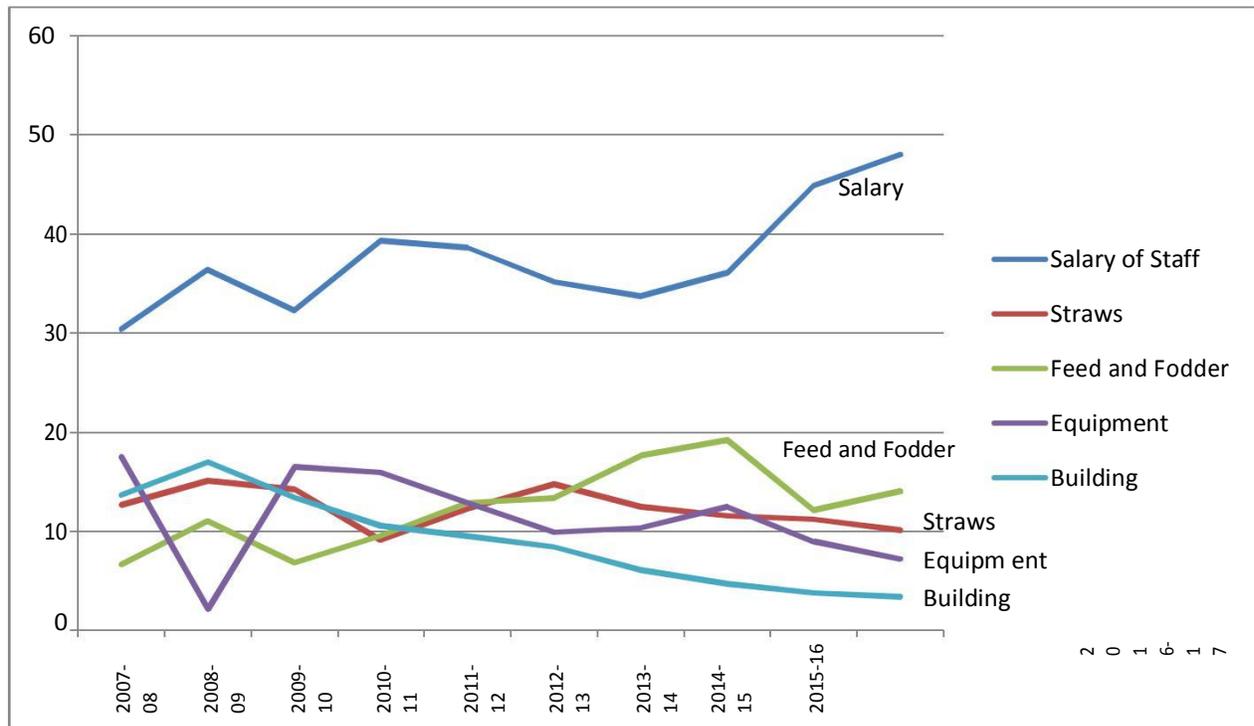


Fig.3 Year wise changes in Percent contribution of different factors in economics of semen station



Significant differences were seen in one area during first five years and last five years (Table 4). While the semen processing and preservation cost decreased slightly, there was a appreciable jump in the bull management cost from 12.81 % in first phase to 20.52 % in second phase (Figure 2).

There was a continuous increase in salary with sudden increase in the last three years. It jumped from 36.07 % in 2014-15 to 48.01 % in 2016-17 (Table 5). The percent expense on straws reduced gradually from 14.77 % in 2012-13 to 10.12% in 2016-17 (Figure 3). The other expenses maintained more or less a same trend with not much change except feed and fodder for bulls.

There appears to be a constant rise in total cost, vis-a-vis number of doses produced. The change in total cost of production from year 2007-08 to 2011-12 was not significant though the quantum of production increased significantly at an annual growth rate of 15.99 % (1000040 doses in 2007-08 to 1810210 doses in 2011-12). The inflation rate during the same period also grew at an average of 9.23 % only (CPI 5.51% in 2007, 9.70% in 2008, 14.97% in 2009, 9.47% in 2010 and 6.49% in 2011).

The rise in total cost was sharp from the year 2012-13 to 2016-17. This could be attributed to rise in quantum of production (2007390 doses in year 2012-13 to 2737180 doses in year 2016-17). But the compounded annual growth rate was only at 8.06%. Also surprisingly the inflation grew at an average of 6.94 % only, gradually decreasing in later years (CPI 11.17 % in year 2012, 9.13 % in 2013, 5.86 % in 2014, 6.32 % in 2015 and 2.23 % in 2016). Closer analysis of the data indicated that cost had nearly doubled for bull management (Table 4) in last five years, particularly cost of feed and fodder for bulls. This may be due to increase in number of

bulls at the semen station and hence more expenditure on their feeding. The salary of the staff, which always was a major contributor to expenses, also increased considerably during last three years, leading to an overall increase in cost of production. (Figure 5)

The cost of production per dose did not significantly rise till 2011-12 (average of Rs 8.65 in first five years). However from 2012-13 onwards it increased significantly (average of Rs 11.41 in next five years), in spite of the increased in the quantum of production. This may be due to increase in input costs which negated the positive effect of increased amount of production. The change in total cost of production showed gradual growth with sharp increase after the year 2011-12.

From the above data it can be safely assumed that expenses on salary, feeding of bulls, empty frozen semen straws, equipment depreciation and building depreciation were the top areas of expenses at DFSPC, Shyampur, Rishikesh. For a more efficient management of semen station, and to create a self-sustainable unit, these areas need to be focussed upon.

Selective placement of trained staff and their optimum utilization can help reduce expenses on salary without affecting the quantum of production. The expenses on empty frozen semen straws may have risen from the high level of discard due to either malfunctioning of the equipments, leniency in initial quality check of semen, not strictly following standard operating procedures, leading to discard of straws. This wastage can be controlled or reduced by placing highly trained staff at key positions, rigorous service and maintenance of equipments. Proper service and maintenance of equipments will help prolong life of

equipments and hence also bring down cost on depreciation of equipments. The expenses on buildings can also be reduced by slight modifications in the existing structures according to latest designs and building materials.

The expense on feeding of bulls is an area which can be manipulated to make it cost effective. Preparation of balanced ration using cheaper and locally available ingredients, looking for alternate sources of cost effective nutrients and adoption of modern feeding methods like Total mixed ration (TMR) can help bring down cost of bull management and hence reduce overall expenses.

Acknowledgements

The authors have used the raw data of Deep Frozen Semen Production Centre (DFSPC), Uttarakhand Livestock Development Board, Shyampur, Rishikesh.

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