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Economics and cost of milk-based drinks in an experimental dairy plant

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Abstract

Regularly assessing the manufacturing cost of various dairy products is very important for the management to make the best decision regarding production, planning and policy framework. The toned milk, flavoured dairy drink and *lassi* are the crucial products of any liquid milk processing plant. Therefore, a study was conducted at the experimental dairy plant, NDRI, Karnal, to estimate the manufacturing cost of these products. The manufacturing cost was found to be Rs. 7.50 per litre for toned milk, Rs. 9.76 per litre for flavoured dairy drinks and Rs. 6.51 per litre of *lassi*.

Keywords: Toned milk, flavoured dairy drink, *lassi*, manufacturing cost

Introduction

Today India is the largest milk producer, with a share of 23% of the total milk production worldwide. Milk production has been growing at an average rate of 5.68 percent per annum. The per capita availability has increased considerably from 289 gm. in 2011-12 to approximately 400 gms. in 2018-19. There is rising consumption of milk and milk products in urban and rural India. The rapid change in the standard of living and greater awareness regarding nutraceutical and therapeutically aspects of food consumed encourages the population to divert more expenditure towards milk and milk products. The toned milk, flavoured dairy drink, and *lassi* are consumed by all classes of society.

Hence, it is necessary to calculate the cost of toned milk, flavoured dairy drinks and *lassi* that help processors make the best decision regarding production, planning and policy framework.

Materials and Methods

The present study has been aimed at carrying out the cost of processing and manufacturing various dairy products in an Experimental Dairy Plant. The secondary data were collected from the records maintained by the different sections of the dairy plant for 2000-2001. These were supplemented by actual observation and interviewing plant personnel. Data on milk inflow, its utilization pattern, and product output was taken from different ledgers of the plant where entries were made. The number of raw materials and the price of the item used for production were drawn from the records of the store section. Data on electricity, refrigeration, and steam from separate records maintained by the utility section. The information on wages and salaries of the person employed was taken from the official records of the plant.

Observations on the operational activities of the processing unit were recorded, such as the quantity of water utilized by the plant, the temperature of different stages of production, the amount of steam required for the product's manufacturing, and electric power utilization. Calculated Electric power utilization by using the horsepower(Unit) of motors (kW) installed on different types of machinery and equipment and the running capacities of the equipment and machinery. (Ahmed, T 1997) ^[4]. Determined Break-even output by applying the following formula:

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$$\text{Break-even point} = \frac{\text{Total fixed cost for the product}}{\text{Price-Average Variable cost}}$$

The component wise cost method (Singh *et al.*, 1981) ^[1] was used to work out the cost of production of flavored dairy drinks, *lassi* and toned milk.

Results and Discussion

Table 1: Component wise cost of flavored dairy drink

Sr. No.	Cost component	Total Cost (Rs.)	Fixed Cost (Rs.)	Variable Cost (Rs.)	Total Cost per unit (Rs./kg)	% Cost
1	Raw material	247479.18	--	247479.18	0.988	50.64
2	Labour	16699	16699	--	0.067	3.42
3	Electricity	1551.68	--	1551.68	0.006	0.32
4	Water	1202.33	--	1202.33	0.005	0.25
5	Steam	9761.5	224.51	9536.99	0.039	2.00
6	Refrigeration	11033.86	951.11	10082.75	0.044	2.26
7	Administration and Supervision	84433.99	84433.99	--	0.337	17.28
8	Repair and maintenance	680	--	680	0.003	0.14
9	Store maintenance	10646.21	10646.21	--	0.043	2.18
10	Quality Control	4909.5	1858.25	3051.25	0.020	1.00
11	Packaging	30582	--	30582	0.122	6.26
12	Depreciation of equipment and building	68500	68500	--	0.273	14.02
13	Sundries	1250	--	1250	0.005	0.26
	Total Cost	488729.25	183313.07	305416.18	1.951	100.00
	Per unit cost (Rs./ 200 ml sachet)	1.95(100.00)	0.73(37.51)	11.221.(62.49)		

Figure in parenthesis are the percentage of the total cost.
Total production in a year = 250485 Sachets of 200 ml

Source: Derived from analysis

Flavored milk is one of the major products of the dairy plant. It contributed a 7.26 percent share of the total revenue of the dairy plant. During the study period, flavored milk contained 2 percent fat, 7 percent sugar, 8.7 percent SNF, colour and flavor at appropriate proportion. For the period under reference, the plant processed 50,097 litres of flavored milk by spending Rs. 4,88,729.25, resulting in a cost of Rs. 1.95 per 200 ml sachet. Component wise cost analysis revealed that the raw material alone contributes 50.64 percent of the total cost. Expenditure on the packaging was 6.26 percent. Expenditure on administration and supervision

was highest contributing 17.28 percent. The expenditure on equipment depreciation like a milk storage tank, HTST system, Pouch filling machine and space occupied by the equipment in the building in proportionate rate was 14.02 percent. Expenditure on labour was 3.42 percent, and another cost component was less than 9 percent in the manufacturing of flavored milk.

Table 1 shows that the after data analysis, the break-even output was found to be 10,133.39 litres, but actual production was 50,097 litres of flavored dairy drink.

Table 2: Component wise cost of *lassi*

Sr. No.	Cost component	Total Cost (Rs.)	Fixed Cost (Rs.)	Variable Cost (Rs.)	Total Cost Per unit (Rs.)	% Cost
1	Raw material	299967.52	--	299967.52	1.925	59.13
2	Labour	10389.6	10389.6	--	0.067	2.05
3	Electricity	969.8	--	969.8	0.006	0.19
4	Water	831.15	--	831.15	0.005	0.16
5	Steam	3057.21	70.32	2986.89	0.020	0.60
6	Refrigeration	6864.92	591.76	6273.16	0.044	1.35
7	Administration and Supervision	62627.78	62627.78	--	0.402	12.35
8	Repair and maintenance	860.9	--	860.9	0.006	0.17
9	Store maintenance	7933.33	7933.33	--	0.051	1.56
10	Quality Control	7636.35	2890.36	4745.99	0.049	1.51
11	Packaging	62337.6	--	62337.6	0.400	12.29
12	Depreciation of equipment and building	42900	42900	--	0.275	8.46
13	Sundries	935.06	--	935.06	0.006	0.18
	Total Cost	507311.22	127403.15	379908.07	3.255	100.00
	Per unit cost (Rs./500 ml sachet)	3.26(100.00)	0.82(25.11)	2.44(74.89)		

Figure in parenthesis are the percentage of total cost.
Total production in a year = 155844 Sachets of 500 ml

Source: Derived from Analysis

Lassi contributed a 5.41 percent share to the total revenue of the dairy plant. During the study period, 31,168.80 litres were manufactured, incurring 25.11 percent fixed costs and 74.89 percent variable costs. The average cost of manufacture of *lassi* was Rs. 3.26 per 200 ml sachet. Component wise analysis revealed that the raw material

alone contributed 59.13 percent, followed by expenditure due to administration and supervision and packaging with their corresponding contribution of 12.35 and 12.29 percent, respectively. Expenditure on depreciation of equipment and building was 8.46 percent, and labour was 2.05 percent,

respectively. All other components of total cost were individually less than six percent.

Table 2 shows that the contributory margin was highest at Rs. 3.54 per 200 ml of *lassi*, where the total fixed cost was Rs. 1,27,403.15, and the average variable cost respectively.

After analysis of the data, the break-even output level was found to be 7,197.92 liter, but the actual output was 31,168.80 liter. This shows that dairy manufacturing surplus production of 23,970.88 liters of *lassi*.

Table 3: Component wise cost of toned milk

Sr. No.	Cost component	Total Cost (Rs.)	Fixed Cost (Rs.)	Variable Cost (Rs.)	Total Cost Per unit (Rs./500gm)	% Cost
1	Raw material	253348.43	--	253348.43	2.48	65.98
2	Labour	6824.20	6824.20	---	0.07	1.78
3	Electricity	641.56	--	641.56	0.006	0.17
4	Water	1020.00	--	1020.00	0.01	0.27
5	Steam	9014.60	207.34	8807.26	0.09	2.35
6	Refrigeration	11272.73	971.71	10301.02	0.11	2.94
7	Administration and Supervision	41211.63	41211.63	--	0.40	10.73
8	Repair and maintenance	630.00	--	630.00	0.006	0.16
9	Store maintenance	5220.46	5220.46	--	0.051	1.36
10	Quality Control	5015.74	1898.45	3117.29	0.049	1.31
11	Packaging	20247.60	--	20427.60	0.20	5.32
12	Depreciation of equipment and building	28600.00	28600.00	--	0.28	7.45
13	Sundries	730.90	---	730.90	0.007	0.19
	Total Cost	383957.85	84933.79	299024.06	3.75	100.00
	Per unit cost (Rs./500 ml)	3.75(100.00)	0.83(22.12)	2.92(77.88)		

Figure in parenthesis are the percentage of total cost.
Total production in a year =102363 Sachets of 500 ml

Source: Derived from analysis

Toned milk contributed 3.56 percent share in the total revenue of the dairy plant. In this cost component, the share of fixed cost was 22.12 percent and variable cost was 77.88 percent. The cost of manufacturing of toned milk was worked out to Rs. 3.75 for 500 ml. Component-wise cost analysis of manufacturing of toned milk revealed that raw milk (3% fat) account for Rs. 2.48 per 500 ml of total cost, followed by administration and supervision with Rs.0.40 per 500 ml and depreciation on equipment's and building was 28 paise and expenditure on packaging was 20 paise per 500 ml. Other cost components of the toned milk was less than 20 paise per 500 ml of toned milk

Table-3 shows that contributory margin was highest Rs. 3.08 per 500 ml in case of toned milk, where total fixed cost was Rs. 84, 933 and average variable cost respectively. After analysis of data, the break-even level of output was found to 13,787.95 liter, but actual production was 51,181.5 litres of milk.

Conclusion

Flavoured dairy drinks, *lassi* and toned milk are integral part of any mini dairy plant. The manufacturing cost of these dairy products depends upon the volume of production and manufacturing cost decreased with increase in the volume of production. Among these lowest manufacturing cost was found to be Rs. 6.51 per litre of *lassi* followed by Rs. 7.50 per litre for toned milk and Rs. 9.76 per litre for flavoured dairy drinks.

References

1. Singh R, Kalra KK. Cost of promising of milk and manufacturing of milk products. In: A Decade of Research in Dairy Economics, Statistics & Management, NDRI, Karnal, India; c1981.
2. Chauhan AK, Kalra KK, Singh VR, Raina BB. A study on the economics of milk processing in a dairy plant in Haryana. *Agric Econ Res Rev.* 2006;19:399-408.

3. Singh AS, Chandel BS, Chauhan AK, Das J, Ravishankara KM. Economics of milk processing in cooperative sector of Haryana. *Indian J Dairy Sci.* 2006;74(3):255-261.
4. Ahmed T. Dairy Plant Engineering and Management. 4th ed. Allahabad: Kitab Mahal; c1997. p. 48-51.
5. Chauhan AK, Kalra KK, Singh RV, Raina BB. A study on the economics of milk processing in a dairy plant in Haryana. *Agric Econ Res Rev.* 2006;19:399-406.
6. Ripi Doni, Chauhan AK. Economics of Manufacturing different Milk Product and Breakeven Point Analysis in Sirsa Cooperative Milk Plant Haryana. *Res J Agric Sci.* 2018;9(4):864-870.
7. Sherpa DL, Tshering D. Cost of production of dairy products at the Milk Processing Units in Haa. Technical report, Ministry of Agriculture and Forest, Bhutan; c2018.
8. Gautam RB, Maurya RM, Ram RS, Verma SK, Agrahari S, Kumar S, *et al.* International Journal of Bio-resource and Stress Management. 2018;9(5):585-591.
9. Arora S, Patel AA, Gurditta H, Yadav U, Mahajan S. *Haryana Vet.* 2019;58(2):174-180.