ECONOMICS OF DAIRY PRODUCTS IN A EXPERIMENTAL DAIRY PLANT

ABSTRACT

Burfi and Ice-cream are among the most crucial Indian dairy products widely used on different occasions of society. Economic analysis of this product is necessary to optimize the cost of each component used for the Burfi and ice cream manufacturing. The dairy product will keep its presence in the competitive market, as a result of this; the consumer will take benefit from this optimum price. Therefore, calculated the product cost was in a dairy plant, and the fixed and variable cost was 24.56 and 75.44 percent for Burfi and 34.01 and 65.99 percent for ice cream, respectively.

Key Words: Burfi,Icecream,Milk product,Dairy

INTRODUCTION

India is ranked first in global milk production, contributing 23 percent of global milk production. Dairy is the single largest agricultural commodity contributing 5 percent of the national economy and employing more than eight crore farmers directly and indirectly. India is ranked 1st in milk production, contributing 23 percent of global milk production. Milk production in the country has grown at a compound annual growth rate of about 6.2 percent to reach 209.96 million tons in 2020-21. (Economic Survey 2021-22) The per capita availability has increased considerably from 197 gm in 1997 to 427 gm in 2020-21. The rapid change in lifestyle vis-a-vis food habits and more significant influence on them will divert more expenditure towards milk and milk products. Burfi and ice cream are well-known dairy products used by all classes of society. Therefore in the dairy industry, it is necessary to calculate the cost of Burfi and ice cream to fix the prices of the product will maintain the equilibrium between producer and consumer interest.

MATERIALS AND METHOD

The present study was conducted at experimental dairy, National Dairy Research Institute, Karnal. The secondary data was collected for the year 2001-2002 from the different sections of the dairy plant. The present study has been aimed at carrying out the cost

of processing and manufacturing of various dairy products in an Experimental Dairy Plant, National dairy Research Institute, Karnal (Haryana). The secondary data were collected from the records maintained in the dairy plant for the financial year 2000-2001.These were supplemented by actual observation and interviewing plant personnel. Data on milk inflow, it's utilization pattern and output of product was taken from different ledgers of the plant where entries made. The quantity of raw material and their price of the item's used for production were drawn from the records of store section. Separate records are maintained for steam boiler. The information on wages and salaries of the person employed was taken from office records of the plant. Actual observation were taken on quantity of water utilized by the plant, temperature of different stages of production, quantity of steam required for the manufacturing of product, electric power utilization was calculated on the basis of horse power of motors (kw) installed on different machineries and equipments, and running capacities of the equipments and machineries. The cost of electricity and steam was calcuted by following.

Electricity cost:

The use of electric motor with each machine is the way for allocating the electricity expenditure on different process or on the product manufactured. However, in the plant under study, meter were not provided for each machine. Therefore, the expenditure on electricity was apportioned in the study using horsepower hours basis. Horse power hours were calculated by following formula:

Expenditure on electricity/unit (kw) = No. of horse power x No. of hours X per unit price

Steam Cost:

The steam cost included expenditure on depreciation of boiler, building, labour, supervision of office, fuel, water, store maintenance, electricity, maintenance and consumable utensils. The total expenditure on steam was calculated on different process product on the basis of quantity of steam used. Quantities of steam required by different product were calculated by taking actual observation and using the following formula:

Total heat required to heat milk(Kcal) = (Quantity of milk x Specific heat x Temperature changes) / Efficiency

Net heat utilized to heat milk(Kcal) = (h x XL) –Total heat condensate

Where,

H = Sensible heat (Kcal/Kg)

X = Wet steam quantity in percent, and

L = Latent heat

Steam required to heat milk(kg) = (Total heat required to heat milk (Kcal)) / (Net steam utilized to heat milk (Kcal/kg)

Beark-even output (BEP):

BEP = Total fixed cost for the product / (Price - Average variable cost)

To work out the cost of production of butter and ghee, the tabular analysis technique were used to workout different cost component of butter and ghee.

RESULT AND DISCUSSION

Table:1 COMPONENT WISE COST OF BURFI

Sr. No.	Cost component	Total Cost (Rs.)	Fixed Cost (Rs.)	Variable Cost (Rs.)	Total Cost per unit (Rs./500gm)	Percent Cost
1	Raw material	164076.26	--	164076.26	16.72	62.36
2	Labour	13644.00	13644.00	--	1.39	5.19
3	Electricity	1835.16	--	1835.16	0.19	0.70
4	Water	233.33	--	233.33	0.03	0.09
5	Steam	5066.31	116.52	4949.79	0.52	1.93
6	Refrigeration	1205.65	103.92	1101.73	0.13	0.46
7	Administration and Supervision	26278.20	26278.20	--	2.68	9.99
8	Store maintenance	3328.77	3328.77	--	0.34	1.27
9	Quality Control	1715.00	649.13	1065.87	0.18	0.65
10	Packaging	24530.00	--	24530.00	2.50	9.32
11	Depreciation on equipments and building	20500.00	20500.00	--	1.48	7.79
12	Sundries		---	700.00	0.07	0.64
	Total Cost		64620.54	198492.14	26.82	100
	Per unit cost (Rs./500gm)	26.82 (100.00)	6.59 (24.56)	20.23 (75.44)		

Figure in parenthesis are the percentage of total cost.
Total production in a year = 9812 Packs/500gm.

Burfi contributed 2.27 percent share in the total revenue of the dairy. During the study period, 4906 kg Burfi was manufactured incurring fixed cost of 24.56 percent and variable cost 75.44 percent. Average cost incurred on manufacturing of Burfi was Rs.26.82 per 500gm.Component-wise cost analysis revealed that the raw material alone constituted 62.36 percent, followed by administration and supervision 9.99 percent. Expenditure on packaging was Rs.5 per 500 gm of Burfi. Depreciation on equipments like condensing plant, Khoa kettle

and space occupied by these equipments in building was 0.67 percent and labour expenditure was 5.19 percent.

Contributory margin was highest of Rs.33.84per kg where total fixed cost was Rs.64,620.54 and average variable cost and selling price were Rs.20.23 per 500gm and Rs.40 per 500gm,respectively.After analysis of data ,the break-even level of output was found to 1634.31 kg but actual output was 4,906 kg. This shows that the dairy plant is having surplus production of 3721.69 kg of output.

TABLE:2 COMPONENTWISE COST OF ICE-CREAM

Sr. No.	Cost component	Total Cost (Rs.)	Fixed Cost (Rs.)	Variable Cost (Rs.)	Total Cost Per unit (Rs./100 ml)	Percentage Cost
1	Raw material	251677.98	--	251677.98	1.72	43.66
2	Labour	32038.07	32038.07	--	0.22	5.56
3	Electricity	2057.79	--	2057.77	0.02	0.36
4	Water	114.93	--	114.93	0.001	0.02
5	Steam	506.25	11.64	494.61	0.003	0.09
6	Refrigeration	5269.53	454.23	4815.30	0.04	0.91
7	Administration and Supervision	68763.60	68763.60	--	0.47	11.93
8	Repair and maintenance	2650.00	--	2650.00	0.02	0.50
9	Store maintenance	8710.53	8710.53	--	0.06	0.46
10	Quality Control	1556.31	589.06	967.25	0.01	0.27
11	Packaging	117233.60	--	117233.60	0.80	20.33
12	Depreciation on equipments and building	85500.00	85500.00	--	0.59	14.83
13	Sundries	435.00	--	435.00	0.002	0.08
	Total Cost	576513.59	196067.13	380446.46	3.93	100.00
	Per unit cost (Rs./500gm)	3.93 (100.00)	1.34 (34.01)	2.59 (65.99)		
Figure in parenthesis are the percentage of total cost. Total production in a year 146542 cups/100 ml.						

Ice-cream contributing 5.94 percent share in the total revenue of the dairy plant. During the study period,1,46,542 cups of ice-cream was manufactured involving an expenditure of Rs.5,76,513.59. The percentage share of variable cost was 65.99 percent and fixed cost was 34.05 percent in the total cost of manufacturing ice-cream. The average manufacturing cost was Rs.3.93 per /100 ml cup of ice-cream.

Added cost of ingredients, raw material including cow milk, sugar, flavor and stabilizer was Rs.1.72 per cup. Packaging is more important to self life incurring an expenditure of 80

paise per cup. The expenditure due to depreciation on equipments like homogenizer, ice-cream mix tank , continuous ice-cream machine, ice-cream filling machine ,deep freezer and space occupied by equipments in building was 59 paise per cup, followed by administrative and supervision expenditure amounting 47 paise per cup and labour expenditure amounting 0.22 paise per cup. Other components of total cost were individually less than 10 paise.

This analysis shows that contributory margin was highest Rs.4.41 per 100ml cup in case, where fixed cost was Rs.1,96,067.13 and average variable cost and selling price were Rs.2.59 per 100 ml cup and Rs.7for 100 ml cup respectively. After analysis of data ,break-even level of output was found to 44,549.67cup for 100ml, but the actual output was 1,46,542 cups of 100ml.This shows that dairy plant is having surplus production of 1,02,082.33 cups of 100 ml output.

CONCLUSION

The study shows that Burfi and Ice-cream for which the costing were carried out fetching good profit though there was inter product difference for various cost components. Burfi and Ice-cream were produced much above the break-even output level.

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