A Perspective View of Cost and Returns Structure - Especially Break Even Analysis in Marketing of Milk

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Abstract

The agriculture sector is regarded as the backbone of the Indian Economy. Nearly 70 percent of the people live in villages and their main occupation is agriculture. Agriculture is closely linked with animal husbandry and plays an important complementary role. The role of animal husbandry in providing the main and subsidiary occupation or the main occupation to the rural population is well recognized. Animal husbandry has secured an important place in Indian agriculture leading to dairy development in India. This study also includes the break-even output for cow and buffalo during lactation and inter-calving periods.

Keywords: Milk marketing, Break-even point, Cow and buffalo, Lactation, Inter-calving period, Milch animals

Introduction

The urban poor in India is largely the overflow of rural poor into urban areas. These migrants from rural areas to urban cities could have crossed the poverty line had industrial development in the country been sufficiently rapid to absorb them adequately in the modern manufacturing industries. Rural poverty in India is closely related to agricultural development, as agriculture is an important source of the large immensity of the population. Rural poverty largely emanates from the semi-feudal relation in agriculture. The land reform measures are undertaken after independence did not make substantial changes in the agrarian relations. Hence, almost all agricultural labour households and a large proportion of small and marginal farmers and landless non-agricultural rural labour households are poor. An agrarian system characterized by concentration of agricultural holdings, unequal access to finance, and inputs such as fertilizer, the new input-intensive technology not only widens income disparities but also results in an increased proportion of the people in extreme poverty.

The economic efficiency and success of a dairy plant largely depend on effective management in cost reduction. The cost of producing a unit of output is a critical management aspect in the dairy industry, particularly in India. The ability to minimize unit costs of producing milk while not curtailing output levels is often a determining factor of the long-term survival of dairy farms in India. Since the low cost of production is critical for dairy farm survival in a competitive Market, Cost studies provide an important part of information and knowledge essential for the formulations and evaluations of economic

policies both at micro and macro levels. It is generally accepted that the adoption of new technology has not only increased the level of output but also efficient utilization of available resources to a greater extent. Cost returns, resource-use efficiency and break-even analysis are the key factors in determining the profitability and visibility in the decision-making process of dairy farming.

Objectives of the Study

- To explore break-even output for milch animals during the lactation period.
- To examine inter – calving period.
- To evaluate the profit volume ratio during inter – calving period.

Methodology

Designing a suitable methodology and selection of analytical tools are important for a meaningful analysis of any research problem. In this section, an attempt is made to prepare a methodology for the present study. It includes sample design, collection of data and tools of analysis.

Tools of Analysis

Break-even Analysis and Resource-Use Efficiency of Inputs by testing the Marginal Value Productivity against unity. To examine the growth of milk production, a semi-log model has been used to measure compound growth rate, which is used to study the orders of preferences of the sampling units.

Break -Even Analysis

Break-even analysis indicates at what level of total costs and total revenue are in equilibrium. It is an analytical technique used to identify the level of output and sales volume at which the firm 'break-even', that is, the revenue is sufficient to cover all costs. Break-even analysis establishes the relationship among fixed and variable costs of production, the volume of production, the value of output, sales value and profit. Break-even analysis is employed to determine the break-even output for cow and buffalo during lactation and inter-calving periods. The formula for calculating the break-even point is as follows:

$$BEP \ (in \ units) = TFC / (ASP - AVC)$$

$$BEP \ (in \ sales \ volume) = (TFC \ x \ Sales) / (ASP - AVC)$$

where,
BEP (in units) = Break-Even output of milk in liters
BEP (in sales volume) = Break-Even output of milk in sales (in ₹)
TFC = Total Fixed Cost
ASP = Average Selling Price of milk per liter
AVC = Average Variable Cost of milk per liter

Contribution

The contribution is the difference between sales and the marginal cost of sales. Contribution enables a farm to meet fixed costs, which gets added to the profit.

Contribution per unit = Selling price per unit - Variable cost per unit

In other words, contribution is the sum of fixed cost and profit. Thus, profit is equal to contribution minus fixed cost.

Profit = Contribution - Fixed cost

Profit Volume Ratio

Profit-Volume Ratio (P/V Ratio) is also known as Contribution-Sales Ratio. It is expressed in terms of percentage and computed as follows.

$$P/V \ Ratio = \frac{Contribution \ per \ Unit}{Selling \ Price \ per \ Unit} \ x \ 100$$

Margin of Safety

The margin of safety is the difference between actual sales and the sales at the break - even point. The margin of safety is the cushion owned by the farm even when there is a decline in milk production per animal but the farm will not incur any loss. The percentage of the margin of safety is calculated as follows:

$$Margin \ of \ Safety = \frac{Actual \ Output - BEP \ Output}{Actual \ Output}$$

or

Margin of Safety = Profit / (P/V Ratio)

Margin of Safety = (The Percentage of Margin of Safety / Sales) x 100

Break-Even Output during Lactation Period

The following table gives the break-even output during the lactation period. The break-even outputs for cow and buffalo are 395.10 litres and 395.86 litres, respectively. The break-even sales volume of cow during the lactation period is ₹ 7506.9 and buffalo is ₹ 8313.06.

Table 1: Break-Even Output during Lactation Period

Capacity Factor	Cow		Buffalo	
	Per unit	Total	Per unit	Total
Average yield (in litres)	-----	2197.32	------	1986.23
Sales (in ₹)	19.00	41749.08	21.00	41710.83
Variable cost	8.97	19723.42	9.93	21300.06
Contribution	10.03	22025.66	11.07	0410.77
Fixed Cost	1.80	3962.93	1.99	4382.24
Profit	8.23	18062.73	9.08	16028.53
Profit Volume Ratio (in percent)	52.78		52.71	
Break-even output (in litres)	95.10		395.86	
Break-even sales in ₹	7506.9		8313.06	
Margin of Safety (%)	82.09		80.06	
Percentage of BEP output to total output	17.98		19.93	

Source: Primary data

The profit volume ratio of cow and buffalo during the lactation period is 52.78 percent and 52.71 percent, respectively; and the margin of safety is 82.09 percent for cows and 80.06 percent for buffalo. The margin of safety is an indicator of the strength of a firm. It is found that the margin of safety is large in both cow and buffalo in the study area during the lactation period. It indicates that the farm can make a profit even if it has to face difficulties. Thus, the percentage of break-even output to total output for cow is 17.98 percent and for buffalo is 19.93 percent. The profit per unit during the lactation period of a cow is ₹ 8.23 and of buffalo is ₹ 9.08. The contribution per unit is ₹ 10.03 for cow and ₹ 11.07 for buffalo. The average selling price per unit of cow and buffalo are ₹ 19.00 for cow and ₹ 21.00 respectively. The study reveals that the profit volume ratio and break-even sales are more or less the same in cow and buffalo.

Break-Even Output during Inter-calving Period

The following table demonstrates the break-even output during the inter-calving period. It is observed that the break-even outputs of cow and buffalo have been 795.40 litres and 733.51 litres, respectively. The break-even sales volumes of cow and buffalo are ₹ 15112.6 and ₹ 15445.71 respectively.

The profit volume ratio during the inter-calving period has been 34.89 percent in cow and 34.80 percent in buffalo. It is observed that the margin of safety for cow and buffalo has been 63.80 percent and 63.07 percent, respectively. It is inferred that the performance of milk producers in terms of margin of safety has been satisfactory during the inter-calving period. Therefore, the percentage of break-even output to total output has been 36.19 percent for cow and 36.92 percent for buffalo. It is inferred that the performance of milk producers in terms of margin of safety has been satisfactory during the inter-calving period.

Table 2: Break-Even Output for Milch Animals during Inter-calving Period

Capacity Factor	Cow		Buffalo	
	Per unit	Total	Per unit	Total
Average yield (in litres)	-----	2197.32	----	1986.23
Sales (in ₹)	19.00	41749.08	21.00	41710.83
Variable cost	12.37	27194.2	13.69	27759.11
Contribution	6.63	14568.23	7.31	14519.34
Fixed Cost	2.44	5273.56	2.70	5362.82
Profit	4.19	9206.77	4.61	9156.52
Profit Volume Ratio (in percent)	34.89		34.80	
Break-even output (in litres)	795.40		733.51	
Break-even sales in ₹	15112.6		15445.71	

Margin of Safety (%)	63.80	63.07
Percentage of BEP output to total output	36.19	36.92

Source: Primary data

The profit per unit during an inter-calving period is ₹ 4.19 for cow and ₹ 4.61 for buffalo. The contribution per unit is ₹ 6.63 for cow and ₹ 7.31 for buffalo. The average selling price per unit is ₹ 19.00 for cow and ₹ 21.00 for buffalo. The study reveals that the profit volume ratio and break-even sales are more or less the same in the cases of cow and buffalo.

Summary of the Findings and Conclusion

The break-even output for cow and buffalo are 395.10 litres and 395.86 litres, respectively. The break-even sales volume of cows during lactation period is ₹ 7506.9 and buffalo is ₹ 8313.06. The profit volume ratio of cow and buffalo during the lactation period is 52.78 percent and 52.71 percent, respectively. And the margin of safety is 82.09 percent for cows and 80.06 percent for buffalo. Thus, the percentage of break-even output to total output for cow is 17.98 percent and for buffalo is 19.93 percent. The profit per unit during the lactation period of cow is ₹ 8.23 and of buffalo is ₹ 9.08. The contribution per unit is ₹ 10.03 for cow and ₹ 11.07 for buffalo. The average selling price per unit of cow and buffalo are ₹ 19.00 for cow and ₹ 21.00 respectively. It is observed that the break-even outputs of cow and buffalo have been 795.40 litres and 733.51 litres, respectively. The break-even sales volumes of cow and buffalo are ₹ 15112.6 and ₹ 15445.71 respectively.

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Conclusion

The study concludes that the growth performance of milk producers in terms of margin of safety satisfactory during the inter-calving period. The average milk yield per day during the lactation period for a cow is 8.57 litres and 7.22 litres for buffalo. The milk yield per day during the inter-calving period for cows is 5.22 liters and 4.39 litres for buffalo. The study reveals that cows yield milk is higher than the buffalo's yield milk. It is interesting to note that there is no significant variation between cow and buffalo in terms of the ratio of gross returns to variable cost and ratio of gross returns to total cost during the inter-calving period in the study area.

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