Practical Exercise 19

Cost of procurement: study of collection, transport and chilling

Objectives: Give practical exposure to the student in estimating the cost of procurement which is comprised of collection, transportation and chilling.

As discussed in Chapter 5, total procurement cost is comprised of costs of collection, transportation and Chilling.

Milk procurement cost

Milk Procurement Cost = Cost of Collection + Cost of Transportation + Cost of Chilling

Cost of milk collection

The costs incurred in milk collection are on weighing, fat measurement equipment, stationary, human labour, cooling, electricity and detergents. The marketing agencies tried to lower the total cost of milk collection by reducing the milk collection centres and pooling of resources like weighing machine and quality measurement equipments.

$$\text{Cost of Collection per litre of Milk} = \frac{\text{Total cost of milk collection}}{\text{Total quantity of Milk Collected}}$$

Transportation Cost

In general, transportation cost is any cost involved in relaying goods to and from a plant, including payments to transport firms for their services and any cost incurred by a plant in using and maintaining its own fleet of vehicles. Generally speaking, transport costs have fallen relatively as a result of improvement in transport technology and transport infrastructure like roads.

While talking about transportation in relation to procurement, it is the carrying of milk from collection centres to the processing plant or the chilling centre.

The components of transportation cost are

1. Depreciation of vehicle
2. Interest on vehicle cost
3. Maintenance charges
4. Taxes and insurance
5. Fuel costs
6. Labour cost

Transportation cost per litre of Milk = Total transporation cost — Total quantity of milk transported

If there are more than one transportation routes, total transportation cost is calculated by adding the cost of transportation and quantity of milk transported by all routes.

Cost of Chilling: The cost of chilling milk is comprised of wages of employees, refrigeration cost, depreciation of equipments, interest on investment, cost of steam and cleaning.

$$\text{Cost of chilling per litre of milk} = \frac{\text{Total cost of chilling}}{\text{Total quantity of milk chilled}}$$

Case Study

Cost of Milk Procurement in Sirmor District of Himachal Pradesh

The cost of milk procurement was estimated in a study conducted by Verma et al (2009-10) in Sirmor District of Himachal Pradesh. In this study, cost of milk procurement was estimated at two Milk Chilling Centre (MCC) at Sarahan and Renukaji, and figures are given in Table 1.

Table 1. Cost of Milk procurement (2009-10) (Rs./lit.)

Cost item	MCC (Sarahan)	MCC (Renukaji)
Procurement Cost	4.04	6.50
Milk Collection	1.58	2.03
Transportation	2.03	3.05
Milk Chilling	0.43	1.42
Price Paid to milk producers	14.03	14.68
Total cost of Milk producers	18.07	21.18
Quantity of Milk Procured (Lt/annum)	439449.5	154282

As per this table, the cost of milk collection, transportation and chilling was observed to be Rs 1.58, Rs 2.03 and Rs 0.43 per litre, respectively at MCC, Sarahan.

Some costing methodologies

1. Man power

The total employments of persons engaged completely for a particular job / section is included in the manpower cost under that particular section. The person who performed multiple duties in different sections, the actual time devoted for each section was ascertained from the manager by taking 8 hours as duty time per day.

2. Electricity

The electricity produced by the generator was estimated by following formula:

Total KWH or units produced = Kilo watt rate of the generator x No. of hours the generator was run

To estimate the cost on electricity, total cost spent on generator and on electricity supply by the chilling plant was divided by the total number of units of electricity.

3. Steam

The total steam produced was arrived at as follows:

B.H.P. = Boiler Horse Power

W. P. = Working pressure in psi

Absolute pressure (A.P.) in Kg/cm^2 = W.P. X 0.0703 + Atmospheric pressure (Where 0.0703 kg/ cm^2 = 1 psi)

Equivalent water Evaporation per hour (E.W.E.) = B.H.P. X 15.63 kg.

$$\text{Actual water Evaporation in kg./hr (A.W.E.)} = \frac{\text{E.W.E. x Latent heat at atmospoeric pressure}}{\text{Total head at A.P.}} \text{ x Boiler efficiency}$$

Where L (Latent heat) and H (Total heat) could be obtained from steam tables. Boiler efficiency has been taken as 85 %

Total steam produced (kg.) = A.W.E. X Number of hours boiler actually operated

4. Refrigeration

During refrigeration, when the water is drained out after passing thorough the head of compressor, the quantity of water drained out per hour is recorded. 40 litres of water is added to this for spillage, evaporation and cleaning of tubs and floor to arrive at the total quantity of water consumed per hour. This is multiplied by the number of hours the compressors run to get the total water consumed for refrigeration. The rate of water actual drained 20 tones of refrigeration per day was observed to be 960 litres/ hour.

Activity

Visit a nearby Milk Chilling Centre and note down the total quantity of milk chilled every day and also estimate cost of chilling per litre of milk.

STUDY QUESTIONS

1 How the cost of milk procurement is calculated?

2 How is the cost of milk procurement important to reduce the cost of production of milk products?