CHAPTER-III

METHODOLOGY

This chapter deals with the methodology which comprises selection of the study area, types of data and information used, sampling techniques and tools used for analysis of data. It is divided in the following sub title:

3.1 Location
3.2 Sampling techniques
3.3 Sources of Data
3.4 Statistical Analysis

3.1 LOCATION

The study was carried out during the year 2017. The geographical location of Junagadh city is 21.31° North (Latitude) and 70.28° East (Longitude). The maximum temperature of this district is 45.5°C (19/5/2016) and minimum temperature is 7.0°C (22/01/2016). It records a rainfall of 1125.1(45 days) mm annually and seasonal rainfall 972 (41 days) during 2016. The geographical area of Junagadh is 8846 sq. km. As per 2016 census, the population of Junagadh city is 5,173,250. The city is famous with its architecture and numerous historic places of interest, as well as spectacular views from Girnar Mountain. The Cattle Breeding Farm and Mini Dairy Plant is located in Junagadh Agriculture University, Junagadh.

The present study was confined to the Cattle Breeding Farm along with Mini Dairy Plant of Junagadh Agriculture University, Junagadh. Cattle Breeding Farm at Junagadh Agricultural University, Junagadh was selected purposively for the study.
3.2 SAMPLING TECHNIQUE

The simple random sampling technique was used. The sample is restricted to only purchasing of milk from Cattle Breeding Farm. Hence, total 120 consumers were selected for the study purpose from the Junagadh city as the milk sold to the consumer residing in Junagadh city and employees of Junagadh Agricultural University.

3.3 SOURCES OF DATA

The data was collected from both primary sources and secondary sources.

3.3.1 Primary data

The primary data was collected with the help of well prepared questionnaires by taking the responses of the consumers toward Mini Dairy Plant at Junagadh Agricultural University, Junagadh. The questionnaires used for customer satisfaction level and perception about milk purchase.

3.3.2 Secondary data

The secondary data was collected through the following sources:

- Directly from the Cattle Breeding Farm
- Junagadh Agricultural University's website (www.jau.in)
3.4 STATISTICAL ANALYSIS

Based on the well-structured questionnaires, interview of customers was conducted. The simple tabular analysis and graphical presentation, standard cost concept, cobb-douglas function, marginal value productivity and return to scale was used to find out the production and marketing performance of mini dairy plant at Cattle Breeding Farm Junagadh.

3.4.1 Cost calculation

The standard cost concept was used for calculation of milk production from cow and buffalo, (Devi, 2014)

Cost A= Expenditure on feeds and fodder + Veterinary expenditure + expenses on hired human labour + miscellaneous expenditure + depreciation on fixed assets

Cost B include:

\[ B = \text{Cost A} + \text{Interest on the value of owned capital} + \text{Rental value of own land} \]

Cost C include:

\[ \text{Cost C} = \text{Cost B} + \text{Imputed value of family labour} \]

3.4.2. Cobb-Douglas

A Cobb-Douglas production function was fitted in order to determine the efficiency of each variable in the production of milk. The estimated production function was in following form (Dhanabalan, 2009)

\[ \ln Y = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + u \]

Where,

\[ Y = \text{Value of milk yield per animal per day during the lactation period in rupees} \]
\[ X_1 = \text{Value of green fodder feed per animal per day during lactation period in rupees} \]
\[ X_2 = \text{Value of dry fodder feed per animal per day during lactation period in rupees} \]
\[ X_3 = \text{Value of concentrates feed per animal per day during lactation period in rupees} \]
\[ X_4 = \text{Maintenance cost per animal per day during lactation period in rupees.} \]
\[ X_5 = \text{Miscellaneous expenditure per animal per day during lactation period} \]
\[ U = \text{Disturbance term} \]

\[ \beta_0, \beta_1, \beta_5 \text{ are the parameters to be estimated} \]
3.4.3 Marginal Value productivity

The marginal value productivity (MVP) of a particular resource represents the expected addition to the gross revenue caused by an addition of one unit of that resource, while other inputs are held constant. The marginal value productivity of any particular input say Xi can be derived as (Dhanabalan, 2009)

\[
MVP_{x_i} = \frac{dy}{dx_i}
\]

- MVPx1- Green fodder = \( \beta_1 \frac{Y}{X_1} \)
- MVPx2- Dry fodder = \( \beta_2 \frac{Y}{X_2} \)
- MVPx3- Concentrates = \( \beta_3 \frac{Y}{X_3} \)
- MVPx4- Maintenance Cost = \( \beta_4 \frac{Y}{X_4} \)
- MVPx5- Miscellaneous Expenditure = \( \beta_5 \frac{Y}{X_5} \)

3.4.4 Return to Scale

The returns to scale have been estimated from the estimated coefficients at the production functions. The magnitude of returns to scale indicates the percent increase in milk production when all the inputs are increase simultaneously by one percent. (Dhanabalan, 2009)

3.4.5 Return from milk production

Gross income= value of milk + value of dung

Net income= Gross income-Gross cost

(Devi, 2014)

3.4.6. Likert scale:

The Likert scale technique was used to identify the customer’s satisfaction level towards milk. (Karthikeyan, 2014)

A Likert scale is a psychometric scale commonly involved in research that employs questionnaires. It is the most widely used approach to scaling responses in survey research, such that the term is often used interchangeably with rating scale, or more accurately the Likert-type scale, even though the two are not synonymous. The scale is named after its inventor, psychologist Rensis Likert. Likert distinguished between a scale proper, which emerges from collective responses to a set of items (usually eight or more), and the format in which responses are scored along a range. Technically speaking, a Likert scale refers only to the consumers. The difference between these two concepts has to do with the distinction Likert made between the underlying phenomenon being investigated and the means of capturing variation those
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points to the underlying phenomenon. When responding to a Likert questionnaire item, respondents specify their level of agreement or disagreement on a symmetric agrees-disagree scale for a series of statements. Thus, the range captures the intensity of their feelings for a given item. A scale can be created as the simple sum of questionnaire responses over the full range of the scale. In so doing, Likert scaling assumes that distances on each item are equal.

A Likert item is simply a statement which the respondent is asked to evaluate according to any kind of subjective or objective criteria. Generally the level of agreement or disagreement is measured. It is considered symmetric or "balanced" because there are equal numbers of positive and negative positions. Likert scaling is a bipolar scaling method, measuring either positive or negative response to a statement. The items like highly satisfied, satisfied, average, dissatisfied, and highly dissatisfied