

A Study on the Quality Requirements in Milk Processing and the Quality Initiatives Adopted by Bangalore Dairy



Management

KEYWORDS : QMS, Quality Measures, Supply Chain

L.R.S.Mani

Acharya's Bangalore B School, Bangalore, E - 111, Brigade Gardenia, J.P.Nagar 7th Phase, Bangalore-560078.

ABSTRACT

Milk is an essential food for growing children in all parts of the world. Milk is one item consumed by all the people irrespective of race, religion, social group, economic status and age group. It is imperative that the milk dairies take initiatives to monitor and maintain the quality right from the source. The aim of this study is to describe the various quality systems that can be adopted by the dairies and also explore the quality initiatives across the entire supply chain of milk. The Karnataka Milk Federation is on the lines of AMUL in Gujarat. The scope is to cover Bangalore Dairy though there are 13 dairies under KMFL. The data is collected by interviewing the personnel at the cooperatives and the dairy and also organization website. The author concludes that the higher market share for Nandini is due to the quality measures deployed at each stage.

INTRODUCTION

The quality of milk consumed by the children has a direct effect on their physical and mental health. Hence it is very important that quality control measures are effected at each stage i.e. from village farmer level to the district cooperatives to the processing centres the milk dairies.

The important place milk occupies in our diet has been recognized since Vedic Times and all the latest research all over the world has only reinforced and strengthened this fact. Milk is now considered not only desirable but an essential intake from the moment the child is born. The National Institution of Nutrition has recommended a minimum of 300 grams intake of milk for children between 1 to 3 years of age. Milk has high nutritive value. It supplies proteins, bone forming minerals, health giving vitamins and fats.

Karnataka Milk Federation started in the year 1965 is modeled on the lines of AMUL at Gujarat and their brand Nandini enjoys a higher market share compared to their competitors in Karnataka. A detailed study is made at Bangalore Dairy and some of their milk cooperatives to understand the QMS adopted by them at various stages to ensure timely availability of good quality milk to the consumers across Karnataka and some neighboring states.

LITERATURE REVIEW

The review of existing literature pertaining to the research study enables one to analyze the research carried out in different dimensions. With the help of the same, the gaps in that particular area can be identified.

Kopecky (2008) in his article in Quality Digest details ten steps to creating a culture of quality. These are very much applicable to the food industry as well as the milk dairies. The nine steps detailed by him are as follows:

1. Guarantee that processes are controlled across the entire supply chain.
2. Create a risk-based system for gauging and ranking suppliers.
3. Realize that quality problems always exist.
4. Implement proper escalation procedures.
5. Determine the root causes of issues in the supply chain.
6. Apply effectiveness checks in a closed - loop system.
7. Ensure companywide corrective and preventive action policies.
8. Institute a proper process for customer complaint and inquiry management.
9. Adopt the philosophy of Six Sigma with its proven record for continuous improvement and its ability to improve processes by removing defects.

Foong (2006) goes about detailing how to interpret the eight Quality Management Principles to ISO 9001:2000 QMS. All Quality Management Systems are based on eight Quality Management Principles such as Customer Focus, Leadership, In-

volvement of People, Process Approach, Systems Approach, Continual Improvement, Factual Approach to Decision Making and Mutually Beneficial Supplier Relationships.

Kulkarni (2004) in a case study on AMUL - Gujarat Cooperative Milk Marketing Federation published in a book on Supply Chain Management talks more on the supply chain aspects. In this case study, they have also covered the concepts such as Kaizen, Hoshin Kanri, Small Group Activities etc. Automatic Quality checks at all levels right from collection from the farmers to the manufacturing of the finished product ensures that quality remains standard at all the stages through which the product moves.

Ghatnekar (2000) in an article Quality Management - The need of the hour for dairy industry have mentioned that in the quest for higher quality and more profitability, the dairy business is passing through revolutionary upgradation and that the need for such upgradation has been well realized. Since the dairy industry in India plays an important role in the national economy and also because it is likely to have a major share in exports, it is imperative for the dairy industry to adopt various quality standards.

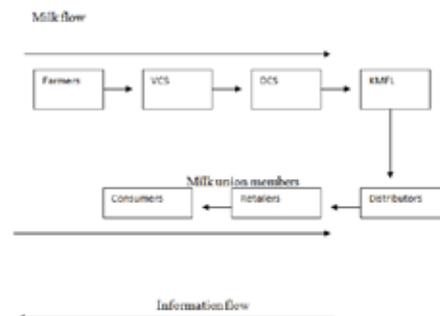
Gaps Identified In Existing Research - It is observed that there is no detailed and exhaustive study on Quality Management in Milk Dairy covering all stages i.e. from Cow to Consumer.

MILK SUPPLY CHAIN & MANUFACTURING PROCESS

It is basically a four-tiered structure in which the farmers or individual milk producers organize themselves into dairy cooperative societies at the village level. These village level cooperatives are further organized into district level unions. The individual milk producers and the village level cooperative societies jointly share the responsibilities of animal health, animal feed and their breeding.

After the milk is collected at the dairies, they undergo quality checks before they are taken up for processing and packaging. Then they are distributed through the State Milk Marketing Federation and reach the consumers.

The supply chain can be represented diagrammatically as follows:



Some of the features more specific to the supply chain of milk as opposed to the supply chain for engineering products are as follows:

- The shelf life is very limited. Hence the actions at each stage need to be coordinated very closely.
- Special refrigerated vehicles are required for the transportations of milk.
- People in the upstream of the supply chain i.e. the village cooperative members may not be highly educated. Hence need to be treated with more care and personal attention.
- The time available in the last stage of the supply chain is also limited. Almost all the customers want the supply of milk at the same time.

Information flow is in both directions and is an essential part of this supply chain. Also usage of information technology and computers has become a way of life. The computers run the automatic milk collection system, which ensures immediate preparation of milk payment bills, transparency of operations and greater efficiency of milk collection.

The milk is milked from Cow by the farmers and is bought to the Co-Operative Society. Once the milk is collected from the farmers at the Co-operative society collection centers, it is transported to chilling units within 4 hours to prevent it from perishing. It is then transported to Mega Dairy through vehicles, which contains sealed containers. After the testing it is sent to the processing unit where pasteurization, cream separation & rinsing are done simultaneously. Then the milk is sent to packing unit for packing.

At the processing and packaging stage in the dairy, more automation is introduced which takes care of problems that can arise due to too many manual intervention by the operators. Also Quality assurance measures are introduced at each stage during processing & packaging of milk.

QUALITY MANAGEMENT SYSTEMS FOR MILK DAIRIES

United States Food & Drug Administration (USFDA) was the first to introduce a Food Safety Standard called HACCP. Hazard Analysis & Critical Control Points is a systematic preventive approach to food safety that identifies physical, allergenic, chemical and biological hazards in production processes that can cause the finished products to be unsafe and designs systems and measurements to reduce these risks to a safe level. HACCP is basically aimed at prevention of hazards rather than finished product inspection.

The HACCP system can be used at all stages of the milk supply chain. Based on risk assessment, HACCP aids in the organization to reallocate their resources efficiently in establishing and auditing safe food production practices.

ISO 22000 is a standard modeled on the lines of HACCP and developed by the International Organization for Standardization, headquartered at Geneva, Switzerland. This Food Safety Management System (FSMS) specifies the requirements involving elements such as Organization Structure and Responsibilities, Data Management, Process Details, Product Quality, Sustainability and Independent Audit. Since food safety hazards can occur at any stage in the milk supply chain, it is essential that the critical points are identified and controls are put in place. For this, an integrated effort of all the parties across the milk supply chain is very essential. This calls for clear and continuous communication between organizations both upstream and downstream in the milk supply chain. Communication with customers and suppliers about identified hazards and control measures will assist in clarifying customer and supplier requirements. The most effective food safety systems are established, operated and updated within the framework of a structured management system and incorporated into the overall management activities of the organization.

ISO 22000 is aligned with quality management system (QMS) ISO 9001 in order to enhance the compatibility of the two standards. ISO 9001:2008 is a generic QMS standard applicable for all organizations including milk dairies. This standard specifies

that the organization shall issue and maintain six documented procedures such as Control of Documents, Control of Records, Internal Audits, Control of Nonconforming Product, Corrective Action Plan and Preventive Action Plan. The standard also requires the organization to issue and communicate a documented Quality Policy, Quality Manual and Procedures for the various Processes.

QUALITY CONTROL REQUIREMENTS

A Quality Control Laboratory needs to be established for controlling the quality at various stages incorporating the design of latest quality parameters. Some equipments required Lactometer, Electronic, Milk Control Meter, High Temperature Heating Equipment and instruments for checking the cleanliness of the milk tankers and silos.

QUALITY CONTROL AT BANGALORE DAIRY

BAMUL (Bangalore Milk Union Limited) has accorded highest priority for the quality milk and has adopted the holistic approach called 'Quality Excellence from Cow to Consumer'. Constant efforts are made to improve quality at all stages of procurement, milk production, processing, packing and distribution. The Quality Control Division is responsible for carrying out various quality management activities listed below:

- Monitoring the in-process parameters
- Ensuring hygiene in all stages
- Creation of in-house testing facilities for various quality parameters
- Conducting Quality Awareness Programme to develop and sustain quality improvement culture across all levels of the organization.
- Developing quality standards for packaging materials
- Assessing quality of packaging materials and other consumables purchased by the Union
- Calibration of testing equipments
- Attending to and resolving customer complaints

FOUR STAGE QUALITY CONTROL AT BAMUL

Before the Milk is distributed the quality of the Milk is tested four times.

1st Stage :-

The Milk is collected from the villages and then it is sent to the chilling centers. The milk is chilled at 3 to 4 degree Celsius. In these chilling centers the quality of the milk is checked and it is filtered.

2nd Stage :-

The milk is then brought to the Dairy in insulated milk tankers in which a temperature of 3 to 4 degree Celsius is maintained. The quality is then checked in the silos, with each silo having a capacity of 1,00,000 liters.

3rd Stage :-

The milk is then sent for processing, pasteurizing and standardizing. In the pasteurizing process the milk is heated at 70 to 73 degree Celsius to kill the bacteria if any. They use latest technology machinery for pasteurizing, processing and standardizing.

4th Stage :-

After the processing is over the milk is then sent to the packaging department. After the packaging is done they check the final quality of the product before sending it to the suppliers and distributors.

QUALITY CONTROL EQUIPMENTS USED BY BAMUL

- Lactometer – for checking the density of milk
- Electronic Milk Control Meter – for checking the fat content in the milk
- Ultra High Temperature Equipment for heating the milk at high temperatures to kill the minute particles and bacteria
- Corporatized Cleaning Equipment – for cleaning the milk tankers and silos at frequent intervals
- Rinse Balance Tank – for reprocessing the waste milk
- Cream separate – for removing the dust particles and bacteria which cannot be seen through the naked eyes.

CONCLUSION

BAMUL has taken required measures for maintaining and improving the quality. The continuous training and education at the farmer and village cooperative levels can be further intensified and the farmers can be educated on modern cattle rearing methods. These steps can go a long way for further improvement in quality.

REFERENCE

Kulkarni Sarika & Sharma Ashok, Supply Chain Management, Tata McGraw-Hill Publishing (2004) | www.kmfnandini.coop, | www.nddb.org | http://en.wikipedia.org/wiki/ISO_22000.