Technews
National Dairy Development Board
For Efficient Dairy Plant Operation

July-August 1997 No. 9

QUALITY MANAGEMENT

This bulletin includes technical information, latest developments on products, systems, techniques etc. reported in journals, companies' leaflets, books and based on experience. The technical information would be on different areas of plant operation in different issues. It is hoped that the information contained herein, if employed in the factory, will help in making dairy plant operations more efficient.

Your contributions and suggestions will make the bulletin more useful, and are welcomed.

The theme of information in this issue is ***Quality Management.*** *It may be understood that the information given here is by no means complete.*

In This Issue

1. QUALITY MISHAPS

* A consignment of table butter, on export order, was inspected before loading onto the ship. It had to be withdrawn due to carton printing inadequacy. Later, on examination, pieces of butter paper were found in the butter!
* A customer complained about the presence of extraneous materials in milk powder tin.
* Several consumers complained, at different times, of the presence of piece of packaging film, insect and piece of rubber seal in the pouched milk.
* Milk pouch buyers returned pouches because a pouch weighed 430 g instead of required 518 g. Similar cases of lower fat and solids-not-fat than required in the milk abound.
* Many customers, finding milk of sour taste and peculiar odour, changed to another brand.
* Likewise, several customers complained of stale and rancid flavour in the packaged butter.
* An export order was cancelled because a dairy could not meet the supply schedule.
* On such complaints, a dairy manager commented, "Well, in a dairy of multiple operations, these things do happen now and then."

Unfortunately, these are **not isolated** cases. Despite this rather obvious need for quality service, production people focus on 'get out the production' first and quality second. Production officers almost invariably set targets related to productivity rather than quality improvement. Quality gets attention as a matter of routine only. However, the old philosophy that **error is inevitable and you should learn to go alongwith it is no longer acceptable.** Does one realize how costly are such errors for the organization? There is always a better way, the challenge is to find it.

2. WHY QUALITY MANAGEMENT?

The industrial liberalization policy introduced in 1991 by the Government of India has changed the business environment in the country. Additionally, with increasing milk production at a steady rate of 4-5%, the problem of disposal of surplus milk is also increasing. The consumer has also become more quality conscious as the market is presenting him wide choices.

The Indian cooperative sector, therefore, has not only to satisfy the internal consumer with top product quality, but also to compete with multi-nationals and other private

dairies in national as well as in global markets. In this backdrop, it is not enough to manufacture good quality dairy products, it is also necessary to maintain uniformity and consistency of quality. Thus, wise dairy manufacturing organizations are recognizing **Quality Assurance or Management as a passport for long term survival** in highly competitive market place and entry into new national and global markets.

3. BENEFITS OF QUALITY MANAGEMENT

The rewards of higher quality are positive, substantial and pervasive. Attaining quality superiority produces the following organizational benefits :

1) Greater customer loyalty
2) Market share improvement
3) Higher prices
4) Greater productivity
5) Reduced service calls
6) In case of ISO 9000 certification, additionally, acceptance by European Community (EC) customers and others whose criteria of acceptance include such certification.

Good and quality product or service is plain and simply 'Good Management'.

4. TQM, ISO, JIT, TPM, CWQM?

Once the importance of quality management (QM) was realized, the Indian dairy industry started coming across several QM techniques, unknown to it till recently, like total quality management (TQM), standards of the International Organization for Standardization (ISO), just-in-time (JIT), total productive maintenance (TPM) and company wide quality management (CWQM).

And this has confused most of them. While the various QM techniques have their own merits and are suitable to specific situations, TQM and ISO have become more popular. The ultimate goal of all these techniques is maximising the profit through 'quality route'. This is achieved by **non stop improvement leading to zero defect.**

5. TQM or ISO?

The meaning of quality in any QM system is not the usual good, excellent, sturdy, high etc., but is the one as defined by the quality gurus :

Deming... Quality should be aimed at the needs of consumer, present and future.

Juran... Quality means fitness for use.

Crosby... Quality means conformance to requirements.

And in ISO 8402... Quality is.... the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs.

All these imply, in simple words : **Quality = customer satisfaction.**

Let us now clearly understand what TQM and ISO are.

TQM was pioneered by quality gurus, most notable of whom are W. Edwards Deming, Joseph M. Juran and Philip Crosby. Each has distinct TQM design, but one important thing is common : emphasis on human element. Basically, TQM is the integration of all functions and processes within an organization in order to achieve continuous improvement of the quality of goods and services. The goal is customer satisfaction, TQM places a great emphasis on people and targets for a change in organization culture, and is thus people based QM.

ISO:9000 series are a set of standards formulated by the International Organization for Standardization. They do not concern specifications of products or services. They establish management systems and processes in order to deliver products or services conforming to agreed requirements between the supplier and his customer. ISO places a great emphasis on system standard and is thus system based QM.

Both the techniques have the same final objective and employ many common elements. It is difficult to draw a clear boundary line between them. They are not mutually contradictory, rather, **they should complement each other.** Broadly speaking **TQM is ISO plus right first time every time culture.**

It is amazing how close to perfection you can get, if you are willing to try.

6. TOTAL QUALITY MANAGEMENT

TQM concerns with overall and continuous improvement in all the areas of a business organization through active and full participation of all people. The goal is customer satisfaction. Fig. 1 shows a basic model of TQM.

Leadership : In TQM, as in any QM technique, the most important element is **Leadership**. Long term vision, total commitment to organizational values, participative style and preparing people to accept and implement change in the organization are its fundamental ingredients. Quality is determined by the top management, it cannot be delegated. Its prime task is to establish a suitable TQM (work) culture and notion that improvement is a continuous process. **If progress is only ever blocked for one reason, it is believing that what one is doing at the moment cannot be improved upon.**

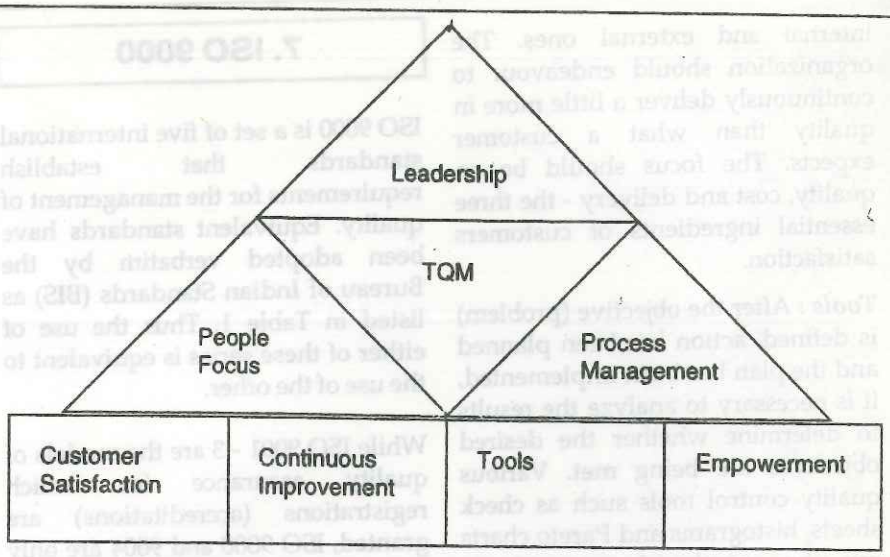

Fig. 1. A basic model of TQM

People Focus : While TQM needs initiation and commitment by management, its success depends on full involvement of all employees. They need to be educated in TQM concepts and application through suitable training programmes and other exercises. They also need to be empowered to take decisions at their level to enhance customer satisfaction. A culture needs to be created where they are encouraged to discuss quality problems they encounter with their managers with a view to get them solved. The front-line supervisors are important link in TQM, who can make or break a quality improvement effort.

Process Focus : According to quality gurus over 85% quality problems in an organization are process-related and less than 15% are worker-related. Deming opines that 96% of quality variations have common causes and 4% have special causes. Out of the worker-related problems, many can be traced to poor training or lack of proper communication. Hence, **standardization of all processes — not just production processes** — in the organization assumes great importance. ISO 9000 certification very appropriately satisfies this requirement.

Customer Orientation : The success and growth of any business organization depends on the level of customer's satisfaction with its products. Hence, **an organization should be customer driven at all levels.** The customer includes both

internal and external ones. The organization should endeavour to continuously deliver a little more in quality than what a customer expects. The focus should be on quality, cost and delivery - the three essential ingredients of customers satisfaction.

Tools : After the objective (problem) is defined, action has been planned and the plan has been implemented, it is necessary to analyze the results to determine whether the desired objectives are being met. Various quality control tools such as check sheets, histograms and Pareto charts can be employed to aid in organizing data in order to extract information.

7. ISO 9000

ISO 9000 is a set of five international standards that establish requirements for the management of quality. Equivalent standards have been adopted verbatim by the Bureau of Indian Standards (BIS) as listed in Table 1. Thus the use of either of these series is equivalent to the use of the other.

While ISO 9001 - 3 are the models of quality assurance for which registrations (accreditations) are granted, ISO 9000 and 9004 are only supporting guidelines documents. These standards are for management of a quality assurance system, and do not set product specifications. ISO standards are generic, intended

Table 1 Indian Standards Equivalent to the ISO 9000 Series

ISO	Indian Equivalent	Title
ISO 9000	IS 14000 : 1988*	Quality Management and Quality Assurance Standards : Guidelines for Selection and Use.
ISO 9001	IS/ISO 9001:1994	Quality Systems — Model for Quality Assurance in Design/Development, Production, Installation and Servicing.
ISO 9002	IS/ISO 9002:1994	Quality Systems — Model for Quality Assurance in Production, Installation and Servicing.
ISO 9003	IS/ISO 9003:1994	Quality Systems — Model for Quality Assurance in Final Inspection and Test.
ISO 9004	IS 14004:1994*	Quality Management and Quality System Elements Guidelines.

* *These will be redesignated shortly in line with other standards of ISO 9000 series.*

to apply to all industries, and are not technical documents.

As the title indicates, ISO 9002 is suitable for dairy manufacturing factories. ISO 9001 is suitable for organizations which are also involved in design/development.

8. ELEMENTS OF ISO 9002

The various elements of ISO 9002 standard are give in the following table :

Table 2 Elements of ISO 9002

Title	Sub-section Nos.
Management Responsibility	4.1
Quality System Principles	4.2
Contract Review	4.3
Document Control	4.4
Purchasing	4.5
Purchaser Supplier Product	4.6
Product Identification & Traceability	4.7
Control of Production	4.8
Inspection & Testing	4.9
Inspection, Measuring & Test Equipment	4.10
Inspection & Test Status	4.11
Control of Non-conforming Product	4.12
Corrective Action	4.13
Handling, Storage, Packaging & Delivery	4.14
Quality Records	4.15
Internal Audits	4.16
Training	4.17
Statistical Techniques	4.18

Under this quality system, the overall efficiency of the activities can be increased, and reliable output quality achieved, by specifying each individual's allotted role in writing. Quality is assured by documenting the work flow, issuing written instructions as to the methods to be used, and working according with these standards.

Thus, documentation of the required activities, process goals and methods are essential to operate the complex systems efficiently, and to make it visible. These documents are reviewed from time to time, and obsolete documents are promptly removed from all points of issue or use.

Many organizations hate the onerous task of documentation. Unreasonably though. If you have not written it out, you have not thought it out. Moreover, as people come and go, change jobs, and forget a procedure, documentation ensures that a record is maintained for continuity, and the product is continued to be made at the same quality level. **A simple advice is 'document what you do and do what you document'** in the form of a quality manual.

A pre-requisite to certification is a third-party audit of the quality system. **Many managers are averse to a third party audit. Well, they do not have to do this — survival is not compulsory.**

9. SPECIAL NEEDS OF DAIRY INDUSTRY

Dairy processing has special requirements. Dairy products must be free from harmful additives, microbes and remain so also, for a period it is intended to be consumed. It, therefore, calls for special care in handling right from raw milk through processing and packing and transport to the consumption point.

Thus, to achieve the objective of QM it is necessary to plan the following :

i) Develop raw materials specifications
ii) Quality of ingredients used in formulations
iii) Appropriate processing equipment and safe environment
iv) Use of processing methods and conditions
v) Inclusion of intermediates in specifications
vi) Develop appropriate labelling specifications
vii) Specifications of quantity per pack
viii) A specified distribution system and cycle
ix) Appropriate storage, handling and preparing instructions

The process is to be kept in constant vigil to produce consistent results. All operations are carried out under strict hygienic conditions to eliminate any contamination of the product produced.

10. IMPLEMENTING THE SYSTEM

Once a decision is made to adopt the ISO standards and seek accreditation, the following major steps will facilitate successful change :

* Recognize the need for change and get the **commitment of top management.**
* **Incorporate quality** in the strategic plan as the linchpin of differentiation.
* Formulate and adopt a holistic quality policy statement adopted to ISO requirements. **Get support and commitment from all managers.**
* Determine the **scope of the business to be certified.** Will it be a particular process, related facilities, a geographical site, or the whole company?
* Determine the **status of the current quality system** through an internal audit. Define the gap between where you are and what it will take to close the gap.
* Estimate the cost in time and money, and implement the plan by organizing the necessary action steps.
* **Prepare the quality manual** including all the elements required in the standard. Document quality policy, procedures, work instruction

etc. in easy, simple language. The entire documentation could be done generally in upto 3 levels manuals:

Level 1 : An overview type of quality manual consisting of policies that meet the requirements of ISO standards for which certification is sought.

Level 2 : Functional or departmental operating procedures in terms of "who does what."

Level 3 : Work instructions that explain how each task is to be accomplished.

For those organizations which are implementing a quality management system already, it is not difficult to get ISO accreditation. The importance of preparation for accreditation lies not so much in the certification itself, but in the quality system that results from the effort leading to it. Certification is a beginning, not an end. Continuous evaluation, feedback, and fine-tuning are suggested. The responsibility of internal and continuing 'audit', of course, is top management's.

11. RENEWAL OF CERTIFICATION

Once done, certification is valid for three years during which period the certifying body (such as BIS) continues to monitor whether the organization adheres to the stated methods.

After completion of three years, the organization has to apply for renewal of ISO certification. Since all the procedures have already been documented, revisions are easier.

When problems occur, causes can be traced and existing standards revised. **No technical progress can be made, if failures result in no more than the reworking of nonconforming items,** while the information obtained, remains the property of individual officers, and does not become part of the organization's overall body of knowledge. **It is always advantageous to prepare and prevent, rather than repair and repent.**

Quality Only Happens When You Care Enough To Do Your Best

SOME USEFUL REFERENCES

Crosby, P. (1979). **Quality is Free,** McGraw Hill, New York.

Deming, W.E. (1982 a). **Quality, Productivity, and Competitive Position,** Center for Advanced Engineering Study, Massachusette Institute of Technology, Cambridge.

Deming, W.E. (1982 b). **Out of the Crisis,** Center for Advanced Engineering Study, Massachusette Institute of Technology, Cambridge.

Garvin, D.A. (1988). **Managing Quality,** The Free Press, New York.

Hui, Y.H., Ed. (1993). **Dairy Science and Technology Handbook 3. Applications Science, Technology, and Engineering,** VCH Pub., New York.

Juran, J.M. (1951). **Quality Control Handbook,** McGraw Hill, New York.

Juran, J.M. and Gryna, F.M. (1980). **Quality Planning and Analysis,** McGraw Hill, New York.

Kume, H. (1996). Quality Management by ISO 9000 and by TQC, **Quality Update,** 3(4), pp 1-6.

Lamprecht, J.L. (1992). ISO 9000 : **Preparing for Registration,** ASQC Quality Press, Milwaukee.

Omachonu, V.K. & Ross, J.E. (1994). **Principles of Total Quality,** St. Lucie Press, USA.

Porter, M. (1985). **Competitive Advantage : Creating and Sustaining Superior Performance,** The Free Press, New York.