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SELECTED ISSUES CONCERNING QUALITY MANAGEMENT IN THE COMPANY

У статті подано аналіз ключових питань, пов'язаних з управлінням якістю: починаючи з визначення поняття якості, її сутності та методу управління нею. Крім того, визначено сприйняття якості як споживачем, так і виробником, а також вплив якості на життєвий цикл товару. Встановлено, що управління якістю є важливою концепцією функціонування сучасного підприємства.

Якість продукції, що випускається на ринок, є одним з найважливіших факторів, що формують конкурентоспроможність компанії на ринку. Тому інтерес до питань управління якістю має вирішальне значення для розвитку компанії. Якість продукції є вирішальним фактором у сприйнятті покупцем як компанії, так і товару, який вона постачає, що формує позицію компанії та її бренд.

У роботі проаналізовано методи управління якістю виробництва. Зокрема виділено такі методи, як: розвиток функції якості, аналіз причин та наслідків дефектів продукції, які можуть виникати під час проектування, також метод 5S. В назві останнього зашифровано п'ять понять (японських слів), що описують ставлення до організації та управління робочим місцем.

Система управління якістю згідно з існуючими стандартами ISO 9001 є однією з обов'язкових систем управління якістю, впроваджених на підприємствах харчової промисловості. Поліпшення якості шляхом адаптації дії до процедур та інструкцій, що містяться в стандарті, позитивно впливає на підвищення престижу та якості пропонуваного товарів та послуг, покращення обігу документації, збільшення кількості заявок на замовлення та покращення внутрішньої комунікації. Через внутрішні та зовнішні переваги, що виникають внаслідок роботи системи управління якістю, сумісної з ISO 9001, її можна класифікувати як ефективний інструмент конкурентної переваги.

Ключові слова: *якість, управління якістю, споживач, виробник, життєвий цикл продукту.*

В статье представлен анализ ключевых вопросов, связанных с управлением качеством: начиная с определения понятия качества, его сущности и метода управления ним. Кроме того, определены восприятия качества как потребителем, так и производителем, а также влияние качества на жизненный цикл товара. Установлено, что управление качеством является важной концепцией функционирования современного предприятия.

Качество выпускаемой на рынок продукции является одним из важнейших факторов, формирующих конкурентоспособность компании на рынке. Поэтому интерес к вопросам управления качеством имеет решающее значение для развития компаний. Качество продукции является решающим фактором в восприятии покупателем как компании, так и товара, который она поставляет, что формирует позицию компании и ее бренд.

В работе проанализированы методы управления качеством. В частности выделены такие методы, как: развитие функции качества, анализ причин и последствий дефектов продукции, которые могут возникать при проектировании, также метод 5S. В названии последнего зашифровано пять понятий (японских слов), описывающих отношение к организации и управлению рабочим местом.

Система управления качеством в соответствии с существующими стандартами ISO 9001 является одной из необязательных систем управления качеством, внедренных на предприятиях пищевой промышленности. Улучшение качества путем адаптации действий с процедурами и инструкций, содержащихся в стандарте, положительно влияет на повышение престижа и качества предлагаемых товаров и услуг, улучшение обращения документации, увеличение количества заявок на заказ и улучшение внутренней коммуникации. Вследствие внутренних и внешних преимуществ, возникающих в результате работы системы управления качеством, совместимой с ISO 9001, ее можно классифицировать как эффективный инструмент конкурентного преимущества.

Ключевые слова: *качество, управление качеством, потребитель, производитель, жизненный цикл продукта.*

Introduction

Considerations on the subject of quality management in a company should start from the analysis of quality concept, which is not clearly specified. The first mentions of quality appeared already in ancient Greece. The issue of quality can be considered in different contexts. The paper focuses on definitions, types, consumer and producer perception of quality and quality management stages.

Concepts of quality and quality management

Quality is an important issue in today's competitive world. The concept of quality is difficult to define, because for each of us it means something completely different. Since ancient times, many experts have been developing definitions of this term, thus over the years many definitions of quality have been developed with different aspects (philosophical, economic, technical, psychological or legal). Differences in the concept's interpretation depended on the type of industry or scientific field for which they were created. According to Plato, quality is the degree to which an object of excellence is achieved. However, according to Aristotle, quality is understood as a set of features that distinguish a given object from other of the same kind. In the case of an engineer, it seems that Aristotle's definition of quality as a set of features is more useful (Wolniak and Skotnicka-Zasadyń, 2010). The definition of quality has also been developed for the purposes of quality standards, which state that quality is the degree to which a set of natural properties (physical, temporal, ergonomic, functional and other) of a product meets needs or expectations that have been established, adopted or are mandatory (PN-EN ISO 9001:2015). The characteristics associated with the quality concept are, in particular, compliance with standards, safety of use, functionality, practicality, reliability and durability. These properties are very important both from the consumer's and manufacturer's point of view (Trziszka, 2009).

Quality management is a developed discipline of management sciences. It is closely related to the quality control system of products and production processes in the company. The concept of quality management began to function in the second half of the 20th century.

One of the precursors of quality management concept was A. Feigenbaum. He is the creator of total quality control (regulation) concept, which was then developed into the total quality management concept TQM. The implementation of this concept took place in five areas of activity: formulating a company strategy in which product quality is the main objective; transforming the quality strategy into detailed technical and marketing specifications that meet the needs and requirements of the purchasers; assigning duties and responsibilities for product quality throughout the company (Ziółkowski, 2007). Another very important and modern concept of quality management is the Deming cycle used for continuous improvement in companies. This cycle consists of four stages:

1. Planning – setting the objectives and assumptions of the project, preparing the operating procedure and necessary documentation,
2. Execution – implementation of planned operations, monitoring of processes,
3. Verification – comparison of the achieved effects with the assumptions,
4. Action – identify non-compliance with the plan, specify corrective and preventive actions (Sęp and Pacana, 2001).

Using this model, the company should be subject to continuous self-improvement processes, which are helpful in adapting to changes in the environment. This phenomenon is called the Deming cycle (Toruński, 2009).

J.M. Juran has also made a big contribution to the development of quality management. Many of his concepts were used in the ISO 9000 standards. The concept he created, presents a scheme of continuous improvement, which is competitive in relation to the previously developed Deming cycle. It is based on three stages:

- Quality planning – describes activities aimed at identifying the customer and his needs, improving processes responsible for creating product features attractive to the customer.
- Quality control – aimed at achieving the planned objectives in relation to the product, process and operational activities, the process should include estimation of the current status of task execution and comparison with the established principles, and then determining and taking action to eliminate these differences.
- Quality improvement – a stage consisting in improvement of processes concerning elimination and reduction of losses, it is important not only to correct the error, but also to draw conclusions in order to introduce necessary changes (Zapłata, 2009).

Deming and Juran's quality management concepts are based on similar principles. Both models are aimed at raising awareness of the needs and opportunities of the company, as well as defining specific objectives for improvement. When using the quality management schemes, it is important to assign problematic measures to appropriately trained employees.

It is very difficult to define quality unequivocally and universally, taking into account all aspects of life that may be relevant, even if we limit our considerations to the production company itself or even to the production process.

The essence and importance of production quality management

Management comprises four basic and core activities: planning, organization, direction and control (Fig.1). All these functions are related to decision making (Wiśniewska and Malinowska, 2011).

Production quality management processes take place within companies. Quality planning begins with identification of external and internal customers by defining their needs. It is important to determine the characteristics of the products that suit the customers. The next step is to set quality objectives that meet the needs of consumers and suppliers at the lowest possible production costs. Strategic quality planning is aimed at comparing predetermined plans with the results obtained using strictly defined measurement units, so that the information obtained can be objectively evaluated. It also aims to interpret the differences that occurred between the performed activities and assumed standard, and to establish actions in order to resolve these differences (Sikora, 2010).

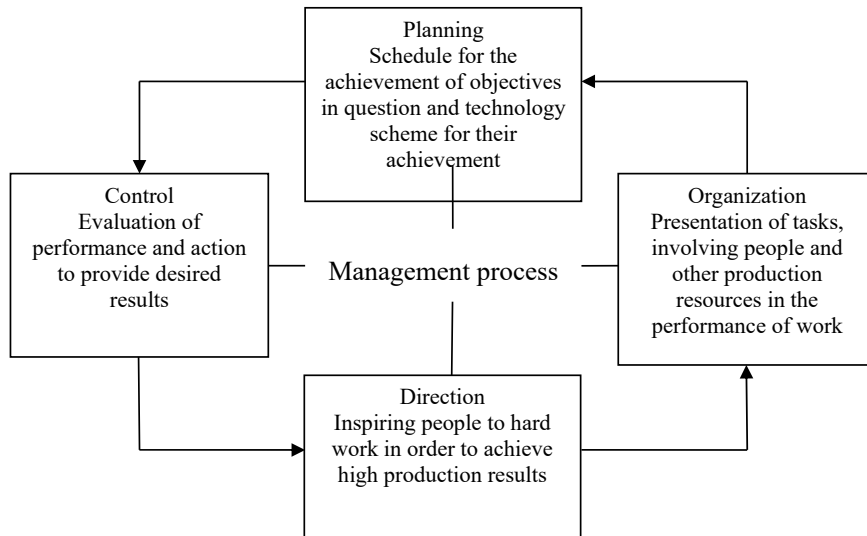


Fig. 1. Four different management functions

Source: Luning P.A., Marcelis W.J., Jongen W.M.F. (2005), *Food quality management: technology and management approach*, Scientific and Technical Publishing House, Warsaw.

Organization is a management function that deals with creating the best conditions for people and equipment for achieving a specific goal while working together. Adequate use of human resources has an important role in production quality management. The company should enable employees to develop and use their skills to meet the company's objectives. The organization is an important function both in allocation of responsibilities to individual employees, as well as in integrating the entrusted tasks by which it shows people how to work together. In order for the organization's activities to produce the desired results in the company, they must be coordinated and verified through control reports. This ensures continuity of commands and responsibility for the execution of assigned tasks (Luning, Marcelis, Jongen, 2005).

Direction in the process of production quality management is focused on human resources of the company. This function is also called leadership and means inspiration, motivation and targeting of employees' tasks to achieve the desired goal. Management is needed to put the team in order during problematic situations and to maintain the company's position in a competitive, constantly changing market. Leadership contributes to preparing people to do their job and improving their working style. Together, these activities create loyalty and teamwork based on values and pursuit of common goals (Kiev and Sikora, 2003).

The most important function of production quality management is the control of processes and products. According to Evans and Lindsay (1996), quality control was defined as a continuous process of evaluating performance and taking corrective action when necessary. The purpose of this function is to produce a product that meets the requirements and is within the limits of a set standard. Each production quality control system consists of a measuring unit and actions related to the comparison of the obtained results with standard or requirements. Minimum deviations from the standard are acceptable. However, if there are many irregularities in the control, it is necessary to carry out accurate corrective actions. In the food industry, increased number of process controls reduces defects in the final product. It follows that the control function contributes to the improvement of food product quality (Zalewski, 2002).

Production quality management methods

In manufacturing companies, managers and employees support their quality improvement activities with methods that are an essential part of quality management. The principles of method application are universal and communicated to employees so that they can comply with them in the workplace. According to Hamrol (2007), production quality management methods can be divided into two groups according to six criteria:

Group A – criteria related to the benefits of applied method:

- Constant impact of the method on quality improvement,
- Achievement of fast quality results,
- Motivation for teamwork.

Group B – criteria related to expenditures of applied method:

- Additional time spent on applying the method in relation to the time spent by the employees on their main tasks,
- Costs to be borne by the enterprise for the recruitment of an employee to carry out the activities provided for in the method,
- Additional qualifications of existing employees required for proper, effective and efficient application of the method.

The first method of quality management is QFD, i.e. quality function development. This method is a way of translating information from the market and consumer requirements into the technical language used in the company by designers and technologists. It enables to define general and technical parameters of products and processes in which particular parts are produced. In this way, the market needs can be translated into the conditions that the company must meet when manufacturing this product in subsequent stages of production, starting from design, through production, to sales. The method focuses its activities on the customer and his needs. The condition for correct application of the method is market research aimed at identifying the consumer's needs. The basic tool of the QFD method is a diagram called a quality house due to its shape. Introduction of this quality management method in a company requires additional time and above-planned qualifications of employees, but it gives a long-term impact on quality and its effects are visible after a short time of application (Zalewski, 2008).

The second way of quality improvement in an enterprise is the FMEA method. It is based on the analysis of causes and effects of product defects, which may arise during product design. It is aimed at estimating the risk of discrepancies and errors in the product or production process. Corrective actions are developed on the basis of description of the resulting defects. The application of FMEA method is recommended for complex, multi-stage processes before the start of serial production. This ensures that the required effectiveness and efficiency of process is achieved. FMEA analysis is recommended when introducing a new product to the market, using new materials for production, operating the product in extremely difficult conditions or in case of other possibilities of product application. The analysis consists of three main procedural steps:

1. Preparation – identification of the problem and its causes
2. Proper analysis – calculation of numerical indicators for defined causes
3. Introduction and control of preventive actions.

The effectiveness of actions is based on the work of appointed team, consisting of representatives of various company departments. At each stage of the process, employees use auxiliary tools to analyse the problem, such as brainstorming, consumer opinion polls, surveys and interviews conducted among engineers and designers. Implementation of the activities should be constantly monitored. This provides the company with additional information to reduce the incidence of faults. The FMEA method, similarly to QFD, requires considerable time and competence of employees and generates additional costs. The strong point of this method is the lasting impact on the improvement of quality and mobilization of employees to teamwork (Lenik, 2011).

Another method of production quality management used by enterprises in order to improve quality is the 5S method. It refers to five Japanese words that describe the attitude

towards organization and management of workplace. The principles included in this method aim to increase productivity by reducing losses, improving and eliminating useless processes. Otherwise, these activities are referred to as effective workplace organization. A special aspect is the maintenance of order and cleanliness, as well as discipline during work. This method is characterized by five interrelated elements of practice. Selection (seiri), which concerns the elimination of unnecessary hazardous and disorderly objects from the workplace, thereby disturbing the productivity process. It is also important that the necessary items are sorted by application in a manner that is convenient for use. Systematics (seito), focusing on putting objects in the right order to shorten the time of searching for what is needed. Cleaning (seiso), consisting in maintaining cleanliness during and after work by regularly cleaning the workplace and working environment. Standardization (seiketsu), which is based on the establishment of rules for maintaining order in the form of a cleaning schedule. A clean working environment is beneficial for the well-being of employees and reduces the risk of accidents. Self-discipline (shitsuke), which is a practice that summarizes other principles. It concerns compliance with established rules and regulations that reduce the number of mistakes caused by inattention. This concept has proven its worth in different organizational structures. Thanks to skillful implementation, 5S can become not only the next rule to be followed, but also have a positive impact on interpersonal relations and better perception of the company by customers. Due to the universality of this method, it can be used not only for production workstations, but also in warehouses and offices (Myszewski, 2009).

Another method of production quality management is the Just in Time delivery system. The application of this concept enables to increase the efficiency and flexibility of production by reducing stock levels as much as possible, shortening the production cycle and harmonizing the supply with the production. The main assumption of this method is production without stockholding. It aims at complete elimination of unreasonable management and waste, by supplying the production processes with all necessary components at the right time and in the required amount. Just in Time is a system that, by eliminating all possible process losses within the company, allows for achieving the best possible quality and lowest possible costs, as well as delivering products in accordance with customer requirements and on time. Delivery of raw materials to the production line at the right time and sale of final products immediately after their production enable to avoid their storage. This in turn is associated with the reduction of costs associated with the maintenance of large warehouse space. The JiT concept comes down to seven zeroes: no shortages, no inventory, no delays, no queues, no unnecessary operations, no inactivity, no unnecessary movements. Meeting the assumptions of this idea in practice takes place through the use of short order execution cycles, launching short production runs, only when the demand for a given product increases, using the services of suppliers located in short distances from the company. The above activities contribute to the improvement of organization and work efficiency. An important aspect is also the training of executive employees to work on various positions. This allows employees to replace each other when needed. To sum up, implementation of the Just in Time method is quite a costly undertaking, but thanks to its application, the number of shortages in the production process is reduced, the number of products delivered on time is increased, the production time is shortened, stocks and costs associated with storing finished products are reduced. The entire process contributes to an increase in the profitability of production, which is the most important perspective for running a business (Zymonik and Hamrol, 2013).

Summary and conclusions

The quality of product released on the market is one of the most important factors shaping the competitiveness of a company on the market. Therefore, the interest in quality management issues is crucial for the development of companies. Product quality is a decisive factor in the customer's perception of both the company and the product it supplies, which builds the company's market position and brand.

The Quality Management System according to the existing ISO 9001 standards is one of the non-compulsory quality management systems implemented in food industry enterprises. Improvement of quality by adapting actions to the procedures and instructions contained in the standard has a positive impact on the increase of prestige and quality of offered products and services, improvement of documentation circulation, increasing the number of applications for orders and improvement of internal communication. Due to internal and external benefits that result from the quality management system compliant with ISO 9001, it can be classified as an effective tool of competitive advantage.

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