Condensed canned milk with sugar and fruit-berry syrups produce by the TQM concept

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Abstract. *The article considers the main stages of implementing concept of total quality management in the dairy plant conditions of production. Conceptual principles "of process approach" and "orientation to the consumer" in technology of condensed canned milk with sugar and fruit-berry syrups were analyzed. The advantages of TQM concept during production of CCM were provided.*
Key words: *total quality management, condensed canned milk with sugar, fruit-berry syrup, concept, principle.*

Анотація. *Розглянуто основні етапи реалізації концепції загального управління якістю в умовах молочноконсервного комбінату . Були проаналізовані основні принципи «процесного підходу» та «орієнтація на споживача» в технології згущених молочних консервів з цукром і плодово-ягідними сиропами. Були визначені переваги TQM-концепції під час виробництва ЗМК.*
Ключові слова: *загальна концепція управління якістю; згущені молочні консерви з цукром; плодово-ягідний сироп; концепція; принцип*

Introduction. The concept of total quality management (TQM) is a set of principles, methods, means and forms of quality management aimed in increase of the efficiency and product competitiveness [1]. It considers comprehensive and purposeful implementation of systems and methods of quality management in all spheres of activity from research and development to after-sales service with the participation of all levels management and employees by the sustainable usage of technical capacity.

Usage of the main provisions of the TQM concept during production of condensed canned milk with sugar and fruit-berry syrups (CCM with sugar and FBS) will allow producers to implement high quality product that completely responds to the needs and demands of society.

Term «TQM» in dairy enterprises is interpreted as follows: T - an approach that comprehensively and thoroughly covers all types of activity, Q - quality of raw materials and quality of management, M - Management that based on new principles, covering all managers. All components of the concept were shown in Fig. 1.

TQM is a particular technology of all processes quality improvement management. It consists of three parts: 1) basic system; 2) system of technical support; 3) system of improvement and development of total quality management [3].

The base system - means used for analysis and research. They are generally based on the use of mathematical tools and methods of statistical control.

System of technical support – approaches and programs aimed at employees training how to use these

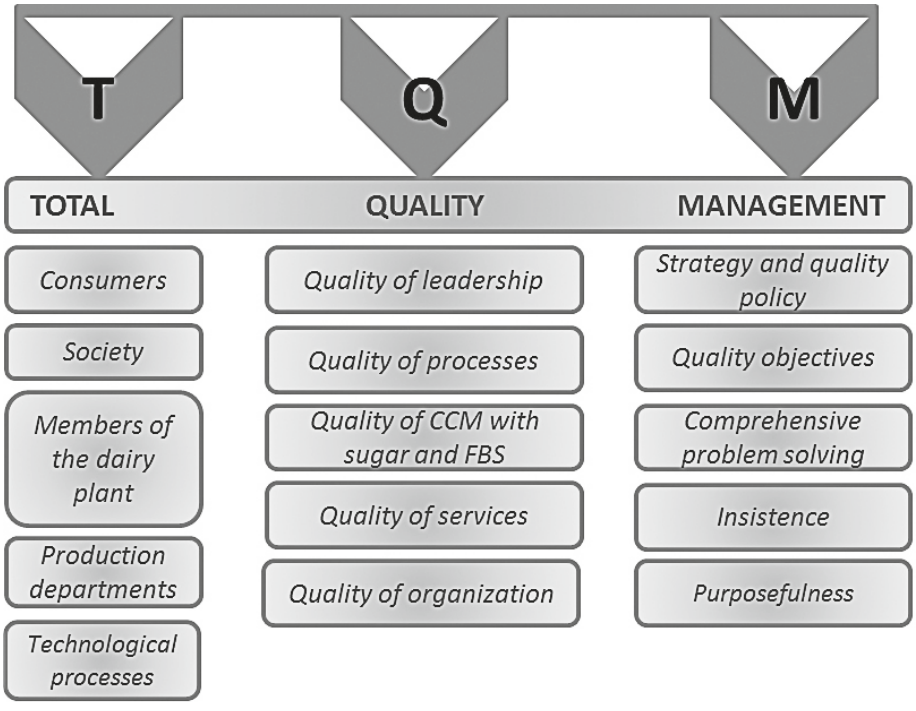

Fig.1. Components of the TQM concept

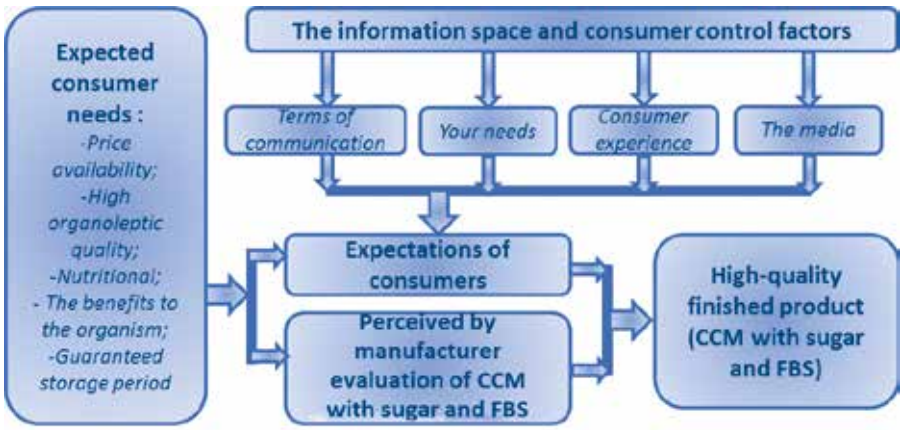

Fig. 2. Architecture of the consumer expectations

tools and how to apply them properly.

System of improvement and expansion of principles and contents of TQM considers adaptation of scientific approaches, economic laws of market relations functioning, organization laws, structure and quality of management principles to specific requirements and canned milk market conditions.

Experimental. It is clear that the strategy of creating CCM with sugar and FBS with high quality on dairy plant will be a successful if the most important elements of TQM concept will be implemented in the manufacturing process. They also include the following: directing of all activities to the needs and wishes of both external and internal customers; enabling real participation of everyone in achieving main goal (satisfaction of consumer needs); directing attention to the process as an optimal system to achieve the main goal (maximizing value of products for the consumer and minimizing its cost for the consumer and for the manufacturer); constant and continuous improvement of the quality of products and services; basing of all decisions of the company only on facts and not on intuition and experience of its employees.

However, experts among considered concepts do not have consensus on the number and content of its elements. This is caused by that position of TQM are widely used in not related different industries. Concept is currently used in industrial, technological, economic, technical industries, etc.

TQM: 1) orientation to the consumer; 2) the process approach. Below both of them are reviewed in details.

Orientation to the consumer. Producers of condensed canned milk with sugar are totally depend from the market demand; the owners of dairy plants should listen to customers' expectations and fulfill their wishes.

Analysis of modern trends of dairy industry showed that almost all product range of canned milk does not comply with healthy and balanced nutrition, which is becoming increasingly popular among the Ukrainian popula-

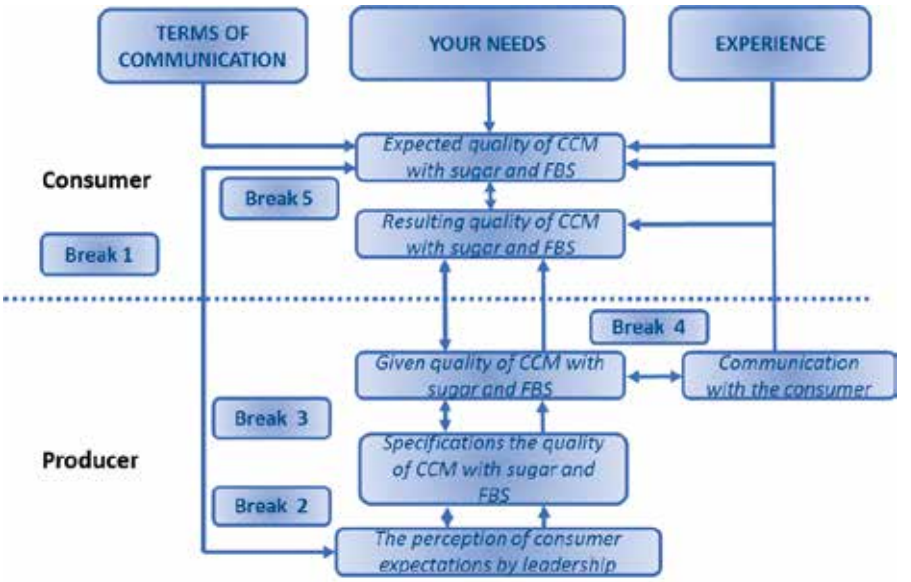

Fig. 3. Model of CCM with sugar and FBS quality (breaks model by Zuythalma)

Within usage in practice and considering given current inaccuracies, the following eight TQM principles, based on the principles of E. Deming, were recognized as main principles. They are the following: orientation to the consumer; manager leadership; involvement of employees; the process approach; system approach to management; continuous improvement; decisions based on facts; beneficial relationship with the supplier.

However, according to the authors, all of these principles in the production process have different level of importance. Since the production of condensed canned milk with sugar and fruit-berry syrups is a complicated technological process that focuses on the consumer, the authors recommended to consider two basic principles of tion. Therefore, review of its product policy considering innovative concepts nutrition appears to be very important for the dynamic development of the industry.

Considering needs of different categories of consumers and their desire for healthy food, in developing a new generation of canned milk producers primarily should pay attention to the correlation of their chemical composition by the carbohydrate, vitamins and minerals.

Results and Discussion. According to the principles of food combinatory [4] to supplement nutritional deficit and balance the chemical composition of the CCM with sugar for dairy industry the usage of raw fruits and berries, including syrups is promising approach [5].

Considering above mentioned, it is clear that the main TQM requirements treat consumers as a member the process of creating high quality products. Therefore, leaders of dairy plants, accumulating needs of the consumer, should organize optimal operation of the system to achieve the purpose equally approaching to the needs and wishes of external customers and their employees who are internal consumers. At the examined standpoint CCM quality production becomes important from position of "focus on the consumer."

The quality of the product according to customer needs in full measure can be estimated via consumer expectations architecture (Fig. 2).

Permanent differences in consumers quality assessment of CCM and producers, caused by "breaks" in the chain "producer - consumer", does not allow to analyze this architecture completely at high professional level. The cause of this phenomenon is an inaccurate perception of the consumer expectations by management of dairy plant. Comprehensive solution of this question can be achieved via Zeythalm's breaks model (Fig. 3) [6].

To avoid these breaks in the relationship with the consumer permanent focus on their needs and expectations, which should be accurately tracked via means of questionnaires and personal contacts is strongly required. To avoid organizational breaks proper control of the whole process chain of interaction "producer - consumer", with clear idea of the scheme of this chain, should be in place.

Systematic approach to focus on the needs of the consumer begins from collection and analysis of complaints and complaints in retail points of retail chains and other places selling canned milk, which is required to prevent such problems in the future. During the application of TQM information on complaints and suggestions should come regularly from many sources and to be integrated into the process that allows

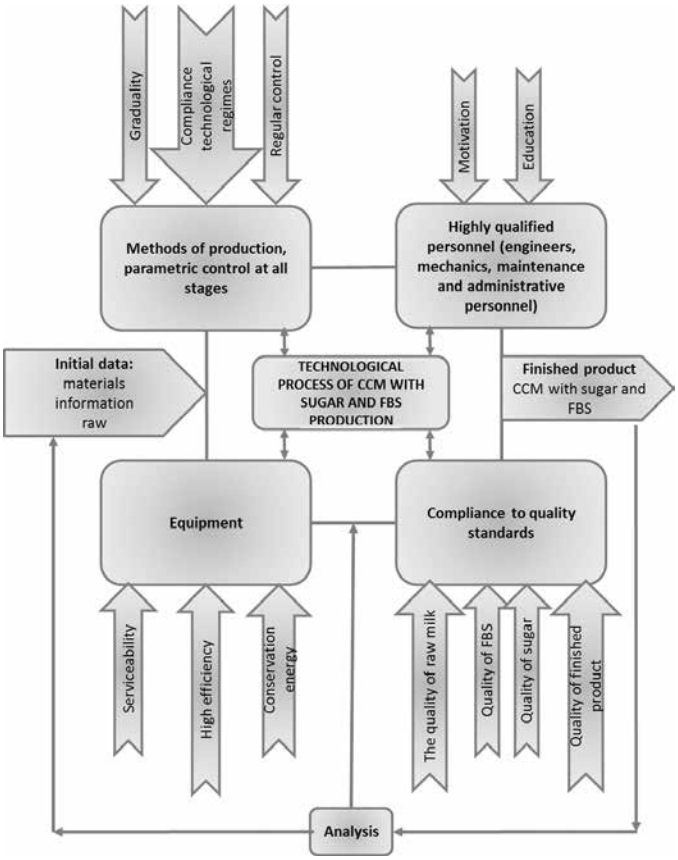

Fig. 4. The model of the production CCM with sugar and FBS

to obtain exact and reasonable conclusions about the needs and desires of a particular consumer and market.

Process approach. The importance of this principle appears since technology of CCM with sugar and FBS is a complicated industrial-technological mechanism that consists of many operations that influenced by a large number of important factors.

Necessary resources (milk, sugar, fruit-berry syrups) and technological operations in which they are involved should be treated as a single process in order to achieve best results.

The technological process of production is a combination of interdependent and interrelated resources (personnel, equipment, methods and sequence production standards) and activities that transform incoming raw materials to the finished high quality product [7]. The model of the production process is showed on Fig. 4.

It is known that the process model consists of a set of mini-processes, participants of which are structural units and managers of dairy plant. In this regard, under the mini-process means a series of different activities creating a result that has great value for the enterprise, consumer and customers. There are the following types of mini-processes: servicing, on the basis of which execution of the functions of the current production and management of the activities of plant are performed.

In general principle of the process approach is implemented in such actions as: setting and measurement "entrance" and "exit" of the process; coordination of the process with the functions of the company; assessment of possible risks; clear distribution of competences, responsibilities and accountability in managing; definition of internal and external customers and suppliers; concentration of attention in the process of deciding on the stages of the production cycle, flows, measurement tools, training needs, equipment, methodology, information, materials and other resources [2].

Quality of condensed canned milk with fruit-berry syrups production process is characterized by effectiveness, efficiency and flexibility.

The effectiveness of process expresses the degree of compliance produced CCM of quality with planned. It is achieved by the quality and coordination of the process, punctuality and time of orders fulfilling (lead time).

The efficiency indicates the level of allocated resources usage. It is estimated via ratio of process resources output to input.

Flexibility (elasticity, adaptability) is an adaptation to the changes in production conditions due to external and internal unplanned factors. It is achieved by optimization of the process either by fast response to the changes in requirements of the consumer market.

During the process approach, dairy plant should determine the design, manufacturing and supply processes of products. Meeting of customers' needs is achieved via process control. Next stage of TQM concept is optimizing of resources usage in each selected process. This

means the strict control of each type of resources usage and search of opportunities for reduction of production costs of CCM with sugar and FBS.

Conclusion. Summarizing all the above mentioned, it can be concluded, that the full and effective implementation of the TQM concept of production environment in dairy plant has several advantages, among which the main are the following: increasing of the customer satisfaction; improvement of the quality and competitiveness of the CCM with sugar and FBS; increasing productivity; improvement of management decisions quality; improvement of the image and reputation of the company; increasing of realized CCM volumes and profits; ensuring the rational usage of all resources.

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Параметри визрівання білкової маси у технології м'яких пробіотичних сирів

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Анотація. *Наведено результати експериментальних досліджень процесу визрівання білкової маси, отриманої із пермеату, збагаченого фруктозою, заквашувальними композиціями із бакконцентратів лакто- й біфідобактерій безпосереднього внесення з підвищеними пробіотичними й протеолітичними властивостями. Обґрунтовано параметри визрівання білкової маси у технології м'яких пробіотичних сирів: температура (11-13) °С, тривалість 20 діб.*

Ключові слова: *визрівання, білкова маса, біфідобактерія, лактобактерія, пробіотичні властивості, кислотність.*

THE OPTIONS OF MATURATION OF A PROTEIN MASS IN THE TECHNOLOGY OF PROBIOTIC SOFT CHEESE.

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Abstract. *The results of an experemental research of the process of maturation of a protein mass, which is recieved from permeate, enriched with fructose, leaven compositions from bakkontsentrativ lakto- and bifidobacteria of a direct making with higher proteolytic and probiotic features are given in this work. The options of maturation of a protein mass in the technology of probiotic soft cheese are grounded: temperature (11–13) °C, duration of 20 days.*

Key words: *maturation, protein mass, bifidobacteria, lactobacilli, probiotic properties, acidity.*