

Artículo de investigación

Lean production management: Accounting and cost control in processing enterprises of the consumer cooperation system**БЕРЕЖЛИВОЕ УПРАВЛЕНИЕ ПРОИЗВОДСТВОМ: УЧЕТ И КОНТРОЛЬ ЗАТРАТ В ПЕРАРАБАТЫВАЮЩИХ ПРЕДПРИЯТИЯХ СИСТЕМЫ ПОТРЕБИТЕЛЬСКОЙ КООПЕРАЦИИ**

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Lean production and management in the system of consumer cooperation remains one of the most difficult problems both in general in all areas of production and in milk processing. A modern solution to this problem, increasing the efficiency of production, improving its quality and reducing cost is the basis of principles and tools that are reflected in the lean manufacturing system. Lean management is possible on the basis of optimal cost accounting and management of dairy production, by reducing losses on waiting, overproduction, transportation, unnecessary processing steps, unnecessary movements, production with broken technology, defective packaging, unnecessary stocks - by regulating business processes and mobilizing internal reserves in the activities of processing enterprises of the consumer cooperation system. The subject of the study is managerial activity in the lean production and processing of milk in enterprises

Аннотация

Бережливое производство и управление в системе потребительской кооперации, остается одной из самых сложных проблем, как в целом по всем направлениям производства, так и по переработке молока. Современное решение данной проблемы, повышение эффективности производства продукции, улучшение ее качества и снижения себестоимости лежит в основе принципов и инструментов, которые нашли отражение в системе бережливого производства. Бережливое управление становится возможным на основе оптимального учета затрат и управления производством молочной продукции, путем снижения потерь на ожидание, перепроизводство, транспортировки, лишних стадий обработки, ненужных перемещений, выпуска с нарушенной технологией, дефектной упаковки, лишних запасов - путем

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of the consumer cooperation system. The aim of the study is the introduction of advanced and necessary methods of accounting and management of milk production in the enterprises of the consumer cooperation system. In accordance with this goal, the main task was determined: to develop recommendations for improving the accounting and management methods to reduce all kinds of costs and increase the productivity of dairy production. Performance management is an important financial and economic indicator of production in the system of consumer cooperation. This paper analyzes various aspects of lean manufacturing, accounting, control and management, taking into account the technological features and business processes of the consumer cooperation system. It is concluded that for the efficiency of the accounting process in the lean management system of a milk processing enterprise, it is necessary to build a system of accounting and control support, which will allow for detailed accounting of production costs for all objects of accounting and control.

Keywords Lean management, milk processing, accounting.

Introduction

The emergence of market relations to a new level of development, recovery after a serious test caused by the economic crisis for all forms of ownership and types of management suggest the use of new progressive economic methods for managing the production of dairy products in the system of consumer cooperation (Ostaev and others, 2018a).

Lean production management is the introduction of approaches and methods aimed at reducing all kinds of costs and increasing production productivity (Ostaev and others, 2019).

регулирования хозяйственных процессов и мобилизации внутренних резервов в деятельности перерабатывающих предприятий системы потребительской кооперации. Предметом исследования является управленческая деятельность при бережливом производстве и переработке молока в предприятиях системы потребкооперации. Целью исследования является внедрение прогрессивных и необходимых методов учета и управления деятельностью по производству молока в предприятиях системы потребительской кооперации. В соответствии с указанной целью была определена основная задача: выработать рекомендации по совершенствованию учетно-управленческой методики на уменьшение всевозможных издержек и увеличение производительности производства молочной продукции. Эффективность управления деятельностью является важным финансово-экономическим показателем производства продукции в системе потребительской кооперации. В настоящей работе проанализированы различные аспекты бережливого производства, учета, контроля и управления с учетом технологических особенностей и бизнес процессов системы потребительской кооперации. Сделан вывод о том, что для эффективности учетного процесса в системе бережливого управления молокоперерабатывающим предприятием, необходимо построение системы учетно-контрольного обеспечения, которая позволит вести детальный учет затрат на производство по всем объектам учета и контроля.

Ключевые слова: бережливое управление, переработка молока, учет.

Changing the entire production system in the complex, according to the proposed principles of lean production management, will reduce not only costs but also internal losses, while additionally we get free labor and other resources (Ostaev and others, 2018a; Ostaev and others, 2018b).

The problems of managerial accounting, lean manufacturing, management, analysis and business performance are highlighted in the works of domestic scientists and economists (Alborov, Kontsevaya, 2019; Alborov R.A., Kontsevoy G.R., 2017; Alborov and others,

2017; Alekseeva, Sokolov, 2019; Akhmetzyanov, Markovina, 2013; Gogolev, Rylov, 2018; Gogolev, 2018; Kondratiev, 2018, Kondratiev and others, 2017; Lvov, 2003; Mukhina, Markovina, 2014); however, separate accounting and management approaches and methods need to be developed and supplemented.

Materials and Methods

Efforts of lean production management are based in the form of business processes that do not increase the cost of products from the point of view of the consumer and, accordingly, do not increase the added value for the enterprise of the consumer cooperation system (Ostaev and others, 2019). The concept of introducing lean production in the consumer cooperation system is presented in Figure 1.

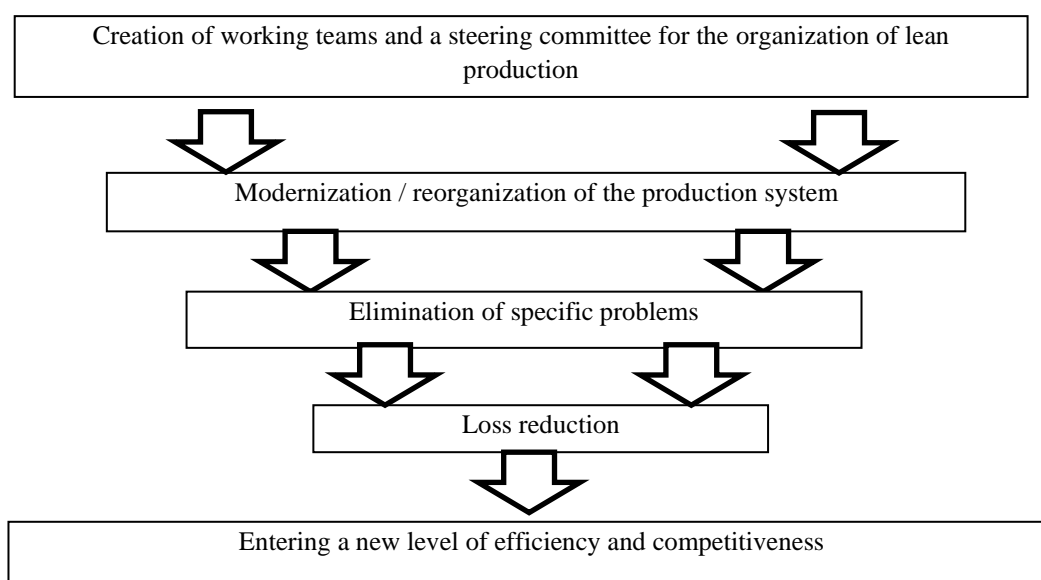


Figure 1. The concept of introducing lean production at the enterprises of the consumer cooperation system

Savings on basic materials, auxiliary materials, energy, and other costs are taken into account when calculating the savings from cost reduction as a result of the introduction of the basic tools of lean manufacturing and improving the operation of the applied equipment and technology (Selezneva, Selezneva, 2017).

The introduction of the concept of lean production provides an additional effect both for the enterprise of the consumer cooperation system and for the state budget (Kislitsky, 2018).

The production and processing of dairy products in lean production in the consumer cooperation system are several interrelated technological operations. For example, the objects of cost accounting based on the study of the technological process of production, which include several enlarged technological stages of the production of finished dairy products (Figure 2).

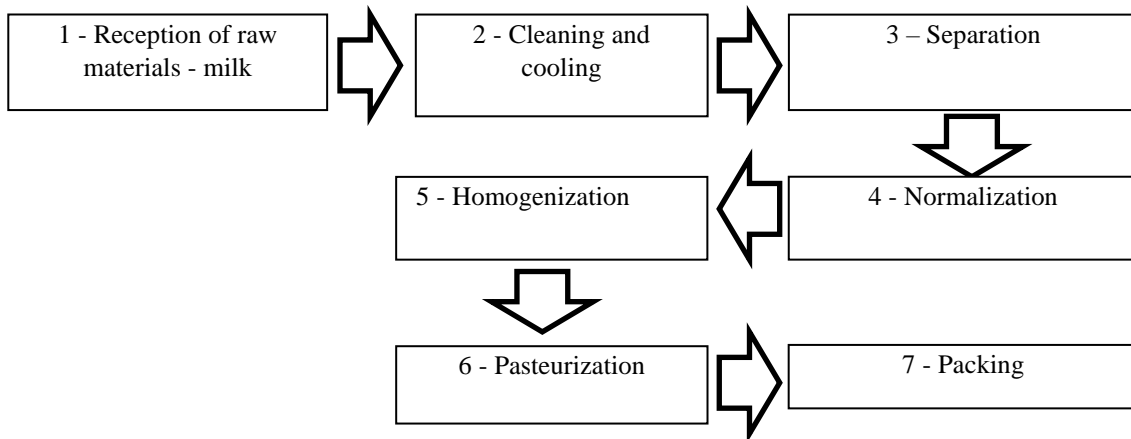


Figure 2. Objects of cost accounting for the technological stages of milk production

The objects of accounting and cost control for the technological stages of dairy production are highlighted taking into account the groups of

semi-finished products and finished dairy products with lean production management (Figure 3).

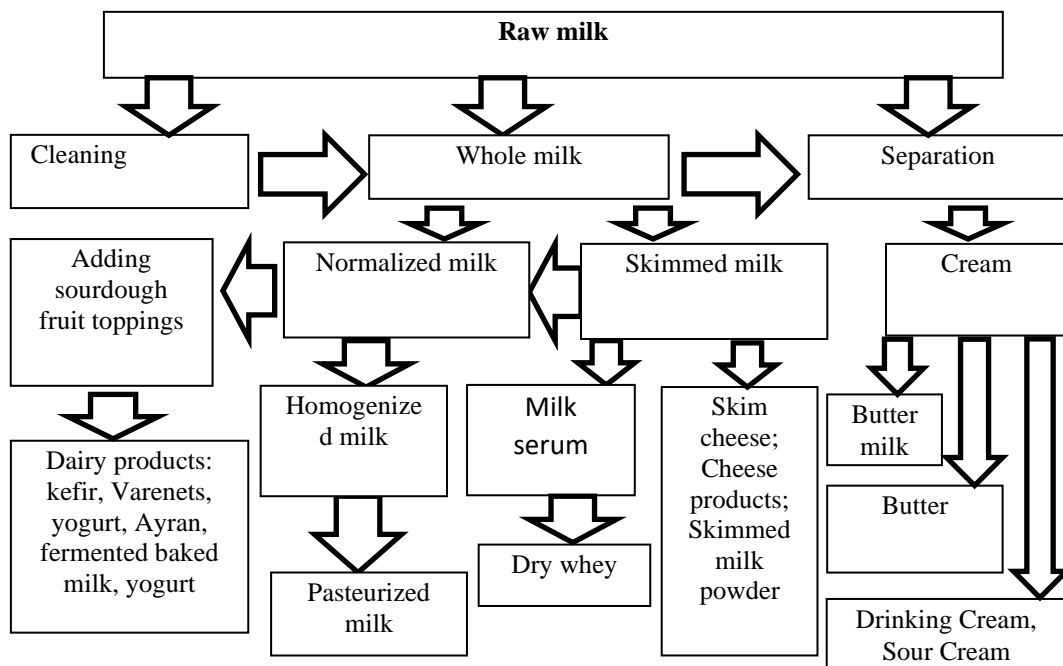


Figure 3. Accounting objects for technological operations of milk processing production and finished product groups with lean production management (developed by the authors)

Results and discussion

The economically sound definition of objects of accounting and cost control is an important aspect in the development of a lean management system, control and planning in the dairy industry of the consumer cooperation system. At enterprises engaged in the production of finished

dairy products of the consumer cooperation system, the classification and nomenclature of metering objects will depend on the specialization of dairy production, raw materials, processing technology, product name, packaging and other factors (Selezneva and others, 2016).

At dairy enterprises, the organization of main production has features that are explained by the specifics of raw materials, technological processes of production, the means of labor used, and also the level of mechanization and automation of production processes (Shlyapnikova and others, 2012).

The accounting system used at milk processing enterprises based on the "Methodological recommendations for the accounting of production costs and calculating the cost of production (work, services) in milk processing organizations" does not allow us to navigate in the conditions of development of lean management for production purposes. In full, it does not solve all issues in making managerial decisions, forecasting, control, analysis and accounting of products.

Milk processing at the enterprises goes through a certain technological sequence that affects the cost accounting procedure (Khaimanov and others, 2018).

In the hardware workshop, natural milk and cream are brought to standard fat content, pasteurized and transferred to the bottling site. The result is a semi-finished product of our own production, which is sent to the workshop for further processing. At this stage, the cost of the costing unit is not calculated, and all costs in the context of articles are transferred to another workshop.

At the bottling site, milk or cream is poured into bags and bottles. The result is products that are ready for sale. The costs of semi-finished products received from the hardware workshop in terms of costs are added to the cost of bottling.

Kefir, yogurt, fermented baked milk, yoghurts produce and pack finished products on the site of fermented milk products. The cost of semi-finished products from the hardware workshop is added to the costs of fermentation, the addition of flavorings and fillers (berries, cranberries, raspberries, currants collected in orchards and forests), as well as the filling of dairy products.

Finished products are obtained at the cottage cheese site: cottage cheese, curd and curd mass and whey. The costs of fermenting the skim and making cottage cheese are added to the cost of the semi-finished product from the hardware workshop. From the costs received, the cost of the returnable waste (serum) is subtracted in the accepted estimate.

The technological process for the production of dairy products consists of several stages of processing raw materials and semi-finished products obtained in the processing process, so enterprises usually use the alternate method. The stages of the technological process, as a result of which semi-finished products or finished products are produced, are a redistribution. The essence of the alternate method is that the object of cost accounting is redistribution, within which accounting is carried out according to calculation items and types of manufactured products.

In fact, the prevailing costs are distributed between the types of products in proportion to the cost standards calculated on the actual output.

Dairy production and milk processing are complex accounting objects (Figure 4).

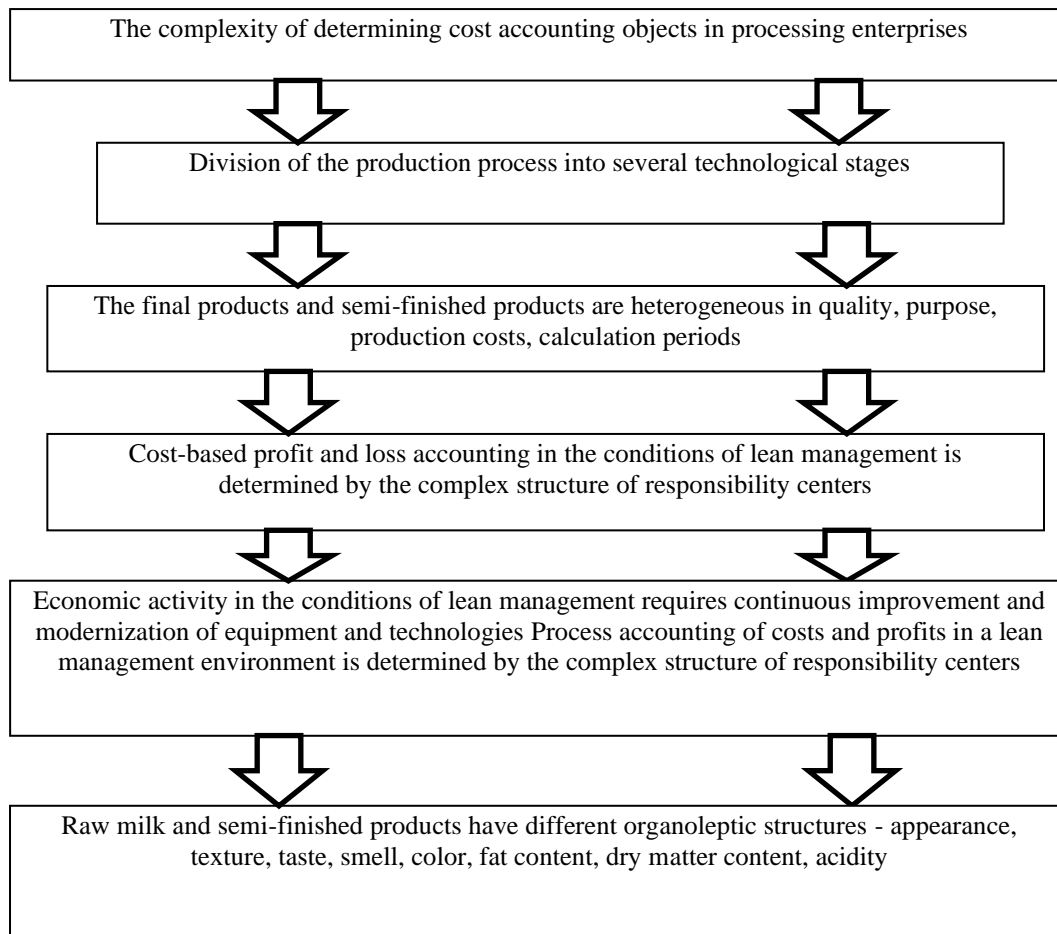


Figure 4. The reasons for the difficulty of determining the objects of cost accounting in the milk processing industry

To calculate the unit cost in the dairy industry, a calculation method developed by the Research Institute of the Dairy Industry in 1996 is used.

After a detailed analysis of the technology and organization of production at each stage of the

milk production and processing process, we identified signs by which the stages of the technological process should be determined for the purpose of lean management of dairy production (Figure 5).

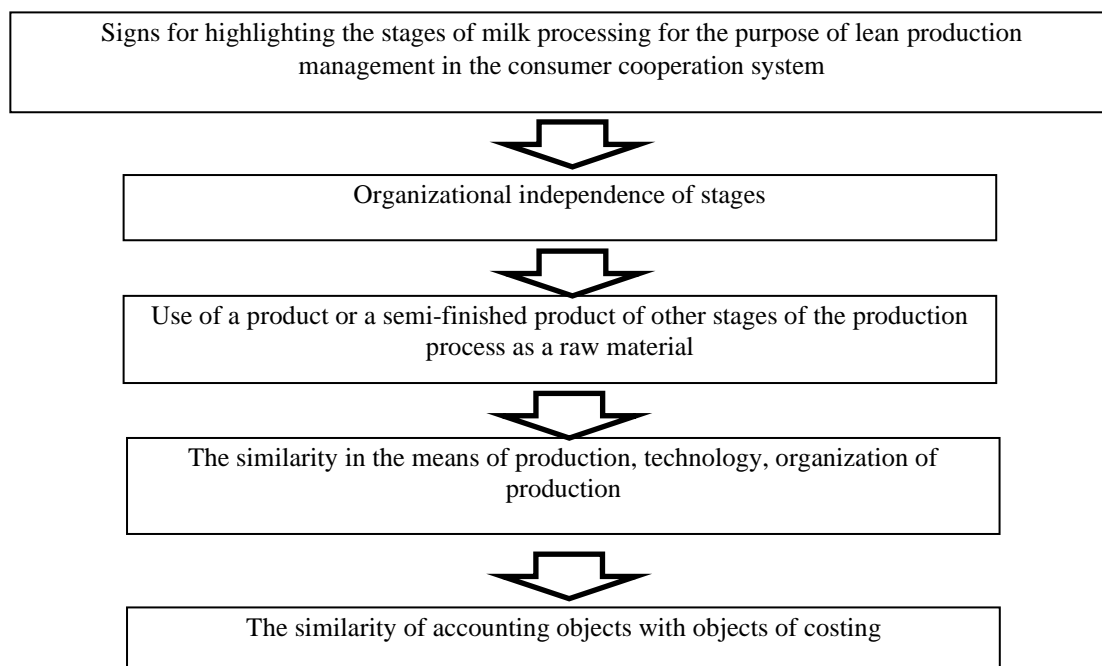


Figure 5. Signs of determining the technological stages for cost accounting in lean manufacturing and management (developed by the authors)

Milk processing enterprises of the consumer cooperation system with lean production and

business process management should have the following production structure (Figure 6).

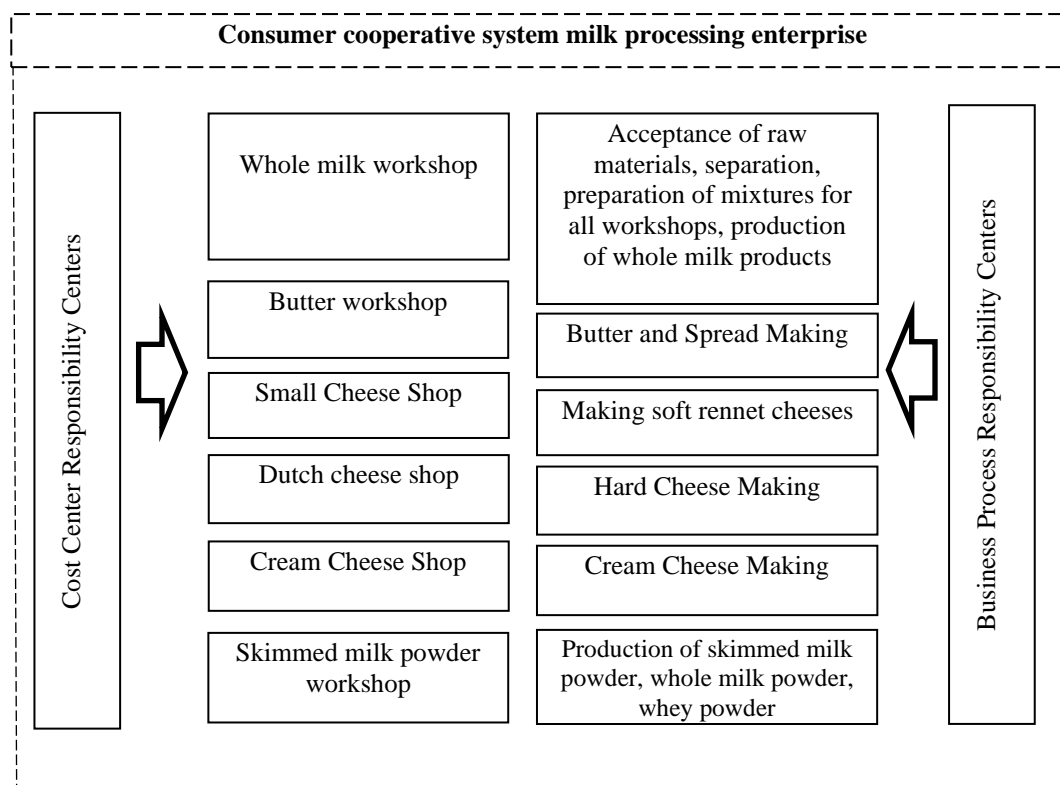


Figure 6. Objects of accounting and cost control based on the allocation of production and organizational units of the enterprise for lean management and production (developed by the authors)

With lean production and business process management, a thorough economic assessment of each production site (redistribution), various stages leads to the maximum detail of accounting and calculation of costs in the production of dairy products, which will allow more efficient control over direct and overhead costs. In addition, it is advisable to keep track of costs for business

processes (lines of activity) of the milk processing enterprise.

Particular attention to dairy enterprises in the conditions of lean management needs to be paid to quality costs, for which we recommend controlling them in separate articles, which are grouped in table 1. In conditions of competition in the dairy market, it is quality indicators that determine consumer demand.

Table 1. Grouping of costs for quality assurance in the production of dairy products

No	Raw milk processing costs.	Dairy production costs.
	On the control	
1	to ensure the quality and safety of feedstock; —	to ensure the quality and safety of feedstock; —
	to conduct veterinary and sanitary examination of the feedstock; —	to conduct veterinary and sanitary examination of the feedstock; —
	on storage of raw materials; —	to transfer to the production of raw materials; —
	on the maintenance of the sanitary-technical condition of the premises and equipment; —	to ensure the safety and quality of raw materials - milk; —
	to protect the production and the environment; —	to ensure the safety and quality of finished dairy products and semi-finished products; —
	to the laboratory and testing; —	storage and marketing of finished products; —
	- to check the completeness of the accompanying documentation. —	to protect industrial, including personal hygiene and the environment; —
		to the laboratory and testing; —
2	Correction and alteration of defects identified during the manufacturing process	- to check the completeness of the accompanying documentation. —
	for wages, for technological needs, for packaging, storage, transportation, etc.	

* developed by the authors

In addition, when calculating the cost of dairy products, the cost of raw materials excludes the cost of returnable waste or secondary dairy raw materials, which the consumer cooperation system enterprise can use to produce products.

We propose to group costs according to individual characteristics, both by places of occurrence of costs, and without attribution by places of occurrence (Figure 7).

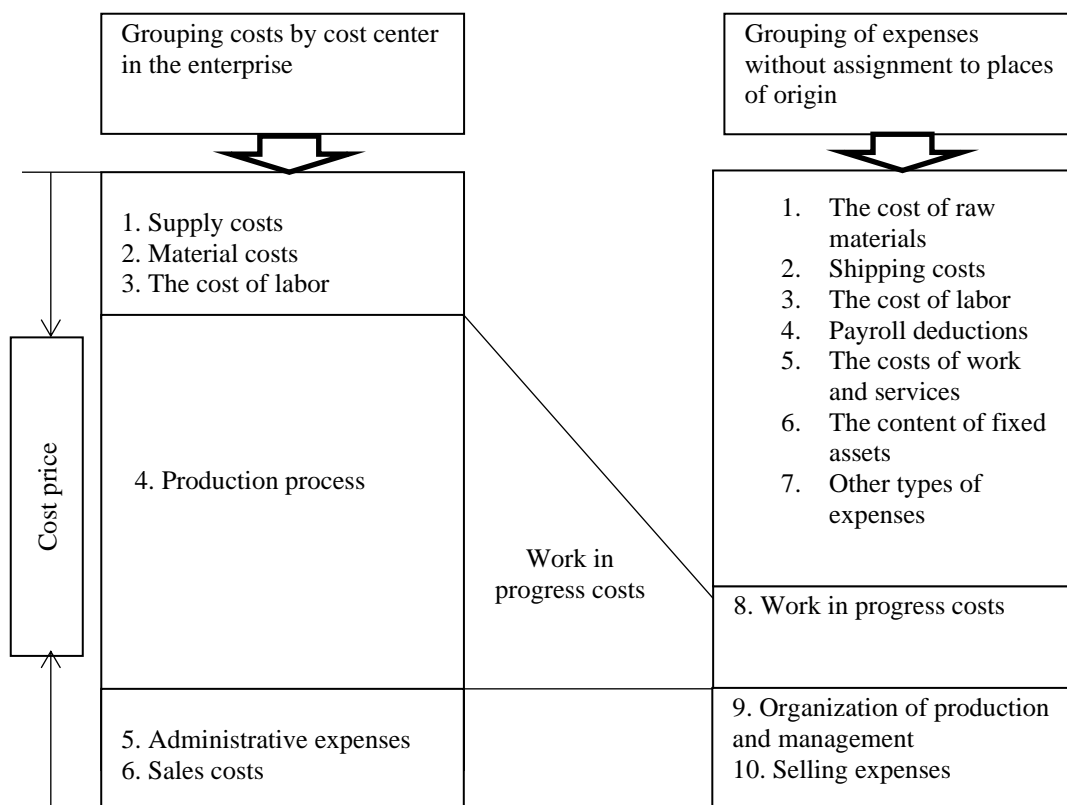


Figure 7. Directions of planning, accounting and cost management of lean management of dairy production (developed by the authors)

The proposed scheme allows for management accounting and cost management in a lean production management system:

- 1) On the elements of costs and stages of the reproduction process, while attention is paid to the allocation of production costs to the places where the costs arise (repartitions);

- 2) Allows the company to take into account the costs of calculation items.

From the point of view of the functional structure of cost management, it can be noted that the main elements of cost management are planning, analysis, organization of accounting and control, taking into account the principles of lean production management.

Table 2. Cost management scheme in a lean production management system

No Lean Production Management				
Cost Management in a Lean Management System				
No	Goals	Objectives	Methods	Practical implementation
1	1. Achieving the target results of the financial and economic activities of the enterprise in a lean management system, through cost optimization by responsibility centers, types of costs, types of products, orders.	1. Cost planning for centers of responsibility, by type of product, orders, processes. 2. Management accounting of costs. 3. Cost analysis. 4. Calculation and analysis of deviations of actual costs from normative (planned).	1. Classification of costs. 2. The division of costs into fixed and variable. 3. Management accounting in a lean environment. 4. Operational cost analysis. 5. Budgeting. 6. Factor analysis.	1. Cost control by responsibility centers, by type of cost, by type of product. 2. Budgeting by responsibility centers. 3. Making managerial decisions in the conditions of lean management - prices, volume of production.
2	Responsible persons for the practical implementation, goals, objectives, methods 1. General Director. 2. The financial director. 3. Chief accountant. 4. Head of the planning and economic department 5. Responsibility center managers.			

The effectiveness of the lean cost management system largely depends on the organization of cost control, their analysis, which, in turn, is determined by the following factors:

- The form and methods of cost accounting at the enterprise of the consumer cooperation system;
- The degree of automation of the accounting and analytical process;
- The state of planning and rationing the level of operating costs;
- The availability of appropriate types of daily, weekly and monthly internal

reporting on operating costs, allowing to identify deviations, their causes and promptly take corrective measures to eliminate them;

- The presence of specialists who are able to competently analyze and manage the process of cost formation.

The control system, which ensures the completeness and correctness of future actions aimed at reducing costs and increasing production efficiency, is of great importance in the lean management system.

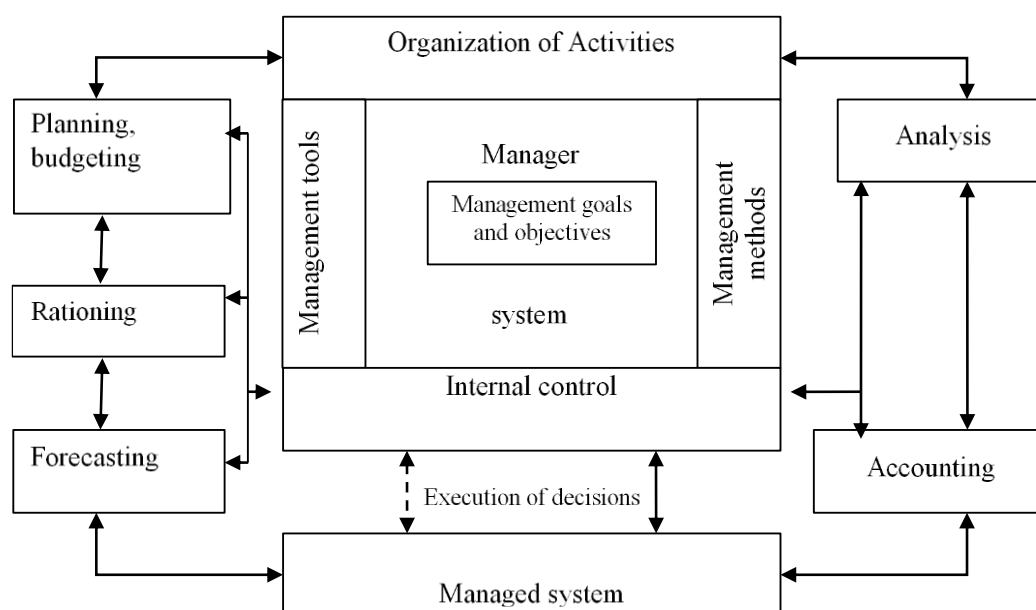


Figure 8. The relationship of functions in the lean management system of the enterprise consumer cooperation system in the implementation of control. Control as a system of functional impact and a management tool should be carried out in milk processing enterprises of consumer cooperatives, taking into account all factors, for the purpose of efficiency of lean production.

Conclusions

In the system of consumer cooperation, money should go to the development of a system of harvesting, processing of agricultural products. Consumer societies can receive grants for the creation, expansion or modernization of the material and technical base. This is provided for by a government decree that amended the State Program for the Development of Agriculture of Russia for 2013-2020. Today's market is designed so that 95% of manufacturers are focused on minimizing costs, but at the same time, one should not forget about the quality of dairy products. In the consumer cooperation system, the quality of dairy products depends not only on the technological features of the products, but also on the raw materials (milk) used as additives (berries, fruits), since these ingredients are mainly procured on their own.

Thus, it is necessary to build a system of accounting and control support, which will allow for detailed accounting of production costs for all objects of accounting and control, for the effectiveness of the accounting and management process in the lean management system of the milk processing enterprise of the consumer cooperation system.

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