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ЖАҒДАЙЫНДАҒЫ ТҰРАҚТЫ
ЭКОНОМИКАЛЫҚ ДАМУ
ПАРАДИГМАСЫ:
СЫН-ҚАТЕРЛЕР, САЛДАР,
МҮМКІНДІКТЕР»**

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В сборнике рассматриваются актуальные вопросы современной экономики: бизнес-технологии в контексте устойчивого развития, цифровая трансформация финансово-учетной системы, новые тренды управления в турбулентных условиях, стратегические приоритеты развития экономики. Рассчитан на широкий круг читателей, руководителей, преподавателей и обучающихся.

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ALGORITHM FOR ACCOUNTING LOGISTICS COSTS AT DAIRY INDUSTRY ENTERPRISES

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Annotation . The dairy industry plays a key role in meeting the population's needs for high-quality dairy products. However, with increasing competition in the market and rising costs of logistics operations, it is becoming increasingly important for enterprises in this industry to effectively manage logistics costs. In this context, the development of an algorithm for accounting logistics costs in dairy industry enterprises is a pressing research problem.

The purpose of this article is to develop an algorithm for accounting for logistics costs at dairy industry enterprises in order to optimize logistics processes and reduce overall costs. Specific research objectives include:

Analysis of the features of logistics processes at dairy industry enterprises.

Development of accounting methods and algorithm for optimizing logistics costs.

Assessing the effectiveness and potential of using the algorithm in a competitive environment.

It is expected that the developed algorithm will allow dairy industry enterprises to improve the management of logistics costs, reduce time and financial costs, and also increase the efficiency of production and customer service. The results of the study can be useful both for practical specialists in the field of logistics and for the scientific community dealing with the problems of optimizing production processes in the dairy industry.

The article reflects the results of a theoretical study to identify the essence of the categories "logistics costs" and discusses the results of a theoretical study of the features of the formation of logistics costs and the accounting algorithm at dairy industry enterprises. The efficiency of organizing and keeping records of the costs of production and sales of products (works and services), the reliability of the assessment of work in progress and finished products, the determination of indicators of the cost of production of works, services and financial results from the usual activities of the organization largely depends on the classification of costs. Therefore, it is necessary to know the economic content of production costs and, based on this, classify them in accordance with their group affiliation.

Keywords. Logistics costs, classification of logistics costs, dairy industry costs, cost accounting.

Introduction. In the context of sustainable development of the country, modern companies are in a state that requires continuous, continuous development, improvement, and increased efficiency.

The task of the current stage is to form the prerequisites for sustainable development, which will require additional costs, including logistical ones. On the other hand, logistics activities can have a negative impact on the socio-economic sphere and the ecosystem, which causes additional costs for economic entities. The formation and development of a logistics cost optimization system is determined by the degree of dependence of an economic entity on procurement, in-house, sales, transport, warehouse and information logistics, inventory and order management systems.

The formation and improvement of the logistics cost management system is a prerequisite for ensuring sustainable and balanced development of economic entities in the agricultural sector.

One of the main ways to achieve this goal and maintain competitiveness, as well as one of the main factors for successful strategic planning and sustainable development of the agro-industrial complex is a competent analysis, accounting for logistical costs and full optimization of material flow costs while maintaining the quality of products. Logistics costs have a complex structure based on the total cost of production and circulation of products, while in agricultural production this quality is enhanced due to the close connection of the technological process. The accounting and management accounting tools currently used do not allow us to fully determine the level of

logistical costs, and their primary identification requires significant time and material resources. Since the logistics system is present in every business process, the importance of the logistics cost accounting algorithm is quite obvious.

Literature review.Currently, profitable relationships are formed in conditions of high competition, uncertainty and instability of the market environment. In order to achieve their goals, entrepreneurs, in addition to marketing approaches, need to apply modern effective methods and methods of business process management. In this regard, logistics and logistics costs are becoming relevant in modern conditions.

The logistics infrastructure is a complex system that must combine business structures providing transport, forwarding services, purchase and sale services, storage, etc. The purpose of modern logistics systems is the effective management of material and related flows based on effective cooperation with stakeholders and the introduction of modern technological solutions, which causes the occurrence of appropriate costs [1].

The problems of formation and development of a management system, an integral part of which is the element of accounting for logistical costs to ensure sustainable development, have been studied by scientists from different countries. Thus, V.I. Sergeev [2], P.R. Murphy, D.F. Wood [3], D.J. Bowersox, D.J. Kloss [4] paid attention to the issues of determining the role of logistics activities in modern economic activity, classification of logistics costs and their optimization.

The relationship between logistics activities and the results of sustainable development was studied by L.B. Mirotin, V.I. Sergeev [5], V. Albino [6], J.-P. Rodrigue, B. Slack, C. Comtois [7].

Theoretical and practical aspects of the peculiarities of the formation of logistics costs and their classification are reflected in the works of scientists: patronymic – K.T.Taygashinova, Zh.S. Raiymbekov, B.U.Syzdykbaeva and foreign – S.A.Pelikh, I.A.Yelova, I.I.Polishchuk, N.K.Moiseeva, O.M.Sumets, L.B.Mirotin, E.Tashibaeva, A.M.Gadzhinsky, M.Kufel.

Currently, the scientific and practical direction of logistics is increasingly of interest to the scientific community in the field of the formation of logistics costs in the agro-industrial complex.

The authors' approaches to the definition of the concept of "logistics costs" are discussed below in figure 1.

Raimbekov Zh.S., Syzykbaeva B.U.	<ul style="list-style-type: none"> Logistics costs are the monetary expression of the totality of expended material, labor, financial, and information resources of an enterprise related to the provision of business processes and operations for the movement of material flows within the logistics system.
M. Kufel	<ul style="list-style-type: none"> “Logistics costs are a category of costs that means the monetary expression of the use of enterprise property caused by the planning, execution and control (except for technological processes) of the movement in time and space of all forms of materials”
L.B. Mirotin	<ul style="list-style-type: none"> include the costs of labor resources, costs of material resources, costs of financial resources, costs of information resources, which are caused by the organization carrying out its business activities related to the fulfillment of orders received from consumers.
I.A. Elova	<ul style="list-style-type: none"> A significant part of logistics costs are transaction costs, i.e. costs associated with completing transactions in the supply chain
Gadzhinsky A.M.	<ul style="list-style-type: none"> Logistics costs are the costs of performing logistics operations
Frolova V.V., Shumakova O.V.	<ul style="list-style-type: none"> General logistics costs are the costs of implementation basic logistics functions (supply, production, sales), costs for information and computer support, financial transactions in the implementation of basic logistics functions, costs logistics administration, losses from tying up funds in reserves, damage from insufficient level of quality of logistics management and service

Figure 1. The authors’ approaches to defining the concept of “logistics costs”

Note: compiled by the authors based on sources [8, 9, 10, 11, 12, 13]

If, according to J. Stock and D. Lambert, marketing determines the required level of service, then logistics can provide it with optimal costs and economic attractiveness of capital. [14]

A.M. Gadzhinsky notes: “Organizing the accounting of logistics costs, the main task that logistics faces is to minimize the costs associated with the delivery of material flow from the manufacturer to final consumption.” [12]

According to N.K. Moiseeva: “Logistics costs are the sum of all costs, in particular the costs of storing incoming products, internal transportation, intermediate storage, storage of finished products, shipment, external transportation, as well as costs of personnel, equipment, premises, warehousing of stocks, transfer of data on orders, stocks, deliveries.” [15]

K.T. Taigashinova expresses her opinion: “Isolating logistics service costs in non-traditional management accounting is logistics costs. However, in modern conditions, cost accounting of logistics services is not carried out...” In his research, K.T. Taigashinova writes: “Reducing production costs is the main indicator in increasing an entrepreneur’s income. The development of a strict market strategy requires the perfection of the production process of production technology” [16, p. 90].

Investigating the costs associated with ensuring the logistics activities of an enterprise, L.B. Mirotin, Y.E. Tashbaev, O.G. Poroshina revealed the classification of logistics costs: “Logistics costs are the costs of labor, material, financial and information resources caused by enterprises fulfilling their functions for fulfilling consumer orders. The costs of enterprises included

in logistics costs are very diverse and are divided according to cost elements, functional areas and responsibility centers."

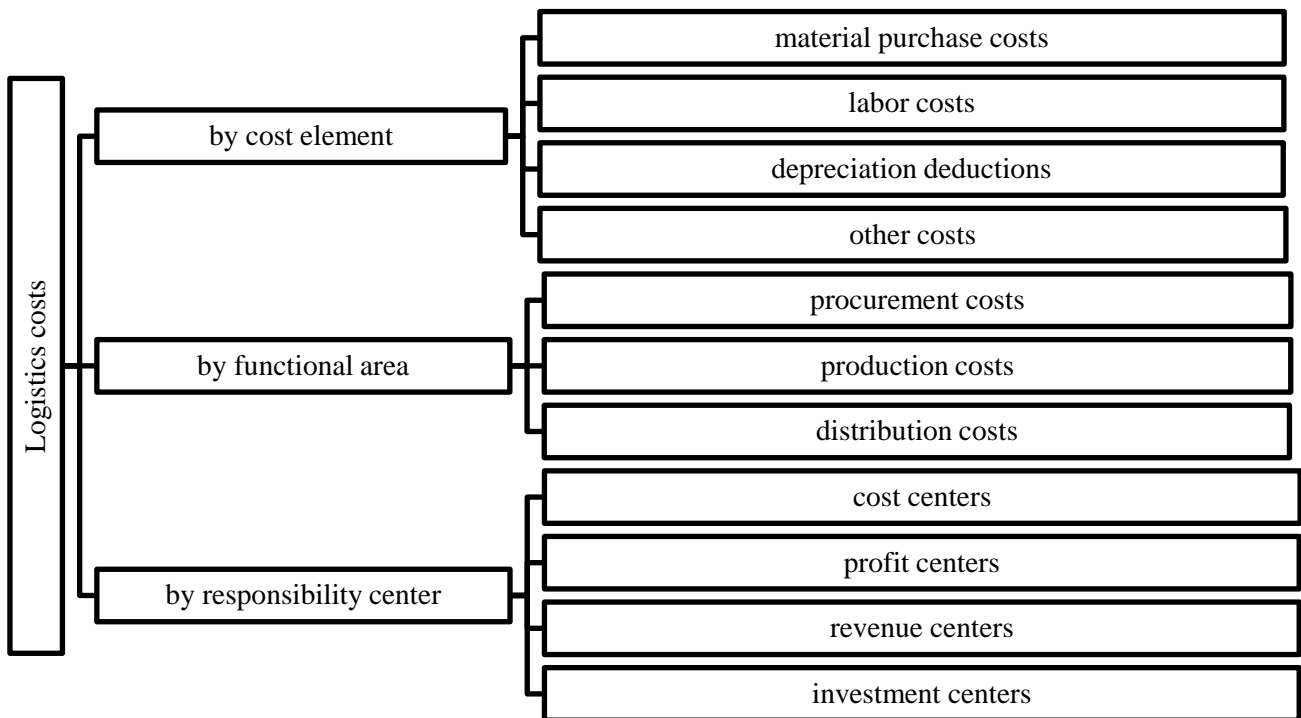


Figure 2 . Classification of logistics costs
Note: compiled by the authors based on source [10]

In Figure 2, the classification of logistics costs by functional areas, the authors write “sales costs”, in our country there will be sales costs, or sales costs, and in the Republic of Kazakhstan in the standard chart of accounts these costs are taken into account in account 7110 - “Sales costs”, regardless of sales, sales of products or sales of logistics services.

In general, in modern conditions in the economic literature, the problems of “accounting for logistics costs” in the entire field of activity, including in the dairy industry, have been little studied. In this regard, the relevance of demarcating integrated cost accounting with logistics areas is timely and beyond doubt.

Therefore, there is a need to identify a system for accounting for logistics costs, and link their classification with the classification of costs in management accounting.

Methodology. The research analyzed existing methods for accounting for logistics costs at dairy industry enterprises. This included a literature review, analysis of reports and publications, and interviews with logistics practitioners. The main parameters and variables affecting logistics costs in dairy industry enterprises were identified. This included the cost of transportation, warehousing, packaging, as well as factors such as distance, supply volumes and product characteristics. Based on the analysis, a cost accounting algorithm was developed that describes the relationship between parameters and logistics costs. And the algorithm for accounting for logistics costs will allow the enterprise to more effectively manage its logistics activities, reduce costs and increase competitiveness in the dairy industry market. Based on the resulting algorithm, it can be approved and tested on real data from dairy industry enterprises. As a result, its accuracy, reliability and efficiency are tested under various operating conditions.

Results and discussion. The classification of costs in traditional management accounting is very diverse and depends on what management problem needs to be solved. The main objectives of management accounting include:

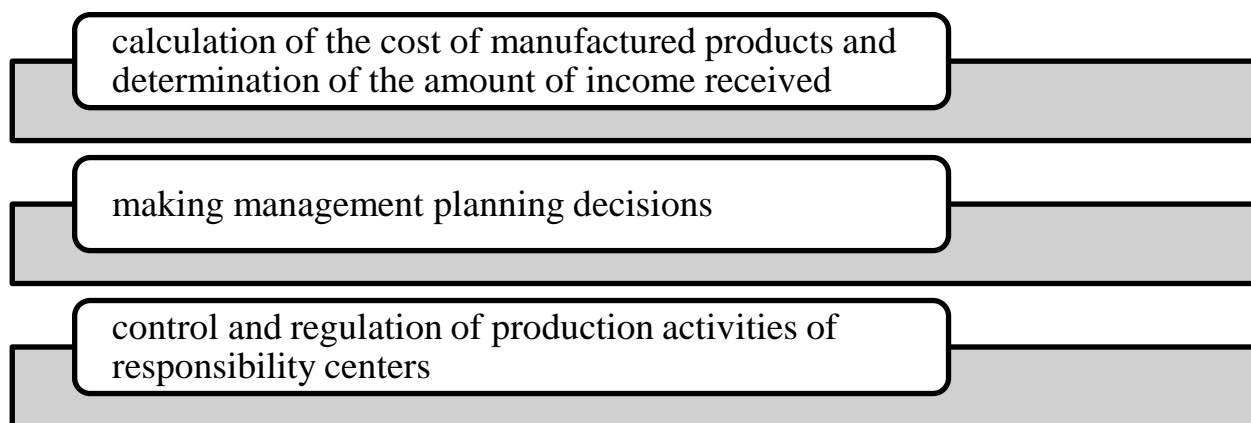


Figure 3 . Main tasks of management accounting

Note: compiled by the authors

The solution to each of the assigned tasks corresponds to its own classification: we can consider the classification of the 2nd and 3rd directions - this is the adoption of management planning decisions, control and regulation of the production activities of responsibility centers, which may well fit into the classification of logistics costs.

The cost of purchasing raw materials and supplies is an important cost center.

The basis for the distribution of logistics costs is the supply chain, which includes logistics functions from procurement to consumption. There are two options for assigning costs:

- to order;
- on the process (supply, procurement). [16, 121 p.]

The system for assigning costs to an order determines the costs for each selected order as it goes through the logistics process. These are transportation and procurement costs. An order is an information unit of logistics operations that goes through all stages of logistics transactions. The technological process of order fulfillment is a set of sequentially performed operations.

Based on a generalization of various literature sources, it is possible to propose a classification of costs in the dairy industry.

Table 1. Classification of logistics costs

Classification sign	Types of costs	Characteristic
<i>To determine cost and profit</i>		
By economic content	Cost elements	Includes means of labor, objects of labor and labor resources
	Cost items (costing)	Grouping of production costs by economic homogeneity, by target value (material costs, social contributions, labor costs, depreciation, and others)
By the method of attribution to the cost of production	straight	They can be directly included in the cost of specific types of products (works and services). Direct costs primarily include expenses for raw materials, basic materials, purchased semi-finished products, fuel and energy for technological purposes, for wages of production workers with corresponding charges
	indirect	Related to the maintenance and management of product production, product sales, and management of the organization as a whole
In relation to the production (technologica	Basic	Directly related to the technological process of manufacturing products, performing work, providing services (raw materials, supplies, depreciation, etc.)
		Formed in the course of servicing the production process,

l) process	Invoices	managing the activities of the organization's production divisions
By composition and degree of homogeneity	Single element (simple)	Homogeneous types of costs, such as, for example, wages, depreciation and others
	Complex	They include several types of costs: general business expenses include the cost of materials for general business purposes, salaries of management personnel, depreciation of buildings, etc. The grouping of costs by composition is identical to their division into elements and items
According to the expediency of spending	Production	Necessary to ensure the activities of an economic entity in accordance with the envisaged technologies, plans, estimates, norms and regulations
	Non-production	Indicate deviations from normal conditions of production and economic activity (losses from downtime, payment of overtime work, manufacturing defects)
<i>For planning, forecasting and management decision making</i>		
In relation to the volume of labor products	Permanent	They depend not on the volume of products (work, services), but on the operating conditions of the business entity, are associated with the very fact of the organization's existence and occur even in the absence of labor products (wages of management and service personnel, advertising costs, consulting, auditing and information services, for training and advanced training of personnel, other general business expenses).
	Variables	Costs, the value of which varies in proportion to the volume of products (works, services). Variables, as a rule, include the costs of raw materials and basic materials, wages of production workers, and other similar expenses
	Conditional variables (conditionally constant)	Contains both variable and fixed costs (fees for communications)
By frequency of occurrence (time of determination of facts)	current	Refers to the costs of production and sales of products in the reporting (planned, analyzed) period
	Deferred expenses (one-time)	Associated with the preparation of new production facilities, development of new products, reserving costs for purposes (payment of vacations, repair of fixed assets)
	periodic	Not directly related to the production process. They consist of commercial (expenses associated with sales and supply of products) and administrative expenses (expenses of enterprise management)
If possible and necessary planning	Planned	Comply with the requirements of the technological (production) process and the conditions of sale (sales) of products, works, services
	Unplanned	Indicate a violation of the normal conditions of the production process (losses from defects)
For the purposes of making management decisions	Relevant	Dependent on the decision being made
	Irrelevant	Inevitable under any solution
In relation to	Limit (margin)	Arise from the manufacture or sale of an additional unit of

the profitability of production		product
	Limit (margin)	Arise from the manufacture or sale of an additional unit of product
Based on reality	Real	Occurred and reflected in accounting
	Imputed	Lost profit of the organization
<i>for the purposes of control and regulation of cost levels</i>		
By responsibility center	Adjustable	Depends on the degree of control of the head of the organization's department
	Unregulated	Organizational divisions independent of the influence of the head of the organization
By degree of controllability	Controlled	Which can be controlled by the head of this responsibility center and which can be significantly influenced
	Uncontrollable	Which do not depend on the activities of the head of this responsibility center.
According to the expediency of spending	Limited (standardized)	This includes travel and hospitality expenses, advertising expenses, etc., the legislation establishes limits, norms and standards
	Unlimited	Accepted when calculating cost in actual amounts
<i>to determine the effectiveness of costs incurred</i>		
expenses that form income	Effective (profitable)	Generating income from product sales
	Ineffective (unprofitable)	Non-income generating (losses in production, defects)
	Current (required)	Necessary for normal operations
Note: compiled by the authors		

Each group of costs has its own independent economic significance and practical application. It should be taken into account that this classification for organizing accounting and cost control, calculating the cost of products according to some characteristics is of great practical importance, and according to others - less.

Logistics contributes to the success of an enterprise by providing consumers with products in a timely manner and in accordance with requirements. The logistics chain of the dairy industry consists of parts - supply management and demand management. The task is to process perishable raw materials in the shortest possible time and fulfill received orders daily.

Cost information obtained in management accounting is the basis for external and tax reporting. Logistics involves recording accounting for the entire flow, which makes it possible to show changes in the amount of costs as a criterion for the effectiveness of decisions made in the field of material flow management.

In management accounting, the phases of accounting for logistics costs should be distinguished.

The first phase is the emergence of costs from material, intangible resources, fixed assets, working capital, labor, and output. Material costs at a dairy industry enterprise come from:

- from the workshop, from the livestock division, through the warehouse, the main accounting document is the "Demand-invoice";
- alternative receipts - when the costs are the results of product output, the accounting documents are "shift production report", "Product output", "Item assemblage".

The second phase is storage, cost adjustment. In this phase, changes in analytical cost accounting may occur. Transfer of costs: raw materials, materials from one production order to another. Documents can be:

- “Adjustment of work in progress” (remains of products that have not gone through the full technological cycle, for example, raw milk);
- “Adjustment of other costs.”

During the storage phase, processes such as write-off and return of materials, raw materials and purchased goods can occur.

The third phase considers which asset or expense is generated by cost accounting.

Dairy production enterprises in their accounting policies determine a list of expense items, such as material costs, labor costs, deductions, depreciation charges, and other costs. Expenses are recognized as justified and documented expenses - expenses confirmed by documents drawn up in accordance with the law, or documents drawn up in accordance with the requirements of business turnover applicable in the territory of which the corresponding expenses were incurred, or documents indirectly confirming the expenses incurred (including customs declaration, business trip order, travel documents, report on work performed in accordance with the contract). As already noted, any expenses are recognized as expenses if they are incurred to carry out activities aimed at generating income.

All costs should be divided into interaction costs and conversion costs. Cost accounting is formed from a variety of costs that appear at the following stages:

Receiving an order;

Order Processing;

Preparation of documents for registration;

Order completion;

Storage and delivery;

Forwarding services;

Invoicing.

One important point is that expenses form the cost price, and expenses contribute to determining the total annual income.

Accounting for cost transactions, including accounting for logistics costs, is carried out in accordance with Law of the Republic of Kazakhstan No. 234 dated February 28, 20027. “On accounting and financial reporting” (as amended on 07/07/2021), [18] The accounting rules approved by order of the Minister of Finance of the Republic of Kazakhstan No. 221 dated 06/22/2007, [19] The standard chart of accounts for accounting, approved by the Order Minister of Finance of the Republic of Kazakhstan No. 185 dated May 23, 2007. [20] (section 7, accounts 7000-7710 are allocated for accounting for “expenses”, and section 8 of accounts 8000-8400 for expenses).

Accounting in agriculture is governed by International Financial Reporting Standard (IAS) 41 Agriculture (IFRS/IAS 41). This standard is applied to accounting for agricultural products (that is, products obtained from biological assets) only at the time of their receipt (collection). Subsequent accounting of finished products and their processing is carried out in accordance with the requirements of IAS 2 “Inventories” [21]

For management purposes, accounting organizes the accounting of expenses by cost items.

Planning, accounting and calculation of the cost of dairy products is recommended to be carried out using the following costs:

main and additional material resources;

transport and logistics costs for main and additional raw materials;

expenses and services of auxiliary production;

fuel and energy for technological purposes;

expenses for maintaining fixed assets;

wages of production workers;

contributions for social needs;

taxes, fees, other payments;

other costs;

general production expenses;

general running costs.

An algorithm for accounting for logistics costs at dairy industry enterprises is a necessary process when managing the agricultural process. The accuracy and timeliness of calculating the organization's performance indicators depends on how effectively analytical and synthetic cost accounting is organized. In this regard, the construction of an effective cost accounting system, which provides for grouping costs by elements and costing items, deserves special attention.

For the most effective integration of management accounting into specialized software systems, you can use a digital coding system, where the first two characters indicate the center of responsibility in accordance with the functional areas of business processes: 01-management, 02-sales, 03-supply, 04-main production, 05 -auxiliary production. The next two characters represent the codes of responsibility centers, allocated on the basis of the business processes carried out in the organization. The following symbols are the serial numbers of cost centers within the specified responsibility centers. If more detailed cost accounting is necessary, this classifier can be supplemented.

Table 2 – Classification of cost centers within the selected business processes of the dairy industry

Name of business processes	Name of the responsibility center and cost center	Accounting account	Responsibility Center
Primary activity			
Control	Administration	7210	01.01
	Accounting	7210	01.02
	Planning and Economic Department	7210	01.03
	Human Resources Department	7210	01.04
Sales	Marketing department		02.01
	Sales department		02.02
	Finished products storage warehouse		02.03
Supply	Purchase department	7110	03.01
	Warehouse for storing raw materials and supplies	7110	03.02
Primary production	Crop production	8111	04.01
	- Brigade No. 1		04.01.1
	- wheat production		04.01.1.1
	- production of industrial crops		04.01.1.2
	- brigade No. 2		04.01.2
	Livestock	8112	04.02
	- livestock farm		04.02.1
	Industrial production	8113	04.03
	- dairy plant		04.03.1
	-meat processing production		04.03.2
Support activities			
Auxiliary production	Mechanical repair workshops	8411	05.01
	Machine and tractor park	8412	05.02
	Car park	8413	05.03
	Electricity supply	8414	05.04
Note: compiled by the authors			

Cost accounting and calculation are necessary processes in the management of the dairy industry. The accuracy and timeliness of calculating the organization's performance indicators depends on how effectively analytical and synthetic cost accounting is organized. In this regard, the

construction of an effective cost accounting system, which provides for grouping costs by elements and costing items, deserves special attention.

When forming a nomenclature of cost items, one should take into account their specific weight, role in the formation of product costs, as well as their connection with production technology. To introduce progressive methods and management accounting systems, the nomenclature of items and cost elements in the dairy industry can be used in the following composition.

Table 3 shows the recommended nomenclature of costing items for organizing management cost accounting in the dairy industry, which will lead to the formation of the cost of dairy products.

Table 3. Cost accounting algorithm for calculating dairy products

Cost elements and costing items	Cost accounting and calculation of product costs	
	Overall for the organization	By responsibility center
<i>Direct material costs</i>		
Material costs:		
a) feed:		
- purchased, incl. concentrated;	*	*
- own production of previous years;	*	*
- own production of the current year;	*	*
- costs of maintaining a feed mill.	*	*
b) means of protecting animals from diseases (veterinary medicines);	*	*
d) fuel and energy for technological purposes;	*	*
D) auxiliary materials;	*	*
E) other services	*	*
<i>Direct variable labor costs</i>		
Labor costs:		
A) remuneration of key workers;	*	*
B) remuneration of workers engaged under civil contracts;	*	*
D) additional wages	*	*
D) Social insurance contributions	*	*
<i>Indirect costs</i>		
Maintenance of fixed assets, including herds:		
A) depreciation of fixed assets, including herds;	*	*
B) costs of repair and maintenance of fixed assets, including herds.	*	*
Other costs:		
A) works and services of auxiliary production;	*	*
- fuels and lubricants;	*	*
- repair of mechanical workshops, vehicle fleet;	*	*
- energy supply;	*	*
- water supply;	*	*
- other productions.	*	*
B) AUP salary;	*	*
C) insurance premiums of the AUP;	*	*
D) works and services of third parties;	*	*

D) Expenses for using loans and interest;	*	*
E) Rental (leasing) payments;	*	*
D) costs of standardization and certification of milk;	*	*
D) other costs.	*	*
<i>Business expenses</i>		
Logistics costs:		
A) costs of bottling and transporting milk;	*	*
B) costs of warehousing and packaging;	*	*
B) Cleaning and transportation costs;	*	*
C) expenses for selling milk, including advertising;	*	*
D) Salaries of employees in the logistics and transportation department;	*	*
E) Social insurance contributions for employees in the logistics and transportation department;		
D) other costs		
Basic expenses	*	* A. Cost generated by the responsibility center
Overheads	* B. Production cost	
Selling expenses	* B. Full cost	
Note: compiled by the authors		

This standard for the list of cost elements and costing items was reviewed from a modern perspective, structured, the components of cost elements and cost items were described in more detail, which made cost information more transparent.

The structure of the cost of dairy products is multidimensional and covers a large number of production and economic relations.

In the agricultural industry, they mainly use the traditional classification of costs by economic elements and costing items. This meets the requirements for planning and controlling costs and calculating the full cost of production, but does not provide the opportunity to obtain information about costs for making management decisions.

Conclusions.

One of the main problems in the development of the agro-industrial complex of the Republic of Kazakhstan is:

- lack of developed transport and logistics infrastructure (worn-out infrastructure, low railway capacity, shortage of wagons in season);
- high transport costs and logistical difficulties [23].

To solve these problems, it is necessary to improve the processes of planning and regulating the supply chains of agriculture, the development of logistics infrastructure, optimization of flow processes based on the management of total logistics costs at different levels of the economic system, including logistics service standards based on the greening of agriculture, production and processing of dairy products, the formation of an open information system for logistics processes.

In conclusion, the developed logistics cost accounting algorithm represents an important tool for optimizing the operation of logistics processes. Experiments have shown its high efficiency and potential for use in various industries. The advantages of this algorithm include accuracy of cost accounting, flexibility of customization to meet the specific needs of the enterprise, and the ability to automate logistics management processes. It is recommended to actively implement the algorithm in practice in order to improve the management of logistics operations and reduce overall costs. Further research in this area will expand the functionality of the algorithm and increase its efficiency in a rapidly changing logistics environment.

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