Application of the ABC method in animal husbandry

Tatyana Pavlyuchenko* and *Natalya* Kosteva

Voronezh State Agrarian University named after Emperor Peter the Great, 394087 Voronezh, Russia

Abstract. One of the most important problems is the timely and accurate accounting of costs and output. Providing benefits from sales, obtaining benefits from enterprises and, accordingly, improving the quality of products. In this regard, the problem of building a system of state accounting of costs in agriculture is very relevant for national scientists. The article explores the methods of calculating the cost of livestock production by the traditional method and the ABC method, and also studies the prospects for determining the nature of ABC in the practice of enterprises. The study should lead to difficulties. This system is not widespread and does not have developed guidelines. This can lead to an incorrect distribution of processes and costs, a distortion of the calculation of the cost of production. Nevertheless, with a competent approach to using these parameters, you can get more accurate results.

1 Introduction

The formation of the management accounting system at the enterprise promotes a competent assessment of the current state, determines the development dynamics and helps to develop a set of measures to enhance the effectiveness of on-going activities, based on timely strategic decisions.

It is impossible to unequivocally state which of the existing methods of calculating and determining costs is the most accurate and optimal for use. When choosing a method of calculating cost, it is necessary to build on the fact that for making managerial decisions, reporting based on the marginal method of calculating cost is considered optimal.

2 Problem Statement

Konstantinov V. A. [1], Schaefer A.A. [2], Usatova L.V. [3] advocate the calculation of marginal revenue and cost, argue that the distribution of fixed costs incurred per unit of output is carried out on an absolutely arbitrary basis, therefore, such information cannot be used in making managerial decisions. The method of complete absorption of costs not only does not carry information useful for management personnel but is also partially misleading.

The opposite point of view is held by Sorokin V.V. [4], Bengardt M.V. [5]. Speaking on the side of the method of calculating production costs, the authors argue that no production is possible without constant production costs, which are overhead in relation to the main product, however, when calculating the cost, it is unacceptable to neglect them.

One of the most interesting areas in calculating the cost of production is the use of the ABC method. The method is based on cost accounting by function. The founder of this method are R. Cooper and R. Kaplan.

A distinctive feature of the method is the distribution of overhead costs not by type of manufactured products, but by actions performed during the production process, and this is what gave the name to the method – Activity Based Costing.

The traditional approach to costing in the accounting system boils down to the fact that fixed and variable costs should be included in the final product. Moreover, the inclusion of fixed costs is conditional.

The ABC method adheres to the point of view of the usefulness of information for decision-making by management, and, therefore, it has a more rigorous approach in terms of allocating overhead costs to the cost of the final product.

The cost object is a specific action, which has a specific function that is related to a specific type of activity. It is the ABC-Method that allows you to find a basis for the overhead costs distribution that is not related to production volume. The multivariance of the applied bases for the costs distribution makes this method more and more popular in the management accounting system.

However, in agricultural enterprises this type of accounting has not found wide application. This is because there are no general recommendations developed for the implementation of management accounting in the agricultural sector.

The problems of the formation of managerial accounting at the enterprises of the agricultural sector are studied in the scientific works of M. A. Vakhrushina [6], V.B. Ivashkevich [7], N.N. Karzayeva [8], E.I. Kostyukova [9–12], V.G. Shirobokov [13] and other scientists [14–18].

As already noted, organizations, including enterprises of the agricultural sector, in the process of activity are

* Corresponding author: pavlychenko_tn@mail.ru

faced with a large amount of overhead costs, which may be associated with:

- the movement of material values;
- ensuring the flow of resources into production;
- ensuring product quality;
- fulfillment of customer requirements, etc.

The distribution of indirect costs when using the ABC method is carried out according to the following scheme:

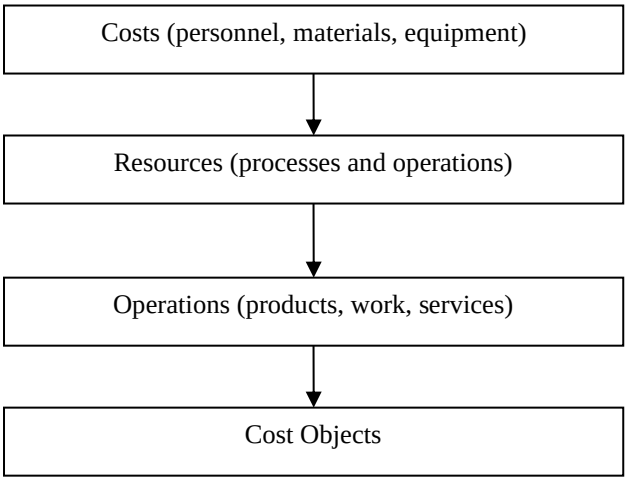

Fig. 1. Distribution of indirect costs using the ABC method

The ABC method allows you to avoid errors associated with the traditional distribution of indirect costs in proportion to the common base for all business entities (labor and working time, volume of products produced, value of revenue from sales). The use of more advanced technologies in production helps to reduce the share of direct costs while increasing the share of indirect costs. A single algorithm for allocating indirect costs to costs distorts the real picture, creating the effect of high profitability for those products that are not really such.

3 Research Questions

The subject of the work is the identified problems of calculating the cost of production in animal husbandry, and the possibility and feasibility of using functional-cost analysis in the animal husbandry industry are studied.

4 Purpose of the Study

Investigation of the possibility of the applying of cost accounting functional method in agricultural enterprises.

5 Research Methods

When studying the problems of using the ABC method, we used the methods of induction and deduction, functional-cost analysis.

6 Results

The calculation of the cost of production by the traditional method and the ABC method was made on the materials of OJSC “Yuzhnoye”, Rossoshansky district, Voronezh region. This company is a large-scale enterprise in of the Rossoshansky district, Voronezh region, specializing in milk production (table 1).

The table shows that the production area has not changed over the years. In 2017, the largest share in the structure of revenue for livestock products was occupied by dairy products – 47.94 %, and in crop production – corn – 24.09 %. In 2016 and 2015, this trend continued.

The main difference between the ABC method is the accumulation of production overheads not at sites (divisions), but at processes (operations), with subsequent distribution by types of products involved in these operations (Fig. 2).

Regardless of which method of calculating the cost is used, the main condition for obtaining reliable information is a clear definition of the composition of production costs. The division of costs into direct and indirect is due to the fact that part of the costs is directly related to the production of a certain object, while others relate to several production objects at the same time (cost accounting, costing) (Fig. 3).

The volume and nomenclature of direct and indirect costs depends on the specialization of production activities, the nature and diversity of products, the organizational structure of the enterprise.

The calculation of the cost of livestock production based on the traditional method is presented in table 2.

When calculated by the traditional method for the main dairy herd, the costs of by-products were excluded from all costs. The remaining costs are allocated in the ratio of 90 and 10 % for milk and offspring, respectively. Thus, in OJSC “Yuzhnoye”, Rossoshansky district, Voronezh region, the cost of 1 centner of milk in 2017 amounted to 1785.16 rubles, the cost of 1 offspring is 15283.37 rubles. The cost of 1 c. live weight of 15,356.24 rubles.

The use of the ABC-Method in OJSC “Yuzhnoye” involves the use of a cost driver for each production process. Processes not directly related to production volumes include equipment operating costs, product delivery to storage locations, vehicle repair, equipment depreciation, and product quality control.

Firstly, activities that increase the value added of products are identified. For example, in the analyzed commercial organization OJSC “Yuzhnoye”, which specializes in the production of livestock products, the following activities are allocated that consume the appropriate resources: labor of production workers, purchase of feed and materials, installation and repair of equipment, collection of products, quality control of products.

Secondly, cost o for each type of activity are determined by content and quantity. The most difficult and crucial moment is the decomposition of complex operations into performed actions, which makes it

possible to use various cost objects for the components of the performed action. Manyaeva V.A. [19] determines the cost objects: the number of material resources supplies, the number of product quality checks, the number of equipment adjustments, etc.

Based on the recommendations of the author on the allocation of cost objects, we will formulate a list of actions taken for the livestock industry by comparing them with cost elements.

Table 1. Revenue structure for products sold

Products the industry	2015		2016		2017	
	thousand roubles.	% to total	thousand roubles.	% to total	thousand roubles.	% to total
	34045	25.3	45120	27.9	38754	24.1
Corn	3323	2.5	25032	15.5	7268	4.5
Sunflower	-	-	332	0.2	8325	5.2
Soybean	-	-	247	0.2	589	0.4
Another crop production	37368	27.8	70731	43.9	54936	34.2
Total crop production:	66260	49.2	68582	42.6	77139	47.9
Milk	30848	22.9	18497	11.5	22037	13.7
Live weight of cattle	39	0.03	35	0.02	0	0
Live weight of horses	39	0.03	31	0.02	0	0
Recycled livestock products	97186	72.2	87145	54.1	99176	61.6
Total livestock:	-	-	3311	2.1	6772	4.2
Other	134554	100	161187	100	160884	100

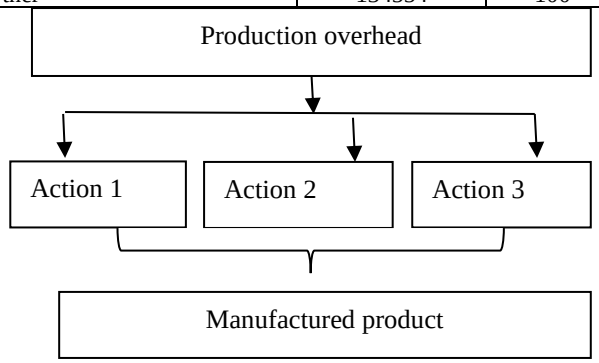

Fig. 2. Costing – ABC Method

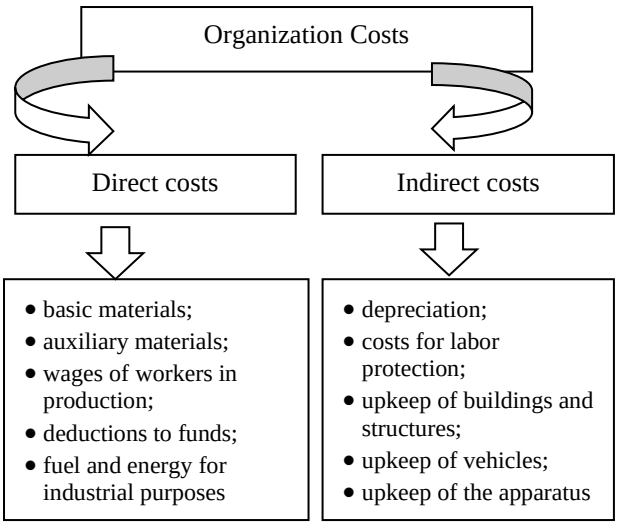

Fig. 3. Cost sharing

Table 2. Calculation of the total production cost of livestock products by the traditional method in 2017

Indicators	Milk	Live weight gain	Total
Direct material costs, thousand rubles	27862	15025	42887
Labor costs, thousand rubles	16586	6816	23402
Production overhead, thousand rubles	14289	7428	21717
Total costs, thousand rubles	65263	29269	94532
The cost of 1 c. live weight, rubles	–	15356.24	–
The cost of 1 c. milk, rub.	1785.16	–	–
Cost of 1 goal. offspring, rub	15283.37	–	–
Livestock Goal	427	–	–
Volume of production, c	32903	1906	–

Table 3. Correlation of cost items and their objects in livestock

Expenditures	Cost object
Stern	Delivery to the farm; distribution to animals
Remuneration of labor	Cleaning; padding; distribution of food; veterinary examinations
Animal Remedies	The number of vaccinations; veterinary examination
The content of fixed assets	Depreciation; equipment setup; equipment debugging; maintaining equipment in working condition
Work and Services	Transportation; ventilation
Organization of production and management	Recounting animals; product quality control
Losses from the death of animals	Expertise; disposal
Other expenses	Rent; specialist consultations; insurance

The built-in driver system allows you to determine the causes of overhead costs, their cost estimation, as well as establish the moments for making management decisions. Drivers, in the role of cost objects, increase the level of validity of managerial decisions made, since they provide answers immediately to several questions: what resources were used in production and what works accompanied this process.

Thirdly, cost pools are formed by types of activities, which, for the purpose of analysis and planning, are divided into cost components by the type of resources expended (raw materials, labor, costs of maintaining and operating machinery and equipment, etc.).

At the fourth stage, the cost object rate for each type of activity is calculated by the ratio of its amount to the value of this object. The division of cost pools into homogeneous components by type of activity becomes the basis for calculating the rate for each cost component.

Table 4. Grouping Costs by Cost Object

Process Cost Accumulators	Cost driver	The cost of the process, rub	Number of operations		
			milk	Live weight gain	total
Depreciation of equipment	OS Usage Number	6986917	240	149	389
Transportation	Number of parties	3189000	67	45	112
Delivery of materials to the farm	Number of deliveries	2111245	98	14	112
Hardware debugging	The number of changes, units	8184200	225	53	278
Product quality control	Number of control operations	1245784	30	5	35
Total expenses		21717146			

Table 5. Calculating driver rates by process

Process Cost Accumulator	Total costs of the process, thousand rubles	The number of parameters for each type	Driver rate, thousand rubles
Depreciation of equipment	6986.92	389	17.96
Transportation	3189	112	28.47
Delivery of materials to the farm	2111.25	112	18.85
Hardware debugging	8184.2	278	29.44
Product quality control	1245.78	35	35.59

At the fifth stage, the costs of production management are distributed per unit type of product, with a pre-determined number of cost objects for each unit of this type of product.

At the final stage, a calculation matrix is compiled for the production cost of a unit of production, formed by the ABC method. For each type of product, costs are calculated as the product of the driver rate for each attribute by the number of manifestations of this attribute per unit of output (Table 6).

According to the results of calculations from tables 2 and 6, the cost value calculated by the traditional method differs from the cost value determined by the ABC method. This indicates that with a change in the methodology for calculating the cost of production of the main dairy herd, it became possible to determine the overhead to produce each type of product, which is difficult to obtain using any other method. Knowing the amount of overhead costs for each of the processes, you can both manage them and find out the reason for the cost overrun.

Table 6. Calculation of the cost of livestock production by ABC method

Expenditures	Milk	Live weight gain	Total
Direct costs of materials, thousand rubles	27862.24	15025.19	42887.43
Labor costs, thousand rubles	16586.46	6816.12	23402.58
Production overhead, thousand rubles			
Depreciation of equipment	4310.69	2676.22	6986.92
Transportation	1907.71	1281.30	3189.00
Delivery of materials to the farm	1847.34	263.91	2111.25
Hardware debugging	6623.90	1560.30	8184.20
Product quality control	1067.82	177.97	1245.78
Total cost	60980.26	27026.90	88007.16
The cost of rub/c	1829.81	14586.04	x

7 Conclusion

A competent approach to conducting preparatory measures for the implementation of a new model for calculating costs will allow you to get a large amount of information for making managerial decisions and solving problems of quality management, continuous improvement of production and marketing, business processes, and also makes it possible to manage overhead costs.

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