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THE COST FORMATION MECHANISM OF MILK AND ANIMAL YIELD IN DAIRY CATTLE-BREEDING IN CONDITIONS OF COSTS GROUPING BY PHYSIOLOGICAL CLASSIFICATION

Guzaliya Salikhovna Klychova, Albert Tagirovich Iskhakov

Kazan State Agrarian University

Abstract: This article scrutinizes the cost formation mechanism of milk and animal yield in dairy cattle-breeding in costs grouping conditions by physiological classification, it's analysis allows to reveal "weak points" in production process of the enterprise and to direct point efforts to overcome negative consequences, and also enables to optimize and more exact prognosis of the company's financial results.

Key words: cost of milk and animal yield, physiological group, dairy cattle-breeding, management accounting, distribution coefficient of factor cost.

The dairy cattle-breeding represents one of the branches of the animal industries, specializing on cultivation of cattle for the purposes of reception, storage, processing and sale of milk. Each of the listed processes, by-turn, should be carried out in conditions of clear delivered accounting and also in the presence of the developed normalization and control mechanisms.

The sort or group of animals (herd of dairy cows) is the calculation object at the enterprises of dairy cattle-breeding. According to methodical instructions no.792, paragraph 65.1 of the Ministry of Agriculture of the Russian Federation there is proportion which allows to distribute herd of dairy cows' costs between two basic kinds of production in dairy cattle-breeding – milk and animal yield – in concordance with exchange energy of forage. 90% of herd of dairy cows' costs concerns milk (except collateral production – manure, a wool-moult and hair-raw) and 10% of herd of dairy cows' costs concerns animal yield. After defining the actual costs which concerns milk and animal yield, accountants divide these costs into quantity of calculation units, in agriculture milk is traditionally measured in centners, and animal yield in heads. Thereby we can find the actual cost of centner of milk and one head of animal yield. We have made an example of similar calculations in table 1.

Table 1. The calculation of actual cost of milk and animal yield dairy cattle-breeding

The objects of calculation	Actual expenses, thousand roubles	Distribution proportion of costs,%	Distributed actual costs, thousand roubles	Calculation units	Actual cost of the unit, roubles
Milk	1746,76	90%	1572,08	1723 centners	9,12
Animal yield		10%	174,68	47 heads	3716,59
Total	1746,76	100%	1746,76	x	x

By the results of made calculations it is possible to draw a conclusion, that as a whole, according to year results the actual cost of centner of milk made up 9,12 roubles, and the cost of the head of animal yield made 3716,59 roubles. The given above cost calculation method of one centner of milk and one head of animal yield provides that keeping of herd of dairy cows is carried out in the mixed form, i.e. from the point of view of production process cows' feeding occurs without taking into account of physiological condition of the cow after calving. At the same time cattle breeders has been noticed, that cows during the different periods after dry period give milk and consume forage with a different degree of intensity. All this has led to the fact that in dairy cattle-breeding a technology of keeping cows by physiological groups has appeared which is unlike the mixed keeping allows to individualize diet of dairy cows, to optimize quality and volume of received milk.

The essence of keeping the cows on physiological groups consists of that herd of dairy cows divide into three criteria: number of days after calving (D), daily milk productivity (P) and fatness of the cow on a five-point scale (F). The example of criteria division of herds of dairy cows, withdrawn from recommendations of the Federal government of "the Main computer center of the Ministry of Agriculture of Russia".

Table 2. Criteria «D», «P», «F» to divide herd of dairy cows into groups

Number of group	Number of days after calving (D)	Daily milk productivity (P) on one head, kg	Fatness (F), points
1	0–100	More than 24	3,5–2,5
2	101–200	24–16	2,5–3,0
3	201–305	16–8	3,0–3,75
4	306–345	–	3,0–3,75
5	346–365	–	3,0–3,75

The given values for a daily yield of milk (Y) are proceeding from value of annual efficiency of the cow of 6000 kg. Let us give the characteristic to the given groups:

- 1) On the first group of cows the actions are directed to increase milk yield, this group is characterized by the greater yield of milk among other groups (more than 24 kg per day on the cow). Cows enter this group on the 6th day in the weakened state after calving. High productivity of this group inevitably conducts to dairy cows' weight loss, and even correctly chosen diet in the necessary volume cannot compensate loss of energy. Therefore the basic purpose of the cows keeping in the first physiological group (besides reception of milk) is the thorough cows nursing;
- 2) the second group is characterized by a smaller yield of milk (24–16 kg per day on the cow). During this period cows start to gain weight as milk yield decrease conducts to decrease of energy. The basic purpose of this group is to debar the decrease of daily yield of milk on more than 9% per month;
- 3) the third group is characterized by the least yield of milk (less than 16 kg of milk per day on the cow). The group is similar with the second group, the basic purpose here is to debar a yield of milk on more than 9% per month. In this group there is a preventive maintenance of mastitis, the further cows' weight gaining, preparation of cow to calving;
- 4) the fourth group involves dry cows. The dry period in average lasts for 60 days, nearby 40 of which is due to this group. The purpose of cows keeping in this group is to debar excessive growth of cow's fetus that is caused by excessive fatness and it is fraught with difficult calving with subsequent complications. The diet of the cow in this group should be balanced by microelements, in particular by magnesium and contain a minimum quantity of the concentrated food;
- 5) the fifth group is puerperal. Cows are there approximately for 20 days up to calving and 5 days after for feeding the animal yield with colostrum. Before 20 days prior to calving the cow is transferred on a diet of the first group. The volume of the combined forage gradually increase up to 3–4 kg per day. The purpose of cows maintenance in this group is occurrence of animal yield without the additional help from the outside.

From the point of view of milk reception technology in comparison with the mixed maintenance cows' keeping by physiological groups promotes the increase of efficiency, the improvement of cows' health state, birth of more healthy animal yield, economy of the concentrated food during the dry period, etc. From the point of view of the financial and management account the maintenance of cows on physiological groups should provide the account of expenses conducting the cost calculation on each physiological group separately, thus in first three groups the basic object of calculation will be the centner of received milk, and in the 4th and 5th group – animal yield. The different conditions of

the maintenance of cows in groups, in particular, a different diet of forages is the most expensive article of expenses for the enterprises of dairy animal industries which assume reception of the different cost of centner of milk in groups. Overhead expenses also should be distributed among the physiological groups, or passing this stage – between final objects of calculation. Thus, in our opinion, the technology of costs calculation of production of herds of dairy cows should not lag behind from described above technology of the separate cows' keeping.

For the purposes of milk and animal yield costs calculation by physiological groups it is necessary to develop:

- 1) the list of factor cost against physiological groups;
- 2) the distribution mechanism of factor cost to physiological groups between milk and animal yield of every group. We offer the following distribution coefficient (*table 3*).

Table 3. The distribution coefficient of factor cost between milk and animal yield according to physiological groups

Objects of calculation	Physiological groups				
	I	II	III	IV	V
Milk	0,96	0,9	0,9	0	0
Animal yield	0,04	0,1	0,1	1	1

As cows are transferred into the first physiological group after the sixth day of calving, on the 65th day after calving they inseminate, and for the 100th day are transferred into the second group, in our opinion it is necessary to consider the time factor and to use a proportion not 90% to 10%, but 96% to 4%, i.e. the costs for animal yield are reduced at the given stage more, than twice. The time factor is also assumed, that the traditional proportion 90% to 10% should be used in the second and third physiological group, where the cows are already inseminated. Thereby the metabolizable energy of forages at a rate of 10% is consumed by animal yield from the first and up to the last day of being in these groups. The cows who are in the fourth and fifth groups are dry cows and it becomes that forage consumed by cows completely spend on formation of animal yield, i.e. 100% of factor cost covers the animal yield;

- 3) to establish the mechanism of indirect cost distribution. As a whole it is possible to mention, that in the presence of several subdivisions which maintain costs account by physiological groups, there comes an opportunity of each subdivision's simultaneous using the methodology of indirect costs' full distribution and, accordingly, finding the full cost of calculation objects within the group, and methodology based on partial distribution of indirect costs with finding incomplete cost of milk and animal yield. Here is necessary to mention the opportunity of complete or partial reference of indirect costs only to the dairy physiological groups because sales of milk realizes for the short period of time. If refer indirect

costs to animal yield they will pay back only during process of amortization charge when after fattening the young animal will be transferred into the composition of fixed assets, i.e. after long time interval;

- 4) develop new and to modify old basic documents, account registers, distributive and cost sheets. Basic documents modification means the introduction of additional meaning "physiological group" to the established forms which will make possible to detail and group costs in the necessary view. The account registers also should be modified or entered additionally so that the information about cows' keeping factor cost could be collected in them. At the enterprises of dairy cattle-breeding the distributive and cost sheets depending on accepted calculation objects should promote the distribution of indirect costs between milk and animal yield, physiological groups of animals, and between responsibility accounting of the whole enterprise, and besides to form the information about the cost of calculation objects.

The planning in conditions of costs refinement by physiological groups and revealing of deviations of actual received performance from planned performance will differ from costs planning in conditions of the mixed cows' keeping. First of all, it is caused by presence of greater number of calculation objects, everyone of which is characterized by the quantity of milk yield and cows' keeping costs. It is necessary to mention here, that for the purposes of animal yield cost calculation the information about 4 and 5 groups' costs will be used as well as in first three groups, therewith the costs undertake in proportion mentioned in table 3, i.e. regarding on reception of animal yield instead of milk.

It is necessary to note, that calculating the cost of milk and the received animal yield besides factor cost on cows' keeping by physiological groups, the calculation also includes the distributed indirect costs of the enterprise. As a result accountants of the enterprise receive the information about the cost of milk and animal yield reception of every physiological group, and not only within the concrete herds of dairy cow, but also at the enterprise as a whole. In the latter case cows' keeping costs performance of concrete physiological group are summing up by the whole enterprise. In whole at the enterprise planned quantity of production

made in the same group (milk and animal yield) is also calculated. Dividing first performance by the second we find general for the organization cost of milk or animal yield by physiological group. The received performance of the cost can be used for the estimation of subdivisions' work efficiency, the individual planning considering work characteristic of responsibility accounting, in application of flexible mechanisms of pricing in different geographical segments of business, etc.

The application of the offered system of calculation increases labour-intensiveness in planning, calculation, revealing and interpretation of deviations. Leadership should retrain accountants, implement computer system of data processing, adjust within the first year the methodology of the costs account and calculation, the automated system of data processing, to invite experts, etc. At the same time the offered system of costs account and calculation allows to reveal "weak places" in production process at the enterprise and to direct point efforts to overcome negative consequences. The knowledge of the costs demanded from cows' keeping in physiological groups, enables to optimize and gives more exact prognosis of the company's financial results. Finally, making a decision of introduction it is necessary to follow principle "expenses – benefits".

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- Klychova Guzaliya Salikhovna** – Doctor of Economics, professor, head the department of accounting and audit
Kazan State Agrarian University e-mail: kgsaudit@rambler.ru
Iskhakov Albert Tagirovich – the postgraduate of accounting and audit department
Kazan State Agrarian University e-mail: iat21@mail.ru

