

UPDATING OF METHODS OF CALCULATIONS OF COSTS IN BREEDING OF SMALL RUMINANTS

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The study deals with the methods of calculation of costs in breeding of small ruminants. The change when sheep wool is proposed to be included in side products is significant in subtraction method. Costs of main products in the foundation herd of sheep and goats are planned out by the method of equivalent numbers. The novelty is that equivalents are based on objective need of milk documented by research studies of Slovak and foreign authors. 5.1 l of sheep milk are needed for production of 1 kg of live weight in lambs to weaning, in kids 7 l of goat milk. In production of 1 kg of sheep lump cheese 4.5 l of sheep milk are needed. Goat milk is usually sold after basic treatment in native conditions. Raised working demands in milk obtaining by milking of sheep and goats or in production of sheep lump cheese, resp. are considered by coefficient for consumed milk 1.05 in production of sheep lump cheese or 1.15 in milked goat milk. Updated knowledge is recommended to be used in methodology for practice.

breeding of sheep and goats; methods of calculation of costs

INTRODUCTION

Changes in economic system require permanent updating of methods of calculations of costs. The solution of matter in hand in breeding of small ruminants wants to contribute to this.

Methodological procedures accepted till 1989 in finding the costs of different agricultural products allowed lower objectivity. Since 1990 in many agricultural enterprises the refrained from recording of costs of products and costs of the branch were finding. In forming competitive environment it is necessary that a farmer should be prepared for market also from economic aspect. One of the basic prerequisites which will allow to assess real grounds of the level of market prices of sheep and goat products is to know the costs of their production. This information is interesting also for decision sphere in connection to the subsidy policy.

Within the method of calculation of costs in agricultural production the issues in sheep breeding were solved by Lom (1971), Fabritschnov (1981) and Novák (1996). Sedlák (1972), Vláčil (1993) and Moise (1975) were dealing with methodological problems of finding the costs, particularly in sheep breeding. In relationship to the problems of calculation the knowledge from nutrition of sheep and goats are valuable (Economides, 1986; Ochodnický, 1993), from sheep milk production (Švec, 1977) and utility orientation (Hetényi et al., 1995).

When compared the sheep breeding, the problems of calculation of costs for different products in goat breeding worked out to a significantly smaller extent. In relationship to the solved problems some of economy-oriented studies are presented here (Senková, 1995; Vláčil, 1989).

MATERIAL AND METHODS

In updating of methods of calculation of costs in breeding of small ruminants the knowledge from Slovak and foreign literature, authors' knowledge and knowledge of present conditions in practice will be used.

In solving the calculation of costs subtraction method and method of equivalent numbers will be used. Calculation groups for sheep and goats, main and side products as well as equivalent numbers will be proposed. The proposed solution of calculation of costs of main products in the foundation herd of sheep and goat breeding will be applied on an example of selected business entities (1995, 1996). In farms with sheep breeding with average number of ewes 2 127–23 087 kg of lambs to weaning and 32 192 kg of sheep lump cheese were produced. Costs of these main products represented in total 6 986 thous. Sk. In an enterprise with goat breeding from 81 goats 1 373 kg of kids to weaning were bred and 25 554 l of goat milk were milked. Costs of the above products were 841 thous. Sk.

RESULTS AND DISCUSSION

The basic prerequisites for conducting annual resulting calculations in breedings of small ruminants include security of consistent operative, accounting and statistical record keeping. Besides value expression, the records in natural units should be kept what will increase predicability of calculation. It is necessary to include only essential costs for organizing of breeding.

In sheep and goat breeding the division into calculation groups, main and side products (Tab. I) is proposed. For purposes of calculation of costs into the foundation herd of sheep, ewes, lambs to weaning and breeding rams are

I. Calculation groups in breedings of small ruminants

| Type of animals | Calculation group | Main products | Calculation unit | Side products |
|-----------------|-------------------|-----------------------------------|------------------|--------------------------------|
| Sheep | basic herd | weaned lambs sheep lump cheese | 1 kg 1 kg | sheep raw wool sheep manure |
| | young sheep | growth gain | 100 feeding days | sheep manure |
| Goats | basic herd | weaned kids goat milk | 1 kg 1 kg | goat manure |
| | young goats | growth gain | 100 feeding days | goat manure |

included. The group of young sheep consists of particularly reproduction ewe-lambs, ram lambs or other lambs which were not sold as dairy lambs in pre-Easter or during Christmas period. In goat breeding the foundation herd analogously includes the adult goats (breeding goats), kids to weaning and breeding billy-goats, the group of young goats consists of reproduction material or other unsold kids.

For purposes of calculation the special study of costs (especially feed consumption, labour costs, etc.) of the foundation herd and young animals is needed. If not provided what is usual in practice, e.g. in low concentrations, there is a certain way out in quantification of costs. The costs may be divided into calculation groups using feeding days whose value should be corrected in young animals by certain coefficient with respect to lower cost rate. This way of calculation decreases objectivity of costs, it cannot substitute special record keeping and it may be used only in extreme case.

In breeding of small ruminants it is the case of production of associated products, Tab. I proposes the distribution into main and side products. In some sheep breedings sheep milk in native condition which is included in main products can be sold.

In calculation of costs of products from sheep and goat breeding, it is recommended even now to use the subtraction method and the method equivalent numbers. For example, in sheep breeding production of raw wool and sheep manure is deducted from the costs in prices within the enterprise. The remaining sum represents the costs of main products of the foundation herd. These costs are recommended to be divided into lambs to weaning and sheep lump cheese using the method of equivalent numbers. The production of both the products are converted in natural expression into common denominator – milk. Equivalent numbers are based on average need of sheep milk 5.1 l for production of 1 kg of live weight of lambs to weaning and 4.5 l

of milk for production of 1 kg of sheep lump cheese. In cheese production higher labour demandingness is considered what is expressed by coefficient 1.05.

Costs of main products are divided by the volume of calculated milk obtained by multiplication of actual amounts of products by the given equivalent numbers. After finding the costs of 1 kg of calculated milk, the volume of costs falling to lambs to weaning and particularly sheep lump cheese is quantified. By the division of actually produced amounts, unit costs per 1 kg of lambs to weaning or 1 kg of sheep lump cheese, resp., are obtained.

In goat breeding equivalent numbers based on the need of goat milk 7 l for production of 1 kg of live weight of kids to weaning are recommended. Besides this raised costs of milked goat milk are considered by the coefficient 1.15.

For better understanding the application of methodological procedure of calculation of costs of main products in the foundation herd of sheep and goat breeding is presented in Tab. II. It is based on the data given in the methodology which are calculated for one breeding ewe with an aim to give the picture of the efficiency. In selected enterprises in calculation for 1 average ewe 10.9 kg lambs to weaning and 15.1 kg of sheep lump cheese were produced annually. In goat breeding in calculation 17 kg of kids to weaning and 316 l of milked goat milk fell to 1 goat-dam.

Negative aspect of the given proposal of calculation of costs of different products of small ruminants is the use of the method of equivalent numbers.

II. Calculation of costs of main products in the foundation herd of sheep and goats

| Production of main products | | Equivalent numbers | Calculated amount of milk (kg) | Costs of calculated amount of milk (thous. Sk) | Costs per unit of main product (Sk/kg) |
|--|--------|--------------------|--------------------------------|--|--|
| Name | amount | | | | |
| Lambs to weaning | 23 087 | 5.1 | 117 744 | 3 048 | 132.02 |
| Sheep lump cheese | 32 192 | 4.5 (1.05) | 152 108 | 3 938 | 122.33 |
| Main products in total from sheep breeding | x | x | 269 852 | 6 986 | x |
| Kids to weaning | 1 373 | 7.0 | 9 611 | 207 | 150.77 |
| Goat milk | 25 554 | 7.0 (1.05) | 29 387 | 634 | 24.81 |
| Main products in total from goat breeding | x | x | 38 998 | 841 | x |

It is taken into account that the selection of suitability of equivalent, its dimensions, affect significantly objectivity of results of calculations.

The proposal of calculation brings also positive aspects which we want to emphasize. In congruency with restructuring of production orientation of breeding division of sheep and goat products into main and side ones are updated in the sense of application of subtraction method. The formation of equivalents lies with the scientifically based normative basis. Results of calculation give the possibility of orientation on the level of cost demandingness of different sheep and goat products. The method of calculation of costs is relatively simple, it does not make demands for extension of record keeping compared with the common necessities and therefore it is suitable to be used in practice.

The proposed procedures in application of methods of calculation of costs in breeding of small ruminants are comparable with the methodological solution of many authors (Lom, 1991; Sedlák, 1972; Moise, 1975; Vláčil, 1993; Novák, 1996). In using subtraction method sheep manure is included in side products.

The methodology of findings the costs issued by the Ministry of Agriculture and Nutrition of the Slovak Republic and valid until 1989 side products included besides sheep manure also sheep lump cheese. It was not correct as the share of the cheese in sales income from sheep breeding oscillated around 30%. The common denominator of the production was the wool to which lambs were calculated by differentiated equivalents according to breeds which were not correctly determined from the material aspect.

Sedlák (1972) included in main products also sheep lump cheese. Equivalent numbers by which costs of lambs to weaning, cheese and wool were calculated, including keeping the life functions, were based by him on the need of digestible crude protein and labour. Equivalent numbers were differentiated according to the breeds, age of weaned lambs and on the level of cheese production. This methodology was used in enterprises of a selected set with some modifications.

Of foreign authors, Fabritschnov (1981) presents the division of costs: 50% for wool and 50% for meat. Moise (1975) draws attention towards the efforts to consider the wool as the main product, he does not consider it as a satisfactory solution and recommends to study this problem in research.

After 1989 in sheep breeding no more is valid that a main utility orientation is the wool production. This had an impact on classification of products in application of subtraction method in calculation of costs. In our opinion the side (secondary) products should include except sheep manure also sheep wool. Transformation in value hierarchy of sheep products in post-November

period showed that the wool forms only a supplementary source of sales income from sheep breeding (6–8%) and neither in the future period a more significant change is expected.

Within the process of restructuring of agricultural production in sheep breeding an orientation to meat and milk efficiency has been accepted and it is also calculated in the future (Hetényi et al., 1995). Under existing prices of sheep products, a decisive share in formation of the profit and hence also the position in the market will belong to slaughter animals and milk. With respect to this fact, the category of main products of the foundation herd of small ruminants will include young animals to weaning and lump cheese.

A source for determination of equivalent numbers was the knowledge of several authors on normative necessity of milk for production of young animals to weaning or for cheese production, respectively. Economides (1982) reports that 1 kg of lamb weight gain can be expected from 5 l of taken sheep milk, in kid from 7 l of goat milk. Sedlák (1972) presents that in the dairy breed Awassi (Israel) with inconsiderable wool production, meat is calculated for milk in ratio 1 : 5. Ochodnický (1993) found that per 1 kg of weight gain of lamb to weaning the consumption was 5.11 l of mother milk. Švec (1977) was dealing with the changes in the amount of sheep milk and its composition during milking season. 4.5 l of sheep milk is consumed on average for production of 1 kg of lump cheese in sheep.

The proposed methodological solution allows to calculate the costs of products from sheep and goat breeding by undemanding way, it does not make raised demands for special record keeping in an enterprise, therefore it is suitable for current use in practice. In the interest of increase of objectivity of the results of calculation, it is necessary in the future to remove imperfections and to improve methods of calculation of costs.

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Received for publication on December 15, 1997

VLÁČIL, R. (Výskumný ústav živočíšnej výroby, Stanica chovu a šľachtienia oviec a kôz, Trenčín, Slovenská republika):

Aktualizácia metód kalkulácie nákladov v chove malých prežúvavcov.

Scientia Agric. Bohem., 28, 1997 (4): 301–308.

Pri kalkulácii nákladov na výroby využívame zostatkovú (subtraktívnu) metódu a metódu ekvivalentných čísiel. Pri subtraktívnej metóde navrhujeme v chove oviec zmenu, keď do vedľajších výrobkov začleníme popri ovčom hnoji i ovčiu vlnu, ktorá v súčasnosti tvorí len 6–8 % z tržieb. Hlavné výrobky v základnom stáde oviec sú jahňatá do odstava a ovčí hrudkový syr. Náklady na hlavné výrobky sa rozpočítajú pomocou ekvivalentných čísiel. Ekvivalenty sa tvoria podľa objektívnej potreby mlieka (ide o nový prístup k riešeniu, ktorý môže nájsť širšie uplatnenie v praxi). Na 1 kg živej hmotnosti jahniat do odstava je treba 5,1 l ovčieho mlieka. Na výrobu 1 kg ovčieho hrudkového syra je priemerná potreba 4,5 l ovčieho mlieka. Vyššia pracovná náročnosť sa zohľadní koeficientom 1,05.

V základnom stáde kôz sú hlavné výrobky kozľatá do odstava a kozie mlieko. Na 1 kg živej hmotnosti kozliat do odstava sa spotrebuje 7 l kozieho mlieka. Vyššia pracovná náročnosť na vydojené mlieko (pre trhové účely) sa vyjadří koeficientom 1,15.

SCIENTIA AGRICULTURAE BOHEMICA, 28, 1997 (4): 301–308

Vo vybraných podnikoch, v ktorých aplikujeme metodiku kalkulácie nákladov, sa v chove oviec vyrobí 10,9 kg jahniat do odstavu a 15,1 kg ovčieho hrudkového syra v priemere na jednu bahnicu a rok. V chove kôz pripadá na jednu kozu-matku 17 kg kozliat do odstavu a 316 l vydojeného kozieho mlieka. Vypočítané náklady na hlavné výrobky z chovu oviec a kôz uvádzame v tab. II.

Pre pomernú jednoduchosť metodiky kalkulácie, primeranú požiadavku na evidenciu, ju možno využiť v praxi.

chov oviec a kôz; metódy kalkulácie nákladov

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