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Gabiña D. (ed.), Bodin L. (ed.).
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Zaragoza : CIHEAM

Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 33

1997

pages 105-108

Article available on line / Article disponible en ligne à l'adresse :

<http://om.ciheam.org/article.php?IDPDF=97605996>

To cite this article / Pour citer cet article

Dimov D., Angelov J. **Information system for lactation calculation and data collection in dairy sheep.** In : Gabiña D. (ed.), Bodin L. (ed.). *Data collection and definition of objectives in sheep and goat breeding programmes: New prospects* . Zaragoza : CIHEAM, 1997. p. 105-108 (Options Méditerranéennes : Série A. Séminaires Méditerranéens; n. 33)



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Information system for lactation calculation and data collection in dairy sheep

D. DIMOV
J. ANGELOV
UNIVERSITY OF AGRICULTURE
DEPARTMENT OF ANIMAL HUSBANDRY
PLOVDIV 4000
BULGARIA

SUMMARY - In the light of new realities in sheep breeding in Bulgaria, developments of new breeding programmes for many local breeds are necessary. The production system is described and perspective sheep breeds are indicated. Milk yield and prolificacy appear to be traits with greater economic importance in local breeds - Pleven black head, Stara Zagora, Maritza and some dairy crosses with East Friesian and Awassi breeds. An information system for lactation calculation and data collection of dairy ewes is described. This information system was designed for monitoring the local dairy sheep. Representative data on milk yield and prolificacy have been provided according to the international regulations and standards.

Key words: Milk recording, lactation calculation, data collection.

RESUME - "Système d'information pour le calcul de lactations et la collecte de données en ovins laitiers". A la lumière des nouvelles réalités de l'amélioration génétique des ovins en Bulgarie, il est nécessaire de mettre au point de nouveaux programmes d'amélioration génétique pour de nombreuses races locales. Cet article présente le système de production ainsi que les perspectives des races locales. Le rendement laitier et la prolificité semblent être des caractères de la plus grande importance économique chez les races locales - Pleven à tête noire, Stara Zagora, Maritza et quelques croisements laitiers avec les races Frisonne de l'Est et Awassi. On présente un système d'information pour le calcul de lactations et la collecte de données chez les brebis laitières. Ce système d'information a été mis au point pour le suivi des races laitières locales. On a ainsi apporté des données représentatives du rendement laitier et de la prolificité selon les règles et standards internationaux.

Mots-clés : Contrôle laitier, calcul de la lactation, collecte de données.

Introduction

After 1990, great changes took place in Bulgarian sheep breeding. The number of sheep population decreased from 8,609 million (1989) to 3,397 million (1995). Selection and genealogical structure of the existing sheep breeds were also changed. Lots of the newly created Merino breeds have been liquidated during the liquidation of the large co-operative farms (1000-3000 ewes per farm). At present, 92% of the sheep population are in the private sector in small herds (40-60 ewes per farm). Private farmers give preference to some local breeds like Pleven black head, Stara Zagora, Maritza and some dairy crosses with East Friesian and Awassi breeds. Till recently, private farmers have not been organized in systematically breeding work or regular recording of performances.

Therefore new breeding strategies development and involving the private farmers in selection process are necessary, including perspective Bulgarian breeds.

Selection objectives and selection criteria

To develop a new breeding programme, it is essential to know the production system and the economical effect of productive traits of the breeds. Developing new breeding programmes requires

good knowledge of the production system, and of the economic importance of productive traits of the breeds.

Most of the local Bulgarian sheep breeds have a good milk production. Our studies in the private sector in Plovdiv region for the period 1994-1996 show that milk yield of the local breed - Splotch Faced Maritza (150 litres per milking period; prolificacy -1.5, weight of wool - 2.8 kg) provides 60% of income of the herd. About 38% of the income come from the number of the lambs sold in the market and only 2% come from the wool. This is approximately the same as the other local breeds - Pleven black head and Stara Zagora.

Milk yield and prolificacy appear to be traits of greatest economic importance and describe selection objective directly.

Milking of the ewes is a very old practice in Bulgaria. Milk recording exists for many years. Such practice is typical for the large co-operative farms, where there were fairly good conditions for milk recording. Now, most of these farms do not exist. This situation requires new methods of milk recording and data collection of many local breeds grown on private farms.

Production system in Bulgaria nowadays (private sector): (i) small size of the herds (20-40-60 ewes) in different villages; (ii) natural mating system - long-lasting lambing period (from December to March); (iii) milking period from the beginning of March to the end of August; (iv) usually three milking per day; (v) revailing hand-milking; (vi) average suckling period 50-60 days; (vii) average milking period 150-180 days.

Milk recording type

In the beginning of 1993 milk recording programme of local Maritza sheep was started with the support of private farmers from Plovdiv region and the National fund of scientific research. There are two types of local Maritza sheep - White and Splotch-Faced. They breed like two separate breeds.

AC method is accepted as the best method suitable for International regulation of milk recording in sheep (Barillet *et al.*, 1992) and specific production system in Bulgaria nowadays. Only one of the three daily milkings is recorded, taking into account the total volume of milk produced by the whole flock. It is planned for 5 or 6 test days during the milking period (150-180 days milking period). Interval between two successive test days - 30 ± 3 days. Average suckling period - 60 days is fixed as a standard. Only the milked yield during the milking period is taken into account (without that suckled from the lambs).

Regarding the calculation of milked yield, the Fleischmann method was adapted. There is no difference in the results of calculated milked yield between Fleischmann method and our adaptation. This adaptation is needed for overcoming some difficulties caused by long lambing period and some differences between flocks (Dimov *et al.*, 1996).

The selection in dairy sheep set up on data of milk yield for standardized milking period. While establishment of some traits like prolificacy, body weight, weight of fleece require a single time recording, the establishment of the milk yield in sheep require repeated measurement during milking period and labour-consuming work. Although, these are routine calculations, taking too much time to obtain performances of milk production.

The aim of this paper is to present an information system of lactation calculation and data collection in dairy sheep designed for specific extensive production system in Bulgarian sheepherding now.

Information system - LICO

LICO is an information system realized in WINDOWS 3.1 through some programs of Microsoft Office - MS Excel 5.0, Visual Basic for Excel 5.0, MS Access 2.0. There are two subsystems: Li_1.0 and RECOD (Fig. 1).

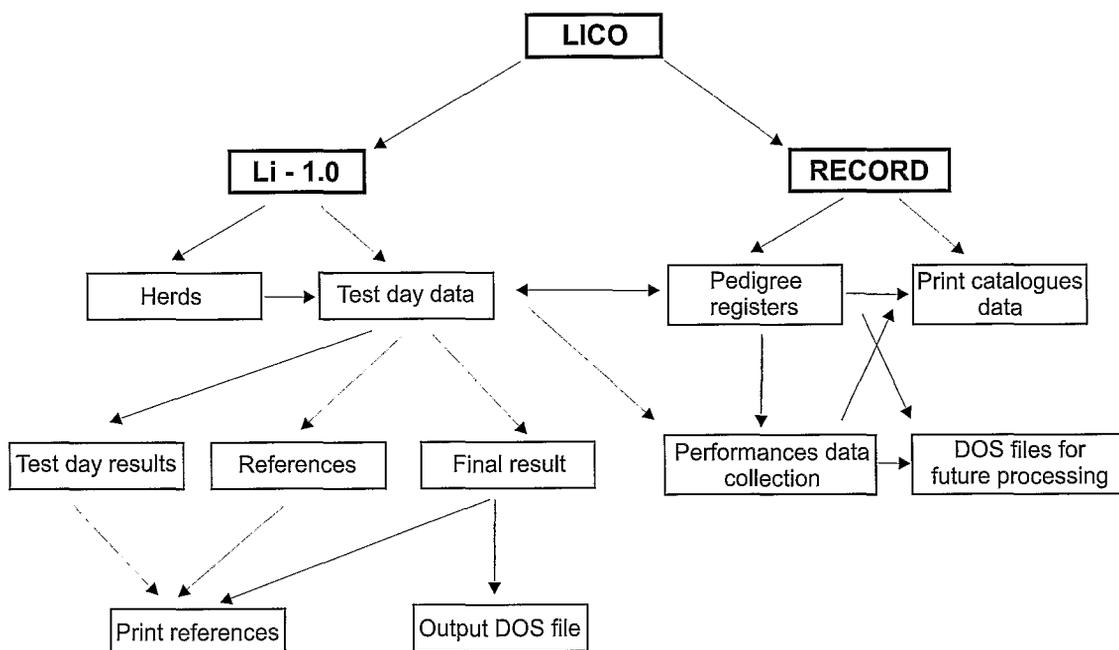


Fig. 1. Scheme of the information system for lactation calculation and data collection in dairy sheep - LICO.

Li_1.0 is a subsystem accepting and saving all information about herds and ewes during one year. Also this subsystem executes all calculations per lactation period and gives monthly and final references.

Structure of Li_1.0: control panel, data base, logical block

Control panel requires input of the next data: (i) year of milk recording; (ii) standard milking period (90, 120, 150 free choice according to the different breeds); (iii) minimum number of days.

These data have to be input at the beginning of each year in order be format tables of data bases for every new year.

The data base includes two basic tables: table of the herds and table of the test days. Table of the "herds" requires to input: names of the farmers, villages, maximum numbers of the ewes in the herd, date performing of milk recording tests, total volumes of milk produced by the whole flock per test day and per test milking. After input the last date of milk recording test about herd, it is necessary to input how many days after the date of the last test, the ewes from the whole flock have been dried off.

Table of the "Test days data" includes all information of the ewe from lambing to drying off. First of all the herd number of the ewe has to be input (or its name), date of lambing, number of born lambs, parity, and milk from the ewe during every test milking. The system automatically calculates the milk of the test day.

Test day results are a derivative function of the table "Test days data", providing references about test day results for ewes from every recording herd. In these references the ewes are sorted according to the milk yield during test day by herds. These medial results return to farmers and keep their interest to milk recording procedure.

Final results is a derivative function of the table "Test days data", providing references about calculated milk yield of whole milking period and milk yield of standardized milking period. This function calculates also average and maximum daily milk yield. It provides the possibility to print out references by herds that also return to the farmers.

References is a derivative function of the table "Test day data", providing detailed reference about calculated milk yield of 90, 120, 150, 180 days milking period. It provides a possibility of printing references of herds that also return to the farmers .

All references of derivative functions are saved permanently in the book. It provides the possibility to accelerate it preparing "Output DOS file" for statistical processing.

More than 30 user's defined functions perform the logic of the system.

RECOD is a second subsystem of "LICO" designed under MS Access 2.0. This is an information subsystem for collecting all information about the ewes by recording herds for years. Also some forms have been created for accepting the information from Li-1.0. RECOD generally includes two data base tables- "Pedigree registers" and "Performances data collection".

Pedigree registers is a table collecting pedigree information of breeding ewes and rams. These registers can be created for next (future) years as well as for past years. Pedigree registers are associated with macros giving a possibility to put automatically an individual code - unique for the whole population. Implemented system of coding provides successive code according the age in such a way oldest animal has a smallest number youngest animal has a biggest number. Pedigree registers are associated with second data base table - performance data collection.

Performances data collection is a table accepting and saving all information about the observed traits of the ewe (productive and reproductive) during the whole productive life. Both Pedigree and Performances data may be extracted from data base which provides easy way to print and issue catalogues, bulletins brochures. There exists a possibility of preparing DOS - files for further processing with other statistical packages.

LICO is an information system designed for extensive production models - small size of the herd, hand milking, etc. LICO has a special purpose to monitor many local sheep in Bulgaria and other breeds from Balkan region.

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