



Management of the B-system in a small country

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Abstract

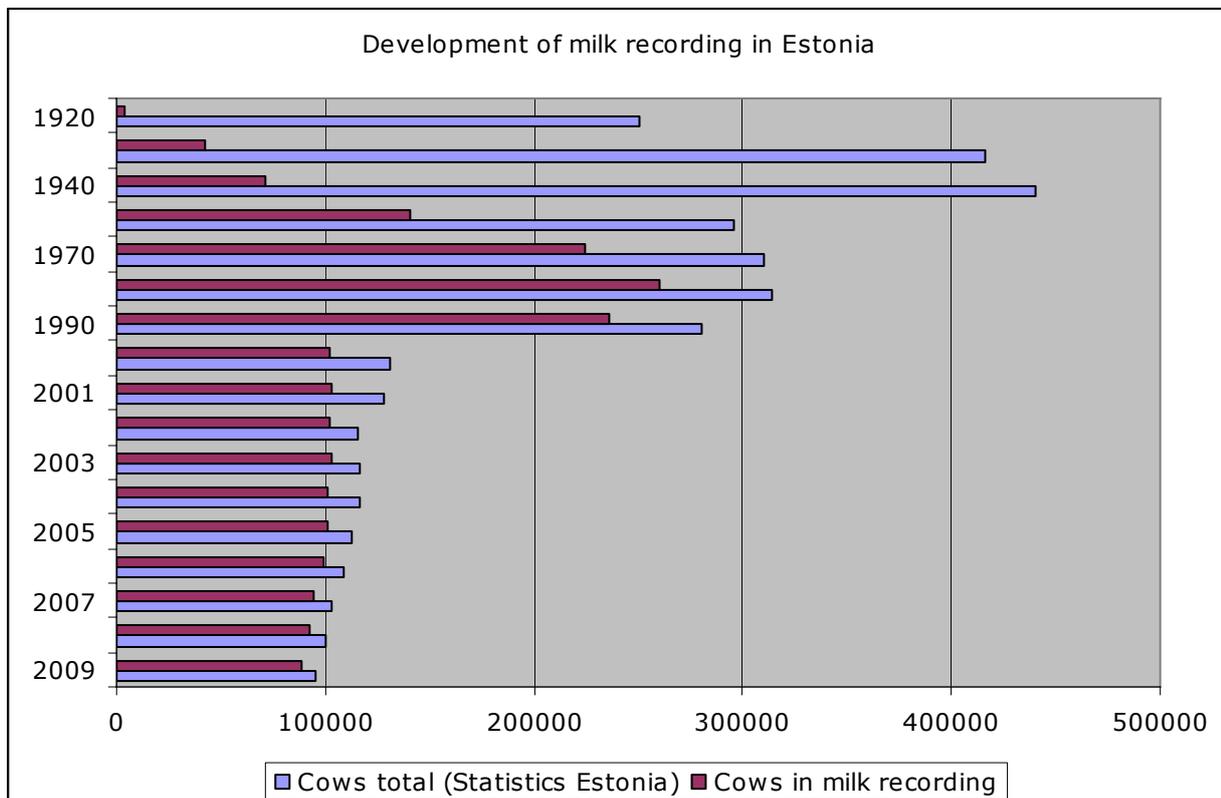
Although 92% of cows in Estonia are in milk recording, the size of population still remains smaller than in most countries. The Animal Recording Centre (Jõudluskontrolli Keskus) is a state agency which offers in addition to milk recording also services to the breeders of other animal species. The possibilities offered by the Internet have been successfully used for over 10 years during the process of animal recording system development in Estonia. Presently, 51% of farmers, who own in total 88% of cows in milk recording, use Internet-based solutions for dairy cattle recording.

Keywords: Milk recording, management.

1.0 Background

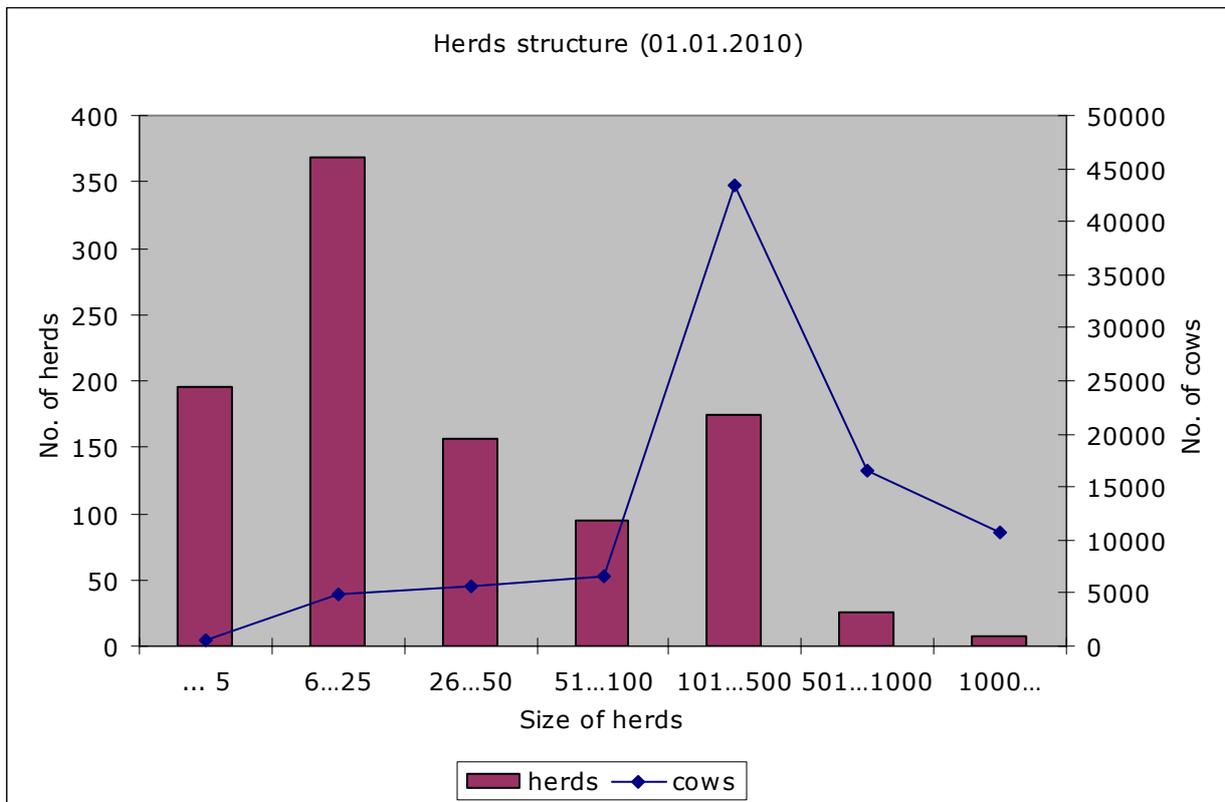
In Estonia, milk recording has a more than 100 years long history. Throughout the years milk recording has been organised through farmers' organisations, scientific institutions and, for the last seventeen years, an independent state agency.

The number of herds and animals has constantly fluctuated in the last twenty years. After the Republic of



Estonia regained independence, former state companies were liquidated. Instead of former sovhozes and kolhozes cooperatives and numerous small farms were established. Whilst there was a steep rise in the number of herds in milk recording, the number of animals did not change significantly at first. In recent years the total number of herds and animals is declining steadily. A corresponding trend is noted in the number of herds and animals in milk recording. The direct aid scheme for dairy cow breeding had a positive impact on the number of cows in milk recording as milk recording was one of the aid eligibility criteria.

In addition to the fluctuating number of herds and animals, the whole system of animal recording has undergone major changes. Between 1993 and 1998 a complete reform of the animal recording data processing system was undertaken during which a mainframe was replaced by personal computers. In the last 10 years, the dairy farms in Estonia have also undergone large technological changes. Around 50% of dairy cows are kept in farms that have been built or reconstructed in the past 10 years. Although an average size of a herd is 86 cows, the herd structure largely varies in Estonia, from one cow to two thousand cows.



Technological development has influenced every aspect of our life and using different e-services available via the Internet (e-voting, digital signature, Internet-bank, e-school) is very popular in Estonia. In addition to the development of the Internet mobile phones are very widely spread. The Estonians are good users of several innovative mobile services as they are of Internet-based e-services. Most widely used mobile-services are mobile-parking, mobile digital signatures and using mobile phones as identification when using different Internet-software.

2.0 Animal recording centre

2.1 Management and development of the organisation

In Estonia, milk recording is organised by the Animal Recording Centre. The Animal Recording Centre is a state agency under the supervision of the Ministry of Agriculture. As a state agency the Animal Recording Centre is directly accountable to the Minister of Agriculture. The Centre does not have a board comprising of farmers. The daily management of the organisation is a cooperative effort of the members of the

management. Although the services for dairy cattle are mainly developed in the Animal Recording Centre, farmers, breeding associations belonging to the farmers and Eesti Maaülikool (Estonian University of Life Sciences) are also involved in the process.

There are two distinct periods of development in the past twenty years. From 1993 to 2000 the system of animal recording and applicable technologies were updated. During this period a unified identification system was established, the first agricultural aids were paid out in Estonia and farm animals' registers were established. As milk recording system was very well developed and the majority of milk producers were participating in the system, the milk recording database was used as the base for the establishment of the farm animals register and it was also considered suitable for the initial administration of different agricultural aid schemes. From 2000 until today we have been improving the quality of our services and developing additional services. All our employees can see monthly summaries of how quickly animal recording results are issued, the total amount of invoices issued by each service and also the total receipt of money compared to our expectations. The employees directly communicating with the farmers can also see which services each client uses as well as the amount due from the client.

2.2 Other services

The primary service of the Animal Recording Centre is milk recording and other related services. In addition to milk recording we have made efforts to maximize resource utilisation and we offer IT-related services to the breeders of other animal species.

2.2.1 Cooperation with dairy cattle breeding association

In addition to dairy cattle performance data all data on animals used for breeding are collected into the database of the Animal Recording Centre. The Animal Recording Centre has developed several software programmes for the employees of the breeding association to help them in their daily work. Through these programmes insemination data and linear scoring data are entered straight into the database by the breeding association. The animal genetics laboratory of the Institute of Veterinary Medicine and Animal Sciences of the Estonian University of Life Sciences uses the database of the Animal Recording Centre in order to conduct compliance checks on animal data submitted for expertise analysis for genetic identification or verification of parentage data accuracy (suspected ID or HB number or the animal's date of birth is not known).

2.2.2 Pig performance recording and maintaining the animal breeding register

Eesti Tõusigade Aretusühistu (Estonian Pig Breeding Association) is the organization responsible for pig performance recording. The Animal Recording Centre has made an agreement with the mentioned association. The tasks of the Animal Recording Centre are to collect performance data, process it and conduct genetic evaluations and train pig farmers. The Animal Recording Centre has designed a PC software programme which is intended for daily farm management and data exchange with the Animal Recording Centre. In addition to breeding farms the fattening pig module of the same software is used by fattening farms to organise their day to day work.

2.2.2 Beef animal performance recording and maintaining the herd book

Eesti Tõuloomakasvatajate Ühistu (Animal Breeders Association of Estonia) is the organization responsible for beef animal performance recording. The tasks are divided between the Animal Recording Centre and Eesti Tõuloomakasvatajate Ühistu as follows: daily communication with the animal breeders (training and collecting ideas for development) is the duty of Eesti Tõuloomakasvatajate Ühistu and the Animal Recording Centre is responsible for data collection, processing and publishing. The Animal Recording Centre has also designed Internet-based software that was created for the beef breeders enabling them daily use of relevant data.

2.2.3 Sheep and horses performance recording and maintaining the herd book

The responsibility for organising sheep performance recording and maintaining the herd book lies with Eesti Lambakasvatajate Selts (Estonian Sheep Breeders' Association), Eesti Hobusekasvatajate Selts (Estonian Horse Breeders' Association) and Eesti Sporthobuste Kasvatajate Selts (Estonian Sport Horse Breeders' Association), two breeding organisations uniting horse breeders, are responsible for organising horse performance recording and maintaining the herd book. The underlying principles of the services offered to the sheep and horse breeders' organisations are very similar. The Animal Recording Centre is responsible for processing and maintaining data on sheep and horses. The duty of the respective breeding organisation is to communicate with the sheep/horse breeders and enter relevant data. The Animal Recording Centre has designed an Internet-based software programme for the breeding organisations (including their members) to facilitate their everyday work.

2.2.4 Selling ear tags

Although the Animal Recording Centre was the first organisation that started creating and developing animal identification system in Estonia, the official farm animals register is not presently included in the Animal Recording Centre's database. In 2000, the farm animals' register was given over to the Agricultural Registers and Information Board, a state authority that maintains all official agricultural registers. This state authority administers different aid schemes and the quota system in Estonia. The Animal Recording Centre has retained its intermediary role as the distributor of ear tags in the animal identification system. The Animal Recording Centre acquires the ear tags and sells them to the farmers, the Agricultural Registers and Information Board maintains the farm animals' register. In addition to selling ear tags, the Animal Recording Centre offers its clients registration of animal identification through the animal recording system. The clients of milk recording can also use the vehicle collecting milk samples as a means of transporting ear tags to their farm.

2.2.3 Raw milk quality samples for dairy processing industries

In addition to milk recording samples (fat content, protein content, somatic cell count, urea content) quality samples are analysed in the Animal Recording Centre's laboratory. Fat content, protein content, somatic cell count, urea content, milk freezing point, bacteria count and existence or non-existence of antibiotics are tested for dairy industries. These samples account for around 5% of all samples. The test results are forwarded to the dairy industries. The farmers can see the results via the Internet or order a message through SMS to their mobile phone.

3.0 Organisational structure of the animal recording centre/elements of milk recording system

In Estonia there is only one organisation engaged in milk recording. All elements of this service, starting from field service to genetic evaluation are centrally managed by the Animal Recording Centre.

3.1 Field service

As the B-system is used in Estonia, our field service is not engaged in taking milk samples every day which is why we have a small number of employees in the field service. The people working in the field service act as regional coordinators whose main tasks are to train the farmers and milk recording technicians, conduct herd visits and repeat recordings. In addition to the main tasks their duties also comprise introducing and selling various services (including goods) to our clients. A negative side of their work is that they have to deal with our debtors and follow the terms for checking milk meters (milk meters are the property of the animal farmers).

In order to facilitate the work of the field service and get a general overview, an Internet-based programme, containing all necessary data for routine work and applications for recording information, was developed in cooperation with the IT-department.

3.1.1 Certification of technicians

There are altogether more than 600 milk recording technicians in Estonia. As in case of the A-system a technician is a person who services several farms and receives payment for the services from the farmers. In Estonia, a farmer can also be a milk recording technician. In Estonia, a person is allowed to work as a technician after he/she has undergone appropriate training at the Animal Recording Centre and successfully passed the required test. This certification is valid for three years after which the technician will have to renew the certification.

3.1.2 Herd visits

One of the weaknesses of the B-system is that the communication with the farmers compared to A-system is less frequent because the farmers arrange test milking themselves. In order to strengthen client relations we have initiated a system in Estonia where our field service supervisor visits each farm at least once in three years. During the visit the field service supervisor will examine the general state of the farm, draw attention to deficiencies, if necessary, help in interpreting milk recording results and introduce additional services which the particular farm does not yet use. A herd visit together with observations will be saved in the database, ensuring thus that current information is available on the farm visits and enabling making various summaries on observations made by field service supervisors.

3.1.3 Repeat recordings

In order to avoid errors during test milking, we carry out repeat recordings. Repeat recordings are conducted in at least 5% plus one of herds in each county. Criteria for selecting repeat recordings are following:

- The herds that belong to the best herds by production and where no repeat recording has been conducted in past 3 years.
- The herds the production of which has significantly increased year on year.
- The herds the fat content in milk of which is high.
- The herds submitted for examination by a breeders' association.
- The herds chosen randomly.

In case the analysis of repeat recording shows a deviation from test milking exceeding 7% and the herd's fat content exceeding $\pm 0.25\%$ or there is a deviation in the recording data of a large number of cows, the reasons behind such deviations will be analysed and a new repeat recording will be carried out within 12 months from the first repeat recording. The results of test milking are replaced with the results of repeat recording.

3.2 Milk laboratory

Milk recording samples and quality samples are analyzed in milk laboratory. The duty of the milk laboratory is also to arrange the collection of milk samples. Sample collection is organised so that the farmers are concurrently informed of test milking results and the next milk samples collection date. Such system ensures that the number of milk samples to be analysed is distributed evenly throughout a month and the period between days of testing falls within established limits. There are around 300 milk samples collection points all over Estonia which are mainly located near larger dairy farms. In addition to the task of collecting milk samples, we also use the samples collection vehicle as a means of transporting ear tags if an animal keeper has subscribed to such service.

In April this year we introduced real-time QPCR-based DNA mastitis analysis.

3.3 Data processing

Data is centrally entered and processed in the Animal Recording Centre. The need to forward information on paper has decreased with the advances in technology. The animal keepers forward around 30% of information via the Internet by entering data online or sending a file saved from the farm management software to the Animal Recording Centre. This data is checked when it is entered into the database as well as during data processing. The farmers receive milk recording data via post and they can access the data via the Internet.

3.4 Genetic evaluation

Dairy cattle genetic evaluation is conducted three times a year. Characteristics evaluated are:

- Production traits by random regression test day animal model.
- Conformation traits by BLUP animal model ("PEST").
- Udder health trait by random regression test day animal model.
- Fertility traits by BLUP multi-trait animal model ("PEST").
- Longevity trait using "Survival Kit".
- Calving traits by BLUP multi-trait animal model ("PEST").

Estonian Animal Recording Centre is participating in Interbull's evaluation of bulls with the production, udder health and conformation data of the Estonian Holstein breed and with the production and udder health data of the Estonian Red breed.

3.5 IT as a developing unit

All computer programmes used in daily work have been designed in the Animal Recording Centre. Software intended for the farmers is developed as Internet-based software. An exception to the rule is the Possu- programme, intended for pig breeders, which is a PC programme. Using Internet-based software ensures that all farmers are at any given time using the most recent version of the particular software and we do not incur costs to deliver programme updates. As all software is created in the Animal Recording Centre we can respond very quickly to programme errors and immediately repair them. We can also promptly deal with the needs of the farmers related to programme improvement. A situation typical for the largest herds in Estonia is that milk is produced on several farms and there are a number of people who enter or look up data. The advantage of Internet-based software is that all these users see the most recent information.

4.0 Conclusion

The reasons for the popularity of animal recording in Estonia are long traditions and good cooperation with the farmers and breeding organisations. The most significant shortcoming of an animal recording system in a small country is the continuing decrease in the number of animals, although we are able to provide services for a larger population because of investments made. The wide use of the Internet and innovative attitude of the farmers has supported us in our endeavour to provide an efficient service. The Internet helps us to keep software servicing costs low and the exchange of information between the farmers and the database is conducted quickly which in turn increases the level of satisfaction with the service. Our in-house developing team enables us to respond very rapidly to the needs of the farmers and we can independently develop new services without being hindered by external factors. The services offered to the breeders of other animal species contribute to lower information technology related costs.