Restructuring of milk quality, production and milk recording in Lithuania

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Summary

Lithuania started to implement its economic reforms in 1990. Former State-owned collective farms were radically restructured. Almost three-quarters of all cattle and the majority of pigs are reared by farmers and on household farms. This situation hampers the introduction of advanced methods of animal husbandry and does not allow the production of higher quality milk because farmers lack income for acquiring equipment and reconstructing buildings. The State supports the efforts of farmers aimed at restructuring the livestock sector in order to produce marketable products and maintain farmers' income. In order to upgrade local breeds and to produce high quality milk, milking cows are imported and new technologies are supported. The year 1998-1999 witnessed an increased milk yield of recorded cows. Average milk yields were 4 250 kg with 4.26 percent fat and 3.16 percent protein per cow per year. The milk yields were higher by 125 kg and fat by 0.01 percent higher in comparison to the 1998 milk recording year. At the end of 1999 one third of purchased milk was of the highest quality while in 1997 it made up only 10 percent.

Introduction

Lithuania which has deeply rooted traditions of animal breeding and puts great emphasis on its development has thereby considerable potential for the development of the dairy sector. The efforts of animal breeders and growers have played a big role in the dairy sector development but the sector was also influenced a lot by the historic, climatic and economic conditions and other circumstances.

Lithuanian farmers always found it necessary to keep productive animals. They were eager to rear good young stock for renovating or expanding their herds or for sale. We are satisfied by the substantial increase in cow productivity during the recent years, the considerable improvement in the structure of our cow herds and the assiduous and efficient work of many private farmers and agriculture companies.

When Lithuania restored its independence and started sweeping economical reforms which brought about radical changes in the farming sector and land ownership relations, animal stock decreased for some time. To our great satisfaction, Lithuania was able to stabilise and reverse this trend. The problems of restocking still exist in some CIS countries that used to be a primary outlet for our pedigree animals. We hope that our neighbours will overcome their economic difficulties and this will increase their demand for our animals and reopen markets again.

Pre-independence agriculture

Lithuania, as in the other Baltic countries, went through a rapid period of industrialisation and collectivisation of agriculture under Soviet rule. Livestock and dairy production was the major agricultural activity and accounted for over three-fifths of the total agricultural output. The country was a major supplier of livestock and dairy products, while feed grain and other needed inputs were delivered to the country according to the central planners decisions.

Reforms in the food and agricultural sector started rather early, parallel to the struggle for independence. Lithuania initiated a transition programme in food and agriculture to create an internationally competitive sector similar to what is found in Central European countries. Land reform and privatisation, liberalisation of the macro environment, creation of a new incentive framework and institutional and legal reform, represent the major components of this programme. Achievements in reforming the food and agricultural sector have been significant so far, however, they lag behind reforms in other economic sectors and in the macro-economic environment as a whole.

- Evolving farming structures. In 1989 before independence, agricultural production was reorganized. In the past several years all of these farms have been reorganized and privatised.
- Agricultural Companies. Larger, corporatised farming enterprises were created as a result of the privatisation and transformation of the State and collective farms. In addition to primary agriculture, the agricultural companies are also involved in food processing and trading activities. Initially 4 279 agricultural companies were created in 1992 but their number declined to 1 000 using only 12.1 percent of total agricultural land.
- Family Farms. The first family farms were established before independence through the Law *on Peasant Farms,* which allowed rural inhabitants to receive user rights on land up to 50 ha. As a result of land restitution and the break-up of the traditional large-scale farms, almost 200 000 new family farms were established, which accounted for 42.1 percent of total agricultural land and together with household farms, 75 percent of production.
- Household Plots. There are about 300 000 household plots, averaging about 2.2 ha in size. These are often operated by the shareholders of agricultural companies or by rural inhabitants to supplement their

income from other sources, while the number of household plots is declining.

- Other State Land Users. A significant portion of State-owned agricultural land is currently used for thousands of garden plots operated by urban dwellers, as well as by research and educational establishments.

Livestock production

Livestock numbers have declined by about 50 percent since 1991. However, the structure of the cow herd has changed dramatically as many of the large dairy herds in agricultural companies did not survive and production is now more widely dispersed in many very small farms and household plots. This is very inefficient and has led to declining milk yields and a higher proportion of low quality milk supplied to processors.

The main reasons that predetermined such a situation in the Lithuanian milk sector were as follows:

- restructuring of the milk processing industry, which determined a sharp decline in raw milk consumption;
- restructuring of primary milk production, that was stimulated by the property transformation in the agricultural sector of Lithuania (e.g. establishment and development of private farming). At the beginning of 1991 more than 60 percent of dairy production was concentrated in agricultural communities. Until the end of 1996 the situation absolutely changed: 84 percent of dairy production was produced in the private agricultural sector while the share of agriculture enterprises decreased to 16 percent.

The result is a declining livestock inventory, combined with a decreasing marketing efficiency causing the drastic reduction in output of livestock products (beef, milk, pork, mutton / lamb and egg production) (Table 1).

Animal breeding

At present, there are in total 18 breeds of cattle, ten breeds of pigs, eight breeds of horses, five breeds of sheep and five breeds of goats in our country. In this number, the following Lithuanian local breeds are currently used in the breeding process on a large scale.

There are two main cattle breeds in the Republic: the Lithuanian Black-White which are most popular in the south-west and make up 65 percent and the Lithuanian Reds in the north-east of Lithuania making up 35 percent.

The number of milk recorded cows in agricultural partnerships (agricultural companies) has decreased, but it has increased on private farms. There are currently 1 160 000 cows being milk recorded. Forty-six thousand or 40 percent of all milk recorded cows belong to agricultural

Table 1. Livestock and poultry in all farms (thou.)

	1989	1991	1993	1995	1996	1997	1998	1999	2000
Cattle	2 435	2 322	1 701	1 152	1065	1 054.1	1 016.3	927.7	849
of which cows	849.5	842	737.8	614.9	580	589.9	582.8	541.0	500
Pigs	2 705	2 435.9	1 359.8	1 259.8	1 270	1 127.6	1 200.1	1 167.7	921
Sheep	75	56.5	51.7	40	32.3	28.2	24.0	15.9	13.8
Goats	3.6	5.2	8.8	12.4	14.6	16.9	18.5	23.8	24.7
Poultry	17 231.1	16 815	8 258.9	8 848.8	8 444.2	7 775.4	7 423.2	6 776.7	6 122
Horses	78.3	79.9	79.7	78.2	77.6	81.4	78.5	74.8	74.8

partnerships and 70 000 or 60 percent belong to private farmers. Of these 116 000 milk recorded cows, 78 880 (68 percent) represent Black and White Cattle and 37 120 (32 percent) Red Cattle.

The year 1998-1999 witnessed an increased milk yield of recorded cows. Average milk yields were 4 250 kg with 4.26 percent fat and 3.16 percent protein per cow per year. The milk yields were higher by 125 kg and fat by 0.01 percent higher, in comparison to the 1998 milk recording year.

Milk recording service

The dairy herd improvement is impossible without systematic animal recording and milk recording. In 1923 milk recording was started in Lithuania. A large-scale organized cattle breeding system and cattle breeding service were developed in 1958. The system allowed the introduction of milk recording on a higher scale. The publication of annual reports on milk recording was renewed in 1959. Since then annual reports have been issued and published every year.

The milk recording service is responsible for milk recording on a nation-wide level. Milk recording on individual private farms is carried out by control-assistants according to agreements and milk recording in herds belonging to agricultural companies, is carried out by cattle breeding advisers of the farms according to agreements with milk recording services. The control assistants are managed by managers of milk recording services on a regional level.

The main method (67 percent) used for milk recording is A4. About 33 percent of the farms used Al type of milk recording in Lithuania.

The forward registration in milk recording herds is fixed for:
- card for animal pedigree;
- journal for animal insemination, reproduction recording, gynaecology analysis registration;
- the journal of new born animal registration.

Productivity is not computed when: the production of milk fat (kg) per first year of milk recording or first 305 days of lactation is less than 50 percent and during other years of milk recording or 305 days for lactation, less then 60 percent compared to the average in the herd.

Data processing

The development of computer programs for the needs of milk recording database management was started in 1967 when the Lithuanian Institute of Agriculture Economics acquired a large computer Minsk 22.

The first version of the cattle breeding information system (GVIS) was introduced in 1969. The system was developed by the introduction of a large number of animal recording items and by the adaptation of the system

according to the changes of the cattle breeding management system. Since 1979 the system has been introduced to all milk recorded dairy herds in Lithuania.

The sub-system for cows including dairy herd reproduction data analysis has been developed at the computer centre. In 1988 all cows on collective and State farms were being milk recorded (a total of 553 000 heads).

The GVIS sub-system for pedigree bulls has also been developed. The sub-system was transferred to personal computers and introduced in all regional cattle breeding enterprises (AI stations). In 1993 the sub-system for cows was transferred to personal computers and all information was transferred from large computing machines into personal computers in 1994. From 1999 we started to calculate dates in Oracle.

Milk testing system organization

In 1993 the reorganization of the milk laboratories was started in order to improve the national animal breeding system by the establishment of a central accredited milk composition and quality analysis laboratory for cattle breeding purposes instead of the former four regional milk testing laboratories at animal breeding enterprises.

In the opinion of the PHARE project which was executed during 1992-1997, it is enough to have one central raw milk research laboratory in small countries like Lithuania, where high cost analytical equipment and professional specialists are concentrated, to make milk analysis services for various departments and to be an arbiter in argumentation of various milk research questions.

In the period 1993-1997 the State enterprise “Pieno tyrimai” was equipped with modern laboratory facilities for milk testing as well as auto-refrigerators and containers for transportation of milk samples. The laboratory equipment gives the possibility to very quickly test fat, protein, lactose, dry matter, urea, lemon acid, bacterial pollution, added water, cell count and some virus and pathogenesis diseases with high accuracy in one milk sample.

All working places were fully computerised; the internal laboratory control system was developed and introduced. Many important problems, related to routine milk sample checking in the laboratory, were solved practically and effectively.

The State enterprise “Pieno Tyrimai” laboratories, working under “Good Practice Laboratory” regulations, is able to ensure qualified milk tests, cattle selection, payments for milk, sanitation and consulting services, without using any other technical and financial resources.

Milk quality

In 1992-1993 the reorganization plan for milk quality and the composition research system was made for the next five years. The plan included changing the relations between the milk producer and milk processing plant, giving the opportunity to a milk producer to efficiently manage his farm and the milk processing plant to have more flexible milk prices, giving the main attention to the raw milk composition and quality requirements.

The laboratory makes more than 20 million milk sample tests per year. In 1998 when the milk composition and quality research was made under separate requirements for the purchase of raw milk, the number of tests significantly increased

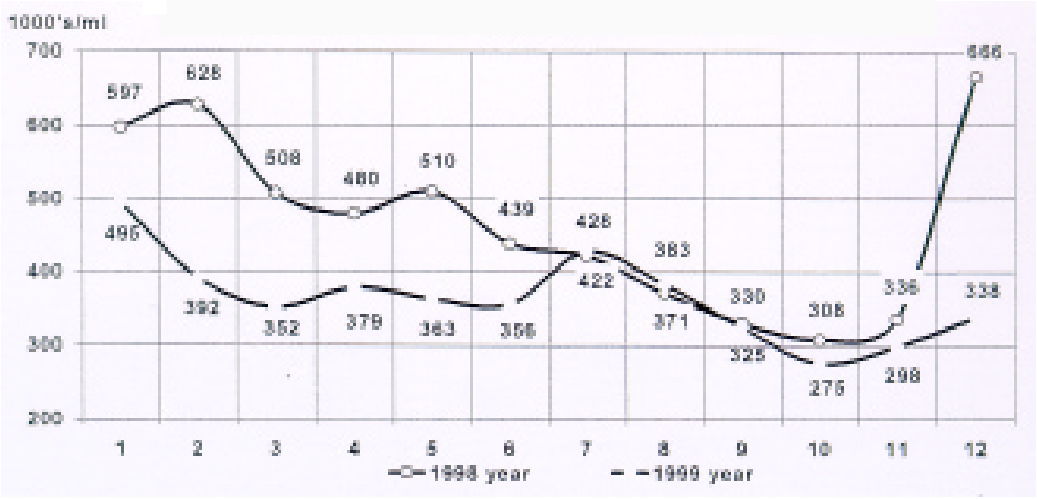

Figure 1. Change the average numbers of somatic cell per 1998-1999.

Since 1998 when the "Pieno Tyrimai" laboratory started its activity, the quality of milk has greatly improved. The quantity of somatic cells and bacteria pollution decreased. Recovering of milk production started in 1997. In 1997-1998 the average annual growth of milk production was 2.7 percent. At the same time the average annual growth of the milk yields reached 12.5 percent. Nevertheless, the most important tendency of the development of the milk sector in Lithuania was the improvement of the quality of raw milk. At the end of 1999 one third of purchased milk was of the highest quality while in 1997 it had made up only 10 percent.

Animal Identification in Lithuania

As the self-sufficiency with animal products is very high (namely milk and meat), the development of the export trade is the only possibility to maintain the considerably high production potential. Furthermore, animal breeding is a traditional activity in Lithuania with a high demand potential for exporting breeding animals to CIS countries. These two facts, together with the necessary control of animal infection diseases, are the main reasons for the implementation of an animal identification system according to EU standards.

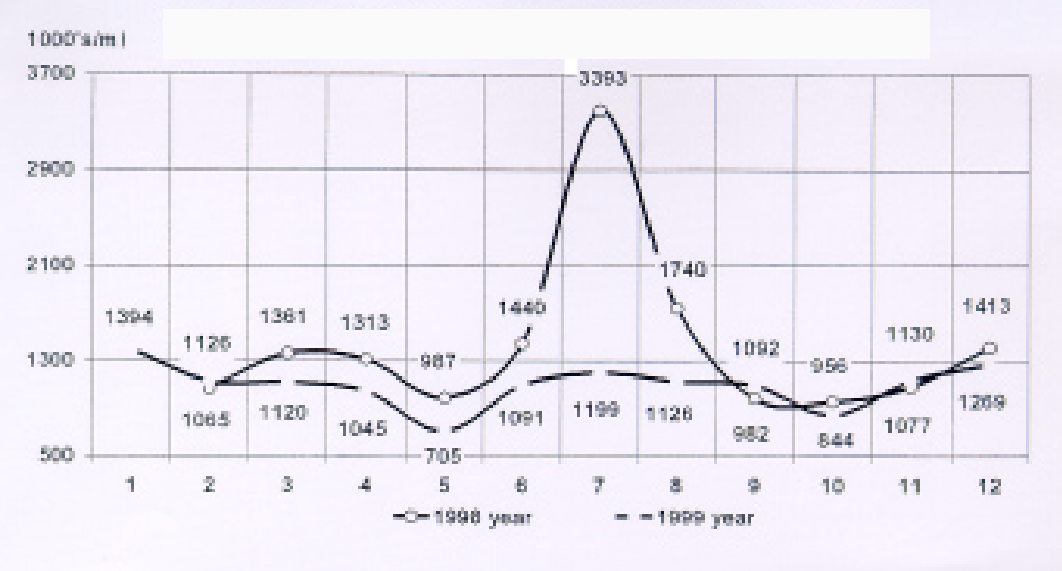

Figure 2. Change the average number of bacteria pollution per year during 1998-1999.

The current identification system, already taking into consideration the EU requirements, includes 500 000 cows out of the total number of about 1 000 000 cattle. This system meets EU requirements and includes a numbering system with a unique number for each animal and a central, computerised database.

The tags contain the following information: LT followed by eight characters; the first two are the code of the region, the next two are a serial number and the last four are the individual numbers of the animal. The characters are branded and the use of any written characters is not allowed. The lost tags are replaced by tags with the same number, provided by the producer on request of the responsible institution. Imported animals are identified additionally by Lithuanian tags. The tags are ordered by the regional officers of the veterinary and animal recording service. There is a register of animals on large holdings, i.e. former cooperatives and so called agricultural partnerships. In fact, all the partnerships are involved in animal breeding. A considerable number of private farms are also included in the breeding system. They share a comparably low number of animals, which, however increases steadily.

We want to restructure animal breeding in such a way that it would produce only such products which are in demand in markets, can be rented and give enough income to farmers. We subsidise 50 percent of the price of highly productive animals imported from abroad and 80 percent breeding value to sell in the country. Some joint stock dairy companies also help farmers to establish and develop commercial farms.

Conclusions

The main reasons for the improvements could be defined as follows:

1. From 1996 the standards of the quality of the milk were set up. They are set out in the Regulations of the milk quality estimation. This enables farmers to keep milk production in conditions that correspond to the high requirements of milk processing enterprises.
2. In 1994 the State enterprise "Milk Quality Analysis" was founded. The aim of this institution was to provide milk quality analyses as the producers of high quality milk get subsidies for their production. In 1998 the farmers' additional incomes, due to the increase in the quality of the milk, were estimated at 6.8 million LT, in 1999 additional incomes reached 50 million LT, while the annual expenditure of milk quality analysis institution makes up about 18 million LT.
3. In 1997 the Rural Support Fund was founded. Although the main part of the financial resources of the Fund is used for subsidising primary agriculture production, the Fund provides financial aid to farmers, who implement investment projects as well. In 1998 the development of the primary milk sector was defined as a special measure of the Fund. Also, in 1998 the total amount of the State aid for implementing the milk sector development projects was 3.2 million LT, in 1999 - 5 million LT, which made up more than 14 percent of the total State agriculture investment support.
4. In order to bring about desired changes, it will be necessary to:
   - improve the quality of animals by performing breeding work with pure-breed stock and by using imported genetic potential;
   - bring the number of cows under control up to 70-80 percent;
   - improve animal identification methods;
   - unit animal growers into associations and cooperatives;
   - continue improving the management of animal breeding;
   - set priorities in the animal breeding sector.

References

Petruskevicius, R. & Svitojus, A. 1998. Milk testing system organisation in Lithuania / Cattle Identification and Milk Recording in Central and Eastern European Countries. ICAR, Technical series, No. 2, Warsaw, 1998, 99-104.

Svitojus, A., Uleviciene, V. and Radeviciene, R. 1999. Animal breeding calculations and evaluation information system in Lithuania / Baltic Animal Breeding Conference. Baisogala. 1999, 189-194.

Counties of Lithuania. Economic and social development. Statistics Lithuania. Vilnius, 1999.