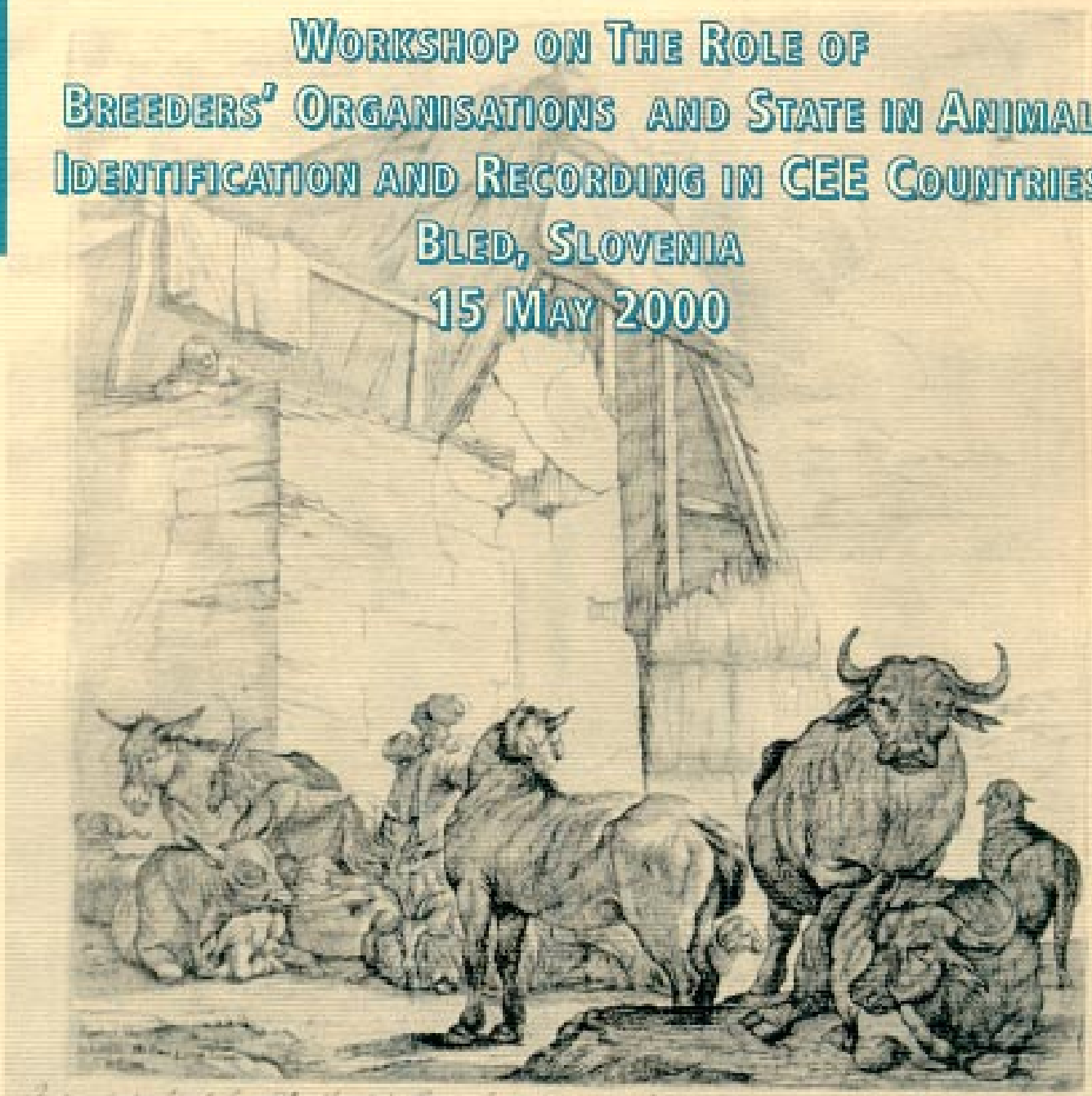
ISSN 1563-2504
ISBN 92-95014-01-4

ICAR Technical Series No.5

Workshop on The Role of Breeders' Organisations and State in Animal Identification and Recording in CEE Countries

Bled, Slovenia
15 May 2000



Editors: T. Vares, F. Habe, M. Klopcic & D. Kompan

April 2001

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Organisers concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

Cover page: 17th century engraving by Pieter Jacobsz van Laer of Haarlem, dit Bamboccio, (1599-1642), representing a livestock farm in the Latium region of Italy

Title of the Series: ICAR Technical Series

Title of the Volume: Workshop on Role of Breeders' Organisations and State in Animal Identification and Recording in CEE Countries

Editors: T. Vares, F. Habe, M. Klopcic & D. Kompan

Publisher: ICAR, Villa del Ragno, Via Nomentana 134, 00162 Rome, Italy

Responsible for ICAR Technical Series: Cesare Mosconi

ISSN: 1563-2504

ISBN: 92-95014-01-4

In the same series:

- K.R. Trivedi (Ed.), International Workshop on Animal Recording for Smallholders in Developing Countries, Anand (India) 20-23 October 1997. I.T.S. no. 1.
- T. Vares, M. Zjalic & C. Mosconi (Eds), Cattle Identification and Milk Recording in Central and Eastern European Countries, Warsaw (Poland), 23 August, 1998. I.T.S. no. 2.
- S. Galal, J. Boyazoglu & K. Hammond (Eds), Developing Breeding Strategies for Lower Input Animal Production Environments, Bella (Italy) 22-25 September 1999. I.T.S. no. 3.
- B. Moioli, J. Mäki-Hokkonen, S. Galal & M. Zjalic (Eds), Animal Recording for Improved Breeding and Management Strategies for Buffaloes, Bled (Slovenia) 16-17 May 2000. I.T.S. no. 4.

All the above publications can be downloaded from the ICAR home page: www.icar.org

The International Committee for Animal Recording (ICAR) wishes to express its appreciation to the *Ministero per le Politiche Agricole e Forestali* and to the *Associazione Italiana Allevatori* for their valuable support of its activities.

ICAR would like to express its appreciation to the following Institutions for the financial support given to the meeting:

- the FAO-SEUR (Subregional Office for Central and Eastern Europe),
- the Ministry of Agriculture, Forestry and Food of the Republic of Slovenia,
- the Ministry of Science and Technology of the Republic of Slovenia, and
- the University of Ljubljana, Biotechnical Faculty, Zootechnical Department.

The Role of Breeders' Organisations and State in Animal Identification and Recording in CEE Countries

Proceedings of the Workshop held in Bled, Slovenia, 15 May 2000

Editors: T. Vares, F. Habe, M. Klopcic & D. Kompan

April 2001

Table of Contents

ICAR's mission and its importance for Central and Eastern European Countries

J. Crettenand
President of ICAR

Swiss Simmental and Red&White Association,
Rüttistrasse, 3052 Zollikofen, Switzerland

History

In 1951 an organisation called the "European Committee on Milk-Butterfat Recording" was formed in the Hague, the Netherlands. This was the first formal establishment of an international non-governmental recording organisation.

During the following 40 years the committee was renamed several times and expanded from cows to cover sheep and goats and all aspects of animal recording. The number of member organisations increased world-wide. In 1990 the actual name „International Committee for Animal Recording (ICAR)" was adopted in Paris.

In 1992 the new ICAR Constitution, the new International Agreement of Recording Practices and the new Special Stamp Rules (A quality label to be applied by the member organisations meeting the ICAR requirements, on their official recording documents) were adopted.

In 1999 ICAR is registered in Paris, France, in accordance with French law as an international non-governmental (INGO) and non-profit organisation.

ICAR is today the world-wide organisation for the standardisation of animal recording and productivity evaluation. Its aim is to promote improvement of farm animal recording and evaluation through the formulation of definitions and standards for the measurement of traits of economic importance.

ICAR's mission

ICAR's mission, according to the proposed strategy plan, is to provide benefits to its member organisations through actions that they cannot do efficiently themselves:

- providing information and services which help member organisations to develop, operate and manage their business;
- providing information and services which promote benefits of recording and evaluation, thereby increasing the demand for the services provided by ICAR member organisations;

- providing guidelines and standards which facilitate the provision of services and the exchange of information by member organisations both nationally and internationally; and
- providing a body through which member organisations can work together to achieve shared objectives.

Structure and functions

The present structure of ICAR as a registered non-profit INGO provides for full participation of its members in developing - among other things - guidelines and recommendations on the basis of the sound scientific evidence. Guidelines represent a minimum of the requirements set up to ensure a satisfactory degree of uniformity of recording among member countries, and a maximum flexibility in the choice of methods.

The signing of the International Agreement is the main commitment of any member when joining the organisation. ICAR actually has 47 participating countries (Table 1).

New members must meet ICAR's requirements within two years of the signature of the agreement. They must inform the Board on the requirements to be complied with in their country and submit an annual report.

The success of ICAR activity depends on the work of its Sub-Committees, Working Groups and Task Force. Results are presented during the regular General Assembly, which is held every two years, hosted by a member organisation.

Table 1. ICAR member countries.

Argentina	Greece	Norway
Australia	Holland	Poland
Austria	Hungary	Portugal
Belgium	India	Romania
Bulgaria	Ireland	Scotland
Canada	Israel	Slovak Republic
Croatia	Italy	Slovenia
Cyprus	Japan	South Africa
Czech Republic	Jersey	Spain
Denmark	Korea	Sweden
Egypt	Latvia	Switzerland
Estonia	Lithuania	Tunisia
Finland	Luxembourg	Turkey
France	Mexico	USA
Germany	New Zealand	Zimbabwe
Great Britain	North Ireland	

There are three sub-committees, one task force and thirteen working groups currently in the structure. Details are given in figure 1.

Importance of ICAR for CEE Countries

Actually twelve organisations from eleven Central and Eastern Europe countries are members of ICAR.

Many CEE countries follow already ICAR guidelines and standards. So they are already in harmony with international standards. This fact will facilitate their future integration in European Union.

ICAR Special Stamp is already granted to Czech Republic and Slovenia. Other CEE countries have the goal to receive the Special Stamp.

The representatives of CEE countries in ICAR Board, Sub-Committees and Working Groups have an influence on guidelines and benefit of a transfer of knowledge. These representatives have the possibility to participate actively in ICAR meetings and workshops.

The ICAR members in CEE countries have the possibility to use the current and new services of ICAR and its Sub-Committees and Working Groups like the international evaluations provided by INTERBULL for production and conformation traits or the ICAR Reference Laboratory Network.

The experience gained from ICAR West European organisations help the ICAR members in CEE countries in developing their own models and approaches in order to meet actual and future needs of their clients.

Future strategy of ICAR

In developing a long term strategy plan covering all the activities of ICAR, the following points were considered:

- New ICAR's mission to provide benefits to its member organisations
- New ICAR structure with new membership fees structure
- Cover all aspects of registration, recording and evaluation of data for cattle, sheep and goats
- Improve the quality of the total process of recording and evaluation
- Fellow a growth strategy to attract members from new countries specially from Central and Eastern Europe, South America, Africa and Asia
- Work closer with other international organisations dealing with animal recording

I am confident that the future strategy of ICAR will be successful thanks to the active support of the member organisations.

Structure of ICAR

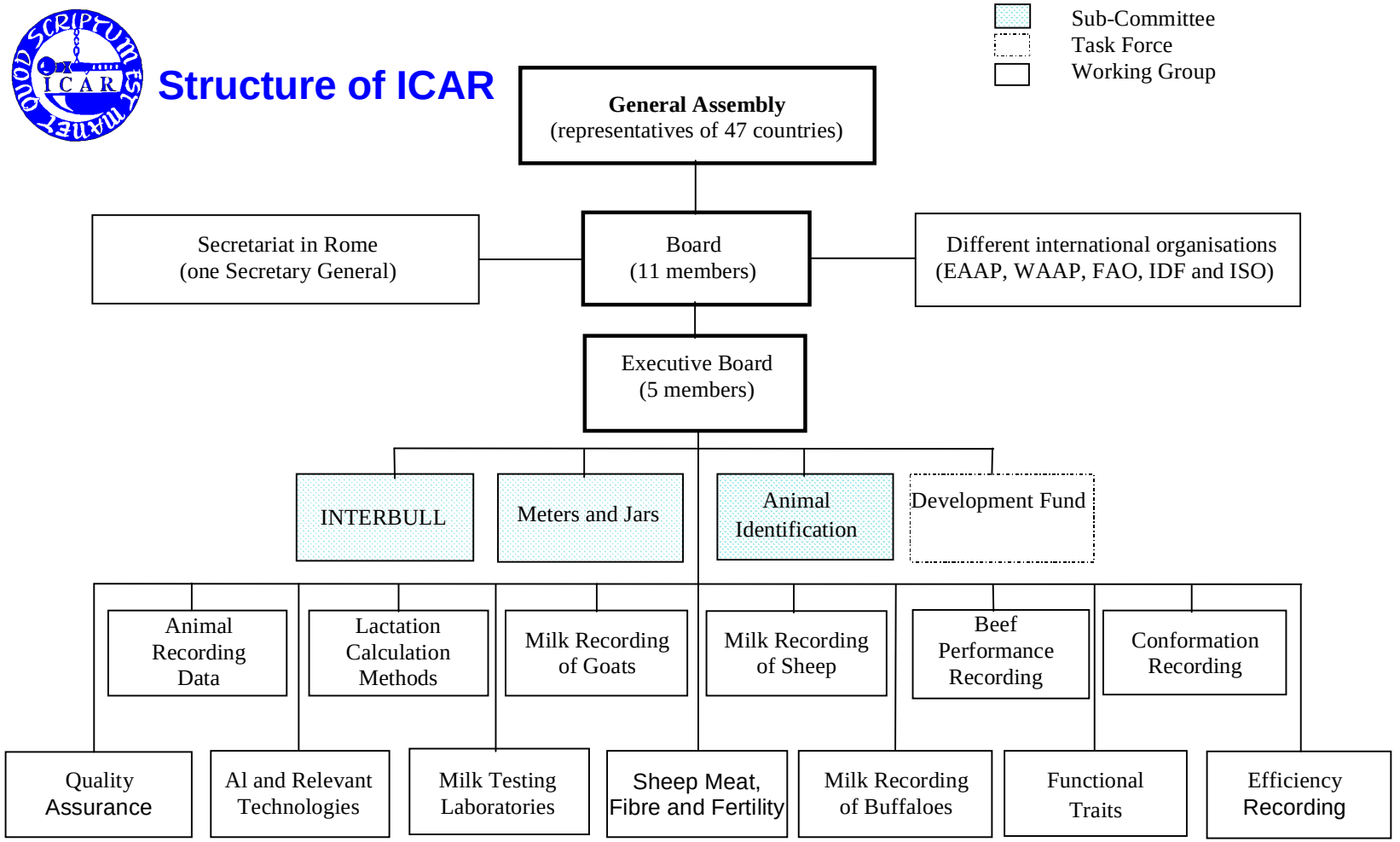


Figure 1. Structure of ICAR

FAO activities in support on the restructuring of the animal production sector in Central and Eastern European Countries (CEECs)

T. Vares

FAO, Sub-Regional Office for Central and Eastern Europe,
Benzúr utca 34, 1068 Budapest, Hungary

Background

The livestock sector was an important part of agriculture in most of the CEE countries during socialism and has maintained its importance during transition. All the countries experienced massive structural changes in markets, production demand pattern, price structures for livestock products and for production inputs. As a result, most of the livestock production systems are in the process of reorienting their production intensity as well as the direction of the production itself. CEE countries make efforts to build up the institutions and organizations needed for contemporary livestock production. On one hand the State is giving more responsibility to the private sector, on the other hand the Government is strengthening national institutions to evolve EU regulations and other international standards on livestock production and products (animal breeding, feed control, trade, animal health, product quality, housing and welfare, environment, etc.). EU regulations concern all countries in Central and Eastern Europe (CEE), which wish to trade animal products to the EU, additionally EU accession is a national policy for most of the countries in CEE.

A decade after the fall of the Berlin wall, the CEECs' transition from former, centrally planned economies to functioning market economies is in full progress with sound support from the international community. Although transition economies shared many of the failures that led to the demise of the central planning model, there are significant differences between the countries in transition. There is no procedure and only a few experiences of successful conversion of former socialistic livestock production systems and institutions into the market-oriented structure. Many dilemmas imposed by transition into the market economy in the countries in transition within the next years are anticipated. The progress of the strong private sector in agriculture will require pertinent infrastructure, especially in the livestock sector.

Changes which relevant institutions and businesses will need to anticipate and implement as part of adjusting to the single market rules and supporting international quality standards are to be positioned in the best possible way to meet the countrywide needs. CEE countries often fail to copy the organizational structures of western countries and adjustments are needed to support the local needs in the most efficient way. The development of the livestock sector in CEECs may or may not copy the pattern of the developed world, where the livestock sector was gradually enhanced in relative isolation and was genuinely protected by several trade immobility factors of that era. Additionally public interventions were introduced and domestic animal production and breeding are not only publicly supported in industrial countries, but also strongly protected, by tariff and non-tariff barriers. CEE countries have the challenge to compete in open markets, improve production efficiency, product quality and maintain natural resources. For some countries the major task is to carry on accession to the EU, which is in the middle of reforming its policy, institutions and procedures.

FAO's comparative advantage lies in its ability to draw lessons across countries and regions and to bring best practices to bear in meeting country-specific needs especially in minimising the tensions that may arise as a result of the process of transition.

International Organizations in Livestock Development

Generally there are two types of international organizations. The first group comprises intergovernmental organizations, where members are national governments (e.g. United Nations (UN) and the Food and Agriculture Organization of the UN (FAO).

The second group of organizations is usually called non-governmental organizations (NGOs) and civil society organizations (CSOs), whose members are national institutions and organizations. The most important international NGOs, involved in livestock development are: the International Committee for Animal Recording (ICAR), the European Association for Animal Production (EAAP), the International Dairy Federation (IDF) and many others.

The Food and Agriculture Organization of the UN (FAO) is an international agency with its mandate (approved by Member Nations) being to take care of the development of the agriculture and food sector. Among many regional and country offices in the world, FAO has also established a Subregional Office for Central and Eastern Europe (FAO/SEUR).

The FAO/SEUR Livestock Programme in Central and Eastern Europe

The four key areas of SEUR's Regular Programme are:

1. Restructuring institutions and services of animal production and health:
   - the optimal assignment of the State, NGOs and the private sector in extension and advisory services for smallholders and large farms;
   - managing animal feed resources and maintaining feed and food quality and safety;
   - organization and delivery of national services (animal recording, breeding, research / development, training, information, laboratories).

2. Livestock Production Systems Sustainable Development:
   Sustainable development strategies overall need improved (multidisciplinary) methodologies to better involve the local resources and knowledge into integrated development in the country. These programmes aim at a better overview of the process and indicator sustainability and decision support on livestock farming at the local level.

3. Management of Farm Animal Genetic Resources (AnGR):
   FAO is responsible for the operation of the Global Programme Management of Farm Animal Genetic Resources (AnGR) and this is one of the priority areas for AGA. Management of AnGR in the broad sense is an important issue in SEUR's overall programme (including areas 1 and 2). More specifically SEUR's programme contributes to the regional networking and training of national coordinators and informal contacts for AnGR.

4. Direct support to Member Nations, to the field programme and liaison with regional networks and international NGOs on livestock development.

Technical cooperation programme on livestock programme

Several project proposals are prepared for submission to international donors where FAO / SEUR has been involved during the inception period of the project: project formulating, project document, seeking of possible donors and submission. Two projects have been approved for external funding. Five project proposals (on AnGR management) in preparation and seeking possible donors and two more regional projects (to be submitted to the EU) are in preparation in the field of animal feed resources and sustainable livestock farming systems.

Partners and resources

Within FAO's mandate and the scope of AGA's programme, the SEUR livestock production programme is aiming to integrate all (always-limited) resources available to evolve the CEE livestock development.

In addition to official liaison with INGOs (ICAR and EAAP), good contact with NGOs and regional INGOs exists. Additionally there are a number of partners involved in the livestock development in the Region, the best contact being that with German, French and Austrian institutions, which have funded several workshops and project preparation. Besides EAAP CG, a network has been established within CEECs and CIS with focal points for different functions (e.g.: research and extension, government institutions, breeding organizations and FAO national coordinators for AnGR).

Partnerships have allowed:

- country-experts to participate in the workshops (usual attendance is 60-80 people from CEECs);
- the invitation to people from the least developed countries;
- the opting for a broad range of emerging topics (1-3 each year);
- the publication and distribution of the proceedings;
- the involvement of the best experts in the field as resource persons;
- the initiation of some field projects for external funding.

Conclusions

National experts in CEECs exercise the transition at the national level, but also gain experience at international level. Newly independent states are becoming actively involved in the international intergovernmental organizations and national institutions are joining INGOs. It is important that countries can address their needs to the relevant organizations and become actively involved in the work of these organizations.

The role of the international organizations in development is not only to observe the dynamics in the Member Nations, but also to offer the ground for technical cooperation.

FAO's programme endeavours to carry out the best practices involving the relevant INGOs, which have the expertise in the field. Training, workshops, seminars and technical meetings have helped to build capacity in CEECs and converse the latest experience. International organizations have played a key role in supporting such activities and capacity building remains a key area for international cooperation.

A prospective view of animal recording

K Meyn[1], J.-C. Mocquot[2] & B. Wickham[3]

[1]Arbeitsgemeinschaft Deutscher Tierzüchter (ADT), Adenauerallee 174, D-53113, Bonn 1, Germany

[2]Institut de l'Élevage, Département Génétique, Identification et Contrôle des Performances,149, rue de Bercy, F-75595,Paris Cédex 12, France

[3]Irish Cattle Breeders Federation, Shinagh House, Bandon, Co. Cork, Ireland

Summary

A review was presented on the objectives, scope and current size of the field recording business of ICAR member organizations. In the second part of the paper the on-going trends in animal recording including recording for farm management purposes, quality assurance and breeding purposes are discussed. In the final section, an outlook is given into future recording systems with special reference to ICAR. This includes the scope of farm management aid and the recording of milk and meat producing animals for breeding purposes. Finally, the emerging structures of future farm animal recording organizations is discussed.

Objectives of animal recording

The intensification of livestock production systems over the last hundred years has been accompanied by a tremendous increase in performance recording in livestock. On the one hand, animals are being tested in central stations in order to measure their performance in a standardised environment, on the other hand, field records are taken and analysed to assist farmers in managing their herds more effectively and after correcting for environmental influences, to carry out more effective genetic selection programmes. The observed growth of the recording business and tremendous and sometimes still increasing productivity increases are proof of the justification of record keeping and analysis.

Improvement of performance and cost-effectiveness

Herd management recording

The growth of herd sizes in most developed countries and the availability of cheap electronic farm management aids have supported the development of performance recording on farms with the objective of better control of the input-output relationships in animal production enterprises. The livestock producer nowadays has effective management tools at his disposal which were not available before for more rational feeding schemes, appropriate mating and culling programmes and better health management.

Genetic selection

Increased data collection by farmers or recorders employed by neutral recording organizations and the possibilities to adjust for systematic environmental influences contribute effectively to genetic progress in production, reproduction, conformation, other performance traits and disease resistance.

Quality assurance programmes

A new, but important field of animal recording is the participation in quality assurance programmes, originating from the BSE crisis in Europe. Quality assurance is spreading to other parts of the world and from cattle to other meat producing livestock species. This results in a requirement for all meat producing animals to be individually identified and their movements to be traceable.

Benchmarking

Livestock productivity records from farms also provide important information for livestock producers to compare their operations and effectiveness with that of other producers. They can identify where their production process could be improved and be made more profitable. This information is important both for the individual farmer and for the extension worker.

Statistical utilisation

For the farming community and the community as a whole it is important to gather accurate statistics, both for reporting and planning purposes. General statistics are frequently not precise enough to fulfil these tasks. For example, the statistics given in Tables 1-9 are helpful in showing the different availability of milk and meat to the people living in different continents. They describe the contribution of the different animal species and continents to world meat and ruminant milk production as well as the varying productivity of animals in different countries. However, for project planning, farm management assistance or genetic evaluation, these data are not precise enough.

Scope

Ruminants

Organizations which have so far taken an interest in ICAR are mainly involved in the recording of milk and meat producing ruminants. Work is carried out by field, station and event recording, the latter for instance, gathering information in auction sales or slaughter houses. Methods of recording are in constant development including automatic farmer and recorder recording.

The backbone of the on-going recording activities in ICAR-related organizations lies in productivity recording of dairy cattle. Data are being collected for yield, nutritive value of the milk including butterfat, protein and solids, as well as the hygienic value, in particular, somatic cell count and the bacteriology of the milk.

Expansion to other milking animals such as buffaloes, sheep and goats has so far, been less successful.

The biological statistics are also collected to measure the reproductive and productive lives of the animals and the incidence of dystocia. Conformation is a further set of traits. In northern Europe, disease recording increases the number of traits that are being observed.

Other recording activities

Outside ICAR there are several other fields where recording of animals takes place, but these are either not intended for transparency, in particular in breeding companies for meat and eggs in poultry, for meat in pigs as well as for wool in sheep or recording activities for horses which are meant to be transparent in the same way as the recording of ruminants but which are carried out by special interest groups such as the World Breeders' Federation of Sport Horses (WBFSH) or by respective global organizations for race horses and trotters and have little or no common interest with ruminant livestock producers.

Current size of the field recording business

Although ICAR's membership has risen to over 40 countries, the proportion of the world's ruminant population being recorded by member organizations is relatively small. For example, about 22 million recorded dairy cows constitute less than ten percent of the world dairy cow population of the 184 countries listed by the Food and Agriculture Organization of the United Nations (FAO). In the other species it is impossible to estimate the proportion of recorded milking females because of lack of statistical data. In dairy cows more than half of the recorded cow population is kept within the European Union. Other large recorded populations are situated in the United States and Canada, New Zealand and Australia, Japan, Switzerland, Norway, the Czech Republic and Poland. The density of recording in Latin America, Asia and Africa is rather low.

While dairy recording of sheep and goats is carried out in 10 and 13 countries, respectively, the bulk of the numbers recorded comes from France.

The recording of meat producing ruminants is limited to cattle. About one million head are recorded in 21 countries including performance and progeny testing in stations, herd recording and the recording of auction sale and slaughter-house data.

Trends in animal recording

On-farm recording

The fact that since 1998 every calf born in the European Union has had to be earmarked and traced from birth to slaughter and that the data have to be recorded in central national databases, this has fundamentally increased the farm recording business in Europe. Cattle producers in Eastern European countries that aspire to join the European Union and beef exporting countries which want to sell into the largest consumer market on earth, have to follow equivalent rules in order to stay in the market. To cope with these additional tasks, farmers will need the support of competent service organizations.

With respect to on-farm recording for management purposes, growing farm sizes necessitate more record keeping. Increasing farm mechanisation and computerisation also permits easier record keeping and on-farm analysis of data and thus, in turn, may lead to less intensive linkages between the farm and the recording organization. Furthermore, the increasing cost consciousness of livestock producers will lead to the separation of simple recording for farm management purposes from the more complex recording for breeding purposes.

Quality assurance programmes

To existing animal recording organizations, quality assurance programmes constitute major opportunities and challenges, as other service organizations or organizations from other parts of the meat industry may want to exploit these new opportunities as well. One possibility is to integrate traditional recording and quality assurance recording into one database covering all the animals in a country, such as in Denmark. Another strategy would be to establish separate systems for each requirement as in the UK. A third opportunity would be to have a division of tasks into farm-related work for the existing regional recording organization and the database work at central level, such as in Germany. The main task for decision- makers is to envisage solutions for sustainable systems after initial government subsidies have been withdrawn.

Recording organizations

A distinction has to be made between those organizations recording for breeding purposes only and those organizations which also support farm management extension work.

In recording schemes which solely serve the breeding industry there is a trend to use more farmers' data and to carry out less frequent milk sampling in order to reduce recording costs, especially wages for the recording personnel. In addition, breeding organizations are interested in additional traits than just milk and milk constituents. In order to obtain these, there is an increasing variability of sources and accuracy of data. Agreements have to be found at the ICAR or INTERBULL level regarding the criteria to be met for data to be acceptable for national or international genetic evaluation.

In rendering services to the manufacturing industry and to farmers, the enormous costs of laboratory equipment and the diminishing State subsidies call for increasing size, complexity and throughput of the laboratories. This will be a driving force for the integration of smaller regional units or the separation of tasks into decentralised field work and centralised laboratory work.

Regarding cattle producer extension, the recording organizations must make up their minds whether to exploit the opportunity of backstopping services or whether they leave this to private software houses, farm management consultants or accounting firms. Their role in participating in the certification of quality management of livestock enterprises and their own accreditation and certification has to be decided.

Genetic evaluation

In dairy cattle, breeding organizations are expanding data collection for further traits, in order to guarantee sustainable selection programmes. This trend will continue because of the complex task to avoid antagonistic developments in the functional traits.

Against tradition, cross-breeding in cattle is likely to expand because at the producer level the problems of vitality of high-yielding cattle may be resolved more easily through cross-breeding in dairy cattle and commercial crossing of bulls with dairy cows than by selecting in pure-bred populations. Breeding organizations entering this field need to test the suitability of lines for cross-breeding before selling them to the farmers.

Judging from the trend of the last 15 years, the expansion of international genetic evaluation will continue. The major dairy cattle breeds are now integrated into INTERBULL, but international evaluation for beef cattle is still missing. This is a disadvantage especially for the breeds used in artificial insemination. There is a demand for global evaluations for a global semen market.

On the other hand, production conditions are not as similar worldwide as they are in the advanced dairy countries that are currently involved in genetic evaluation. There is a need for further studies on possible genotype / environment interactions answering the question whether there is a global bull or only a zonal one.

Outlook into future recording systems

Scope

Milk recording

Dairy cow recording will continue to be the mainstay of organized animal recording with decreasing cow numbers in the highly developed dairy countries because of yield increases under quota conditions.

There are still many areas in the temperate zone, the arid subtropics and the tropical highlands which would sustain production systems and dairy cattle breeding programmes of the bos taurus dairy breeds, e.g. any country of Eastern Europe and Central Asia, most countries of the Middle East and Northern Africa, South Africa and the tropical highlands in Africa, South America and Asia. Overall, the number of recorded cows should increase.

More important for the growing human population is the expansion of dairy cattle recording in developing countries situated in the hot and humid tropics and subtropics. Cattle extension and breeding schemes depend on reliable recording under existing production conditions. As high-yielding dairy cattle of the temperate zone are not always suitable under tropical and subtropical environmental, management and economic conditions, more efforts have to go into this field. Considering the time and effort it has taken to develop milk recording schemes in the highly developed dairy countries, it is high time to get moving in order to:

- find the technical answers to the appropriate genotypes in the different environments; and
- form the basis of relevant breeding programmes.

At the same time, recording programmes have to be enlarged for buffaloes so that meaningful selection programmes will be possible for this rapidly expanding animal species.

Regarding sheep and goats, simpler milk recording practices will have to be agreed upon to be of any assistance to herd management and selection programmes. Apart from recording schemes in France and some other Mediterranean countries, the unsatisfactory density of recording prohibits faster genetic progress. The fact that artificial insemination is the exception in sheep and goat breeding, reduces the possibilities of testing and multiplication of superior breeding stock.

Meat producing animals

The importance of quality assurance in future recording programmes has already been described. Provided that these data will be accessible for breeding programmes this would give a sound basis of breeding plans for cattle, buffaloes, sheep and goats. Otherwise, costly meat recording schemes will only be justifiable in breeding plans serving the AI industry, while selection for natural service animals will have to be simple and cheap.

Other recording

Whether ICAR member organizations will also find an entry into quality assurance programmes in pigs and poultry is an open question. For breeding purposes ICAR transparency is not required because of the competitive breeding structures. The recording of horses has too few linkages with the ICAR-related recording business so that there may be limited scope.

Structures

Farm recording

To stay in business, recording organizations must become more strongly involved in back-up services, for example, checking milk measuring equipment, supply of software, as well as providing data from a central database. Costly laboratory equipment must also be utilised more effectively, for instance in the field of animal health management, such as mastitis control and the eradication of diseases. Whether ICAR member organizations will be able to render the necessary back-up services or whether this will be taken over by software houses, farm consultants or accounting firms, is an open question.

Recording organizations

With public subsidies and the unfolding separation of recording schemes for farm management and genetic selection purposes, there will be structural changes in the recording organizations. The influence of the breeding industry in the recording business will probably be strengthened because governments will hand over their involvement increasingly to industry and the breeding section of the industry appears to be the strongest client. Various models of development, however, are likely because of different cultural backgrounds and present attitudes:

A) “farmer cooperative model”:
- the farmer cooperative closely integrates with the breeding industry, with almost total dominance in the recording business. Examples are Denmark, Holland and New Zealand;

B) “farmer extension model”:
- the farmer cooperative is organizationally separate from the breeding industry, but with strong linkages to specialised extension services, e.g. for dairy farmers. Examples of this are France and to some extent Germany;
- the “free market model”: this appears to be favoured in countries with dairy farms of a larger size, such as the UK, the USA and Australia.

No matter what the organizational structure will be, cost-saving mergers of adjacent organizations or the take-over of less efficient organizations by the more successful ones is likely. This development will not be stopped by political boundaries, especially in the case of smaller countries, but it will be strongly influenced by historical and cultural factors.

Whether global solutions in productivity recording will emerge or should be pursued is an open question. There appears to be a lesser need for globalisation in the recording business than in genetic evaluation and the quality control regarding the validity of results that national governments may exert throughout their recording organizations should not be underestimated.

Table 1. Share of the world's human population, milk production and ruminant meat production by continent.

	Human population	Milk production	Ruminant meat production
Africa	12.7	4.4	8.2
South America	5.7	8.3	14.0
Asia	60.7	27.4	25.6
Developing Continents	79.1	40.1	47.8
North/Central America	8.0	16.8	20.5
Europe	12.4	39.2	26.6
Oceania	0.5	3.9	5.1
Developed Continents	20.9	59.9	52.2
World	100.0	100.0	100.0

Source: Derived from FAO Production Yearbook, Vol. 52, 1998.

Table 2. World milk production by species and continent, 1998.

Old World					
Africa	3.9	3.3	21.3	19.1	4.4
Asia	17.8	96.3	57.6	46.6	27.4
Europe	44.7	0.4	18.4	33.9	39.2
Subtotal	66.4	100.0	97.3	99.6	71.0
New World					
NC America	19.5	-	1.2	-	16.8
South America	9.6	-	1.5	0.4	8.3
Oceania	4.5	-	-	-	3.9
Subtotal	33.6	-	2.7	0.4	29.0
% World milk production	85.7	10.5	2.3	1.5	100.0

Source: FAO Production Yearbook, Vol. 52, 1998.

Table 3. World ruminant meat production by species and continent, 1998.

Old World					
Africa	7.1	14.5	22.9	7.8	8.8
Asia	18.7	44.4	70.6	92.1	27.5
Europe	23.7	20.2	2.8	0.1	21.1
Subtotal	49.5	79.1	96.3	100.0	57.4
New World					
NC America	27.4	2.1	1.3	-	22.0
South America	18.4	3.4	2.1	-	15.1
Oceania	4.7	15.4	0.3	-	5.5
Subtotal	50.5	20.9	3.7	-	42.6
% World ruminant meat production	73.7	10.3	5.0	4.0	100.0

Source: FAO Production Yearbook, Vol. 52, 1998.

Table 4. Productivity of cattle in the major cattle producing countries, 1998.

Country	No. of cattle (Mio.)	Meat / head / year (kg)	Milk / head of cattle / year (kg)	Milk / milking cow / year (kg)
India	209	9	141	877
Brazil	161	32	134	810
USA	100	115	716	7 767
China	96	37	77	1 638
Argentina	55	42	179	3 900
Sudan	35	7	85	480
Russia	32	69	1 009	2 286
Ethiopia	30	8	25	209
Colombia	28	24	191	982
Mexico	26	62	331	1 287

Source: FAO Production Yearbook, Vol. 52, 1998.

Table 5. Range of productivity of cattle by country, 1998.

	Highest		Lowest	
Meat per head in herd (kg)	Italy	122	Sudan	7
Milk per head in herd (kg)	Israel	3.027	Benin	14
Milk per milking cow (kg)	Israel	8.615	Ghana	130

Source: FAO Production Yearbook, Vol. 52, 1998.

Table 6. Productivity of buffaloes of the major buffalo producing countries in 1998.

	No. of buffaloes (Mio.)	Meat / head / year (kg)	Milk / head / year (kg)
India	91.8	15	386
Pakistan	21.2	28	776
China	20.8	12	110
Thailand	4.0	17	-
Nepal	3.4	34	214
Egypt	3.2	73	600
Indonesia	3.1	17	-
Philippines	3.0	17	6
Vietnam	3.0	36	11
Myanmar	2.3	9	45

Source: FAO Production Yearbook, Vol. 52, 1998.

Table 7. Range of productivity of buffaloes by country in 1998.

	Highest		Lowest	
Milk per head in herd (kg)	Bulgaria	1 091	Thailand	0
Meat per head in herd (kg)	Egypt	73	Myanmar	9

Table 8. Productivity of sheep in the major sheep producing countries in 1998.

Country	No. of sheep (Mio.)	Meat / head / year (kg)	Milk / head / year (kg)	Wool, greasy (kg / head)
Australia	120	5.7	-	7.8
China	118	8.6	10	2.4
India	56	3.8	-	0.8
Iran	53	5.2	9	1.2
New Zealand	48	11.6	-	14.3
UK	44	8.5	-	1.5
Sudan	42	3.4	11	0.7
Pakistan	32	10.3	2	1.8
Turkey	30	9.8	27	1.5
South Africa	30	4.0	-	1.8
Spain	25	9.1	12	1.2

Source: FAO Production Yearbook, Vol. 52, 1998.

Table 9. Productivity of goats in the major goat producing countries in 1998.

Country	No. of goats (Mio.)	Meat / head / year (kg)	Milk / head / year (kg)
China	138	8.6	2
India	121	3.8	26
Pakistan	49	10.3	17
Sudan	37	3.4	31
Bangladesh	34	3.7	40
Iran	27	5.2	15
Nigeria	25	2.3	-
Ethiopia	17	3.7	6
Brazil	13	4.1	11
Somalia	13	2.9	92

Source: FAO Production Yearbook, Vol. 52, 1998.

The current status and outlook of milk production in Central and Eastern European countries (CEECs) and the European Union (EU)

E. Erjavec[1], F. Habe[1] & M. Zjalic[2]

[1]University of Ljubljana, Biotechnical Faculty, Zootechnical Department,
Groblje 3, 1230 Domzale, Slovenia

[2] European Association for Animal Production (EAAP),
Via Nomentana 135, 00162 Rome, Italy

Summary

Milk market and agricultural policy measures in Central and Eastern European countries (CEECs) in comparison to the European Union (EU) are presented with regard to some key questions of EU enlargement in this field. The production and processing of milk in CEECs do not match the European standards referring to technology, economy of scale, hygiene, animal welfare and environmental criteria. The agricultural policy of CEECs can only partly be compared to the common market policy. The support level is high although the producer prices are 30–40 percent lower than in the EU. Nevertheless, no immediate approach to the European price level and increased milk production can be expected after the enlargement. Milk production and processing in CEECs are not competitive with the milk industry in the EU that will even obtain new markets after enlargement. Accession negotiations for milk were started in July 2000 for the first group of CEEC candidates after the negotiating positions were settled. The negotiations will concern quotas for which no significant deviations from statistical production in the referred period and implementation of required mechanisms for common market policy are expected. Quick and efficient modernisation of public administration and competitive milk production and processing are essential for accession. Radical changes are expected to fail these objectives and difficult times are foreseen for milk production in CEECs in the transitional period until integration into the EU is anticipated, hence, the integration could not coincide with the date of political enlargement.

***Key words**: milk production, EU, enlargement, common agricultural policy.*

Introduction

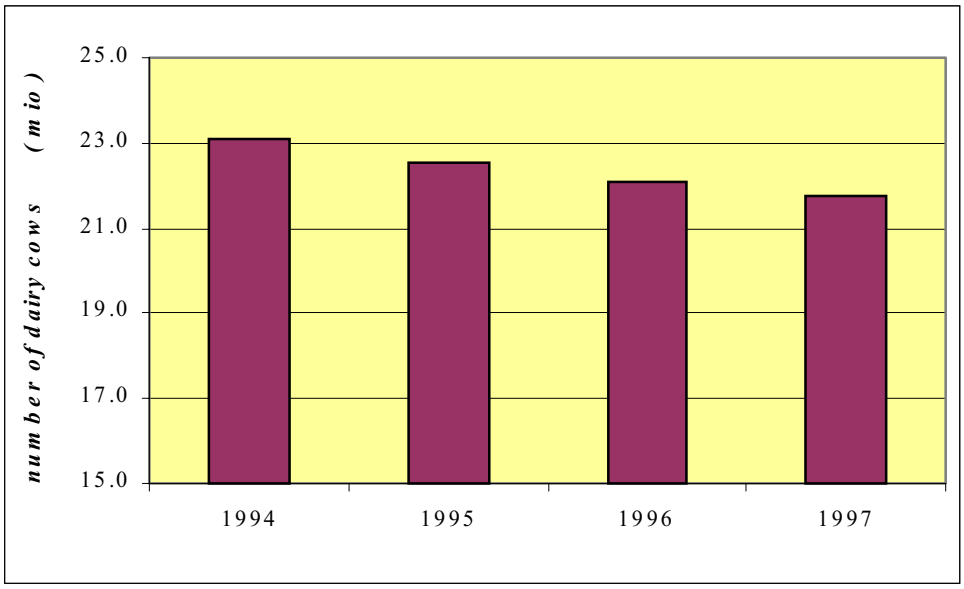
The enlargement of the EU towards Central and Eastern Europe (CEE) has reached the final phase. Two groups of CEE candidate countries have been formed. The Luxembourg Group of countries (CEEC I) that started the negotiations in 1998 consists of the Czech Republic, Estonia, Hungary, Poland and Slovenia while the Helsinki Group (CEEC II) consists of the countries that started negotiations in 1999. They are Bulgaria, Latvia, Lithuania, Romania and Slovakia. Cyprus belongs to the first group and Malta to the second one. At the end of 1999 the first group countries forwarded the negotiating positions for agriculture. In June 2000 the EU with its common position answered the negotiating positions (EU Common Positions, Agra Focus June 2000). Most of the other negotiating demands of accession has already been settled. Agriculture is very important for CEECs and the EU and will therefore continue to be discussed until the end of negotiations. It determines money and power positions in the future EU. Agriculture in the countries of the present members of the EU would not like to be stricken by enlargement while the candidate countries would like to benefit from the enormous agricultural budget, now amounting to EUR 41 million.

Milk production represents one of the crucial sectors within agriculture. The European common market organization differs a lot from the market regulation in CEECs; the production value in both cases shows the importance of the markets that influence the political movements as well. Milk production and market regulations should be studied during the accession process. After the accession, changes will have some consequences for milk producers in CEECs as well as in the EU.

The economic structure and policy environment in milk markets in CEECs and the EU are of great interest. What could be the impact of the enlargement on both sides? What are the crucial negotiating problems in this area? Therefore, the available literature, especially publications of international organizations (European Commission, OECD, FAO, EUROSTAT) and literature concerning the present agricultural policy (periodicals Agra-Europe and Agra-Focus) has been studied and the matter has been discussed with some representatives in the accession negotiations on both sides. The article consists of four parts: the description of milk and the milk product market is followed by the comparison of agricultural policy and its impacts on the milk market. The negotiation process and crucial negotiating positions are also discussed. In conclusion, the estimation of further events and consequences of accession are stated.

Dairy inventories in EU member states have been diminishing for two decades. The total number of cows has reached 21 million (Figure 1), due to production restrictions in the EU (establishment of production quotas in 1984), stagnated demand and increased milk production of cows. The intensive specialisation in the production of dairy cows and beef with suckler cows is gradually replacing the production based on dual-purpose cattle. Farm size has been increasing all the time.

Figure 1. Dairy inventories in EU (number of dairy cows, mio. head).

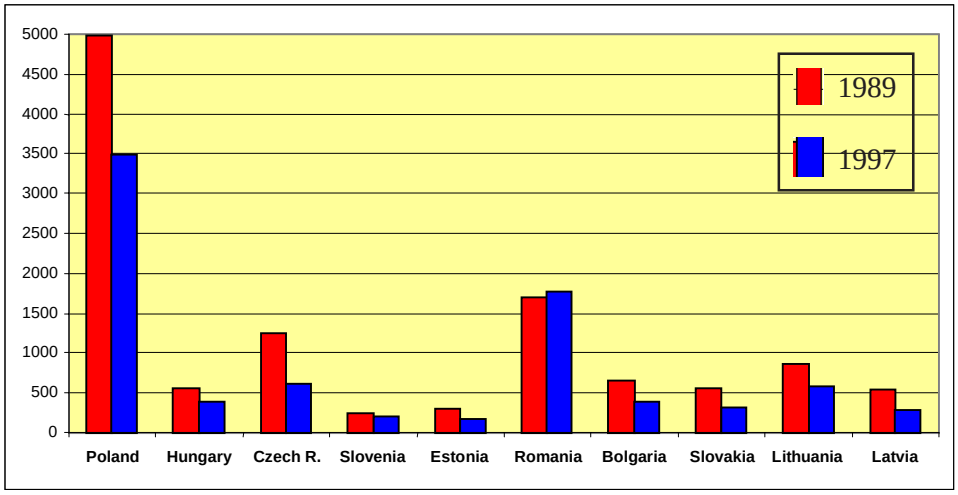


Source: Eurostat (1998).

In the period of social changes, dairy inventories diminished in all CEECs. The only exception is Romania that maintains the inventory. Big farms that were known in all the countries started to eliminate the production and the process of restructuring began. The milk production as well as all other branches of economy encountered structural, ownership and market changes. Dairy inventories before and after the transition are shown in Figure 2.

Inventories in the EU and CEECs cannot be compared. The milk production in CEECs depends primarily on dual-purpose cattle races. Statistical data includes dairy cows and other animals with very low milk production. Specialisation of milk and beef production has been delayed. The pace of changes is also determined by the longer reproduction cycle of cows. If all accession countries are integrated, the dairy inventories in Europe will be increased by 4 to 5 million animals, which means 25 percent of production. More than half of the dairy cows will be contributed by Poland, still being

Figure 2. Dairy inventories in CEEC in 1989 and 1997 (in '000 heads).



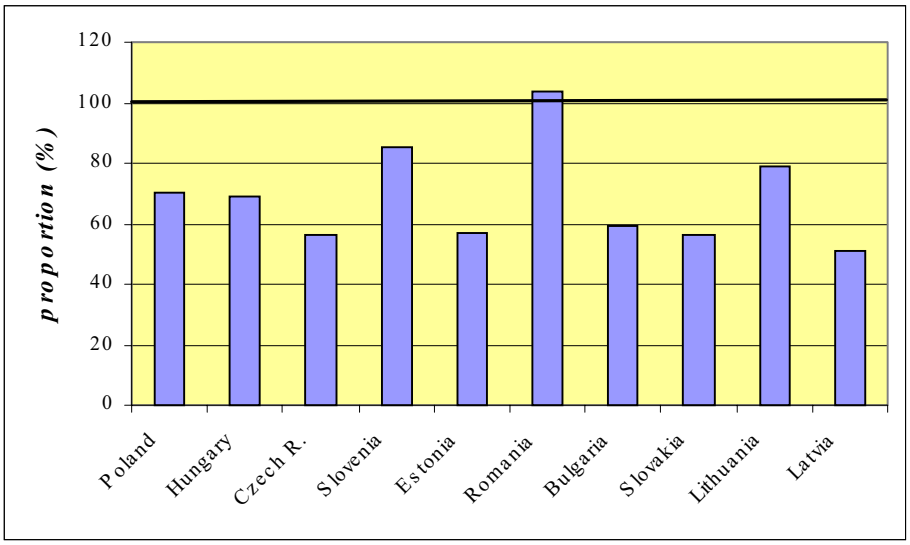
Source: OECD (2000).

an agriculture-oriented country (Figure 3). The same could be said for Romania. However, it is evident that it will not become a member in the first round.

Milk yields

Technologies and production intensity of breeding has significantly changed in the EU. Selections to higher milk yield, nutritional and milking changes and new cowsheds have contributed to higher productivity of

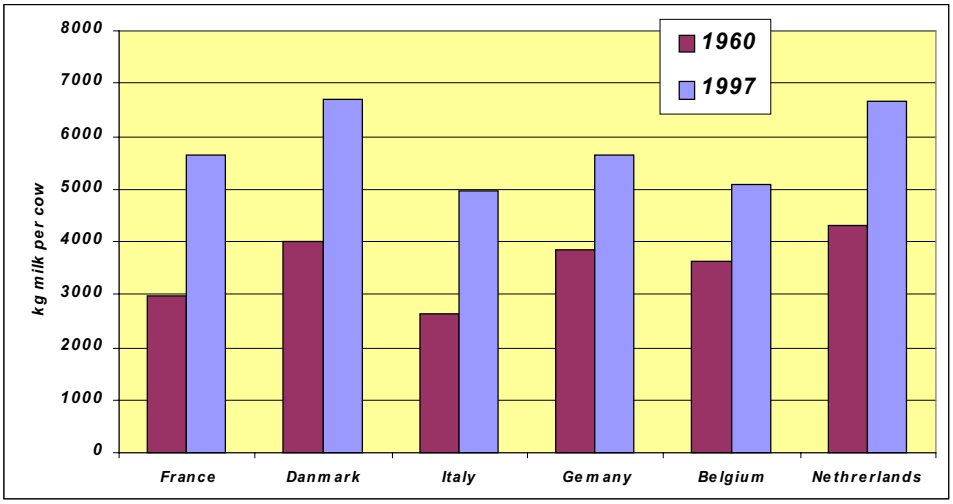
Figure 3. Dairy inventories in CEEC in 1997 (1989=100).



Source: OECD (2000).

work and capital. Economic optimum of production can only be met by higher milk yields, to which also average milk yields are approaching. In the last forty years they increased from 50 to 100 percent and reached 7 000 kg milk per cow per year in some countries and regions (Figure 4).

Figure 4. Milk yields in EU.



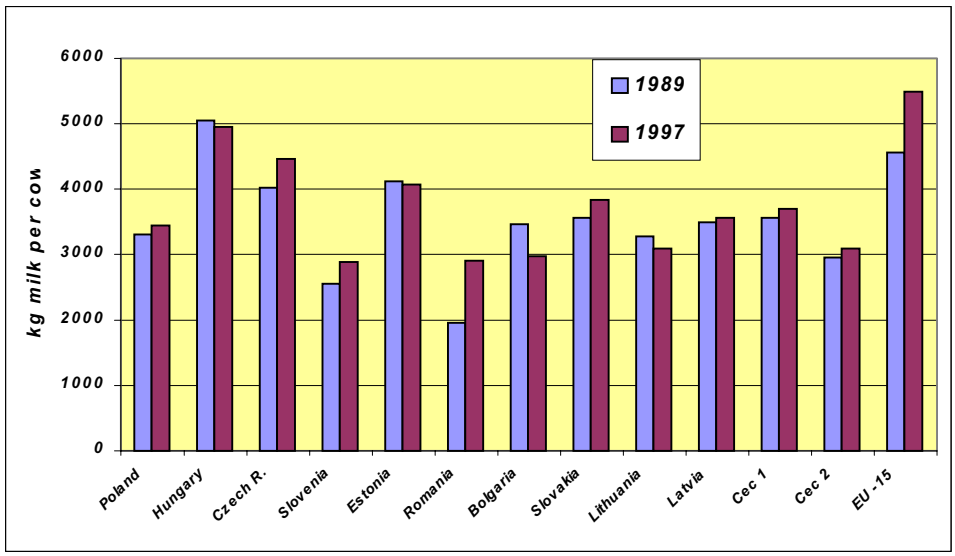
Source: Eurostat (1998).

In CEECs the milk yields are 30 to 50 percent lower than in the EU. The average milk yields in the EU are achieved only in Hungary followed by the Czech Republic. In all other CEECs the average milk yields can be compared with EU milk yields from the sixties. Significant production capacities of milk yields exist and can be obtained by specialisation and lower dairy inventory. It is related to the lower number of small farms in countries from the first group of enlargement (Poland), therefore, the restructuring of milk yields is not only the question of competitiveness of the candidates but also a political question. Structural changes will not be acquainted over night; the structure will not be able to be compared to the yield structure in the EU for at least two decades.

Milk production and consumption

The EU produces about 115 million tons of milk a year. The production has slightly diminished due to lower dairy inventory despite higher milk production. More than 10 million tons are produced in Germany followed by France, Great Britain, Italy and The Netherlands, the latter being a big producer from the point of view of geographic size and population. The intensive production is typical also for Denmark and Ireland. They produced much more milk than they consume. Data on self-efficiency (percentage of domestic production in domestic usage) for the whole EU are not available. Regarding the level of self-sufficiency for some milk

Figure 5. Milk yields in CEECs.

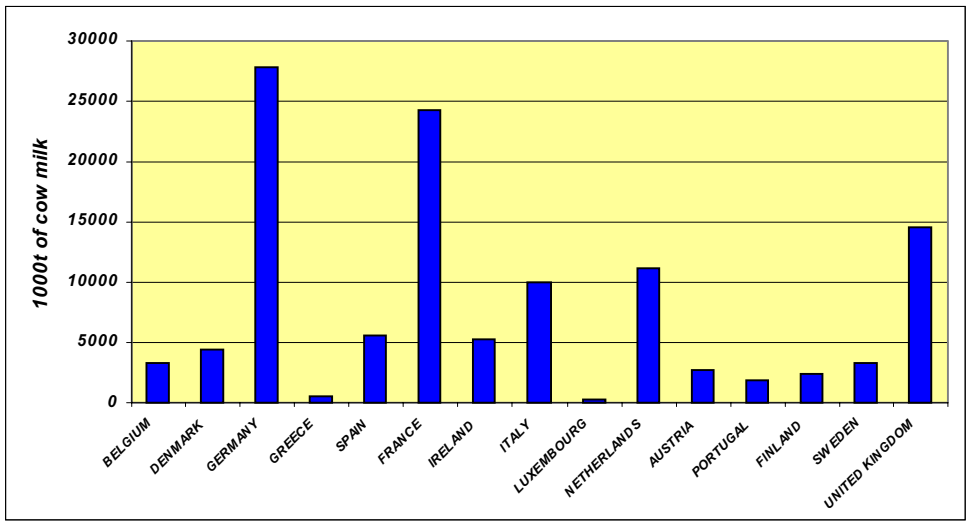


Source: OECD (2000).

products (milk powder, butter, cheese, fresh milk) and highly developed intervention measures that balance the market, we can speak about market satiety where sharp competitiveness rules.

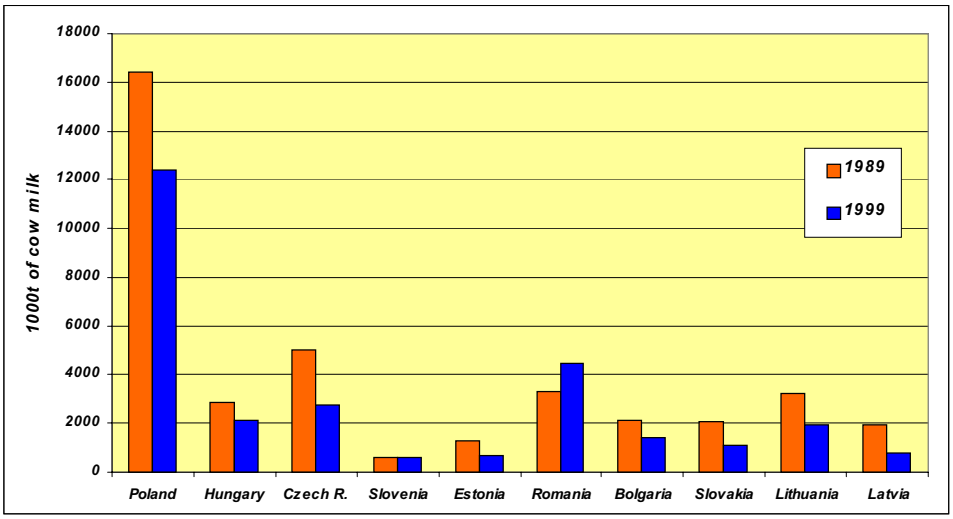
Milk production stagnated in CEECs after the beginning of transition. After 1996 production increased in most of the countries. Slovenia is an exception because milk production was stable throughout this period. In Romania milk production has been increasing all the time. The outlook for milk

Figures 6. Milk production in EU,1999.



Source: Eurostat (1998).

Figures 7. Milk production in CEECs.



Source: OECD (2000).

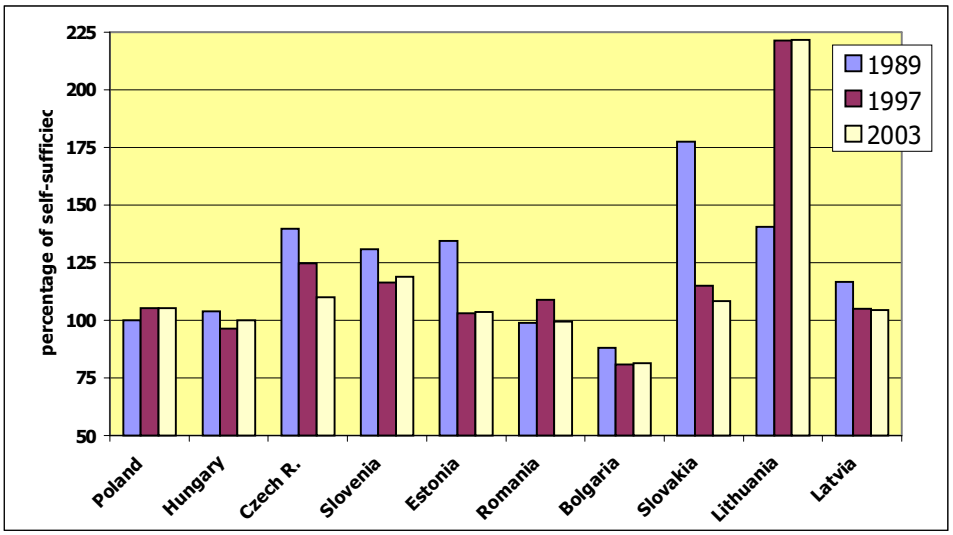
production until 2003, prepared by the EU (European Commission, 1998), displays an increase in milk production in most CEE countries but is still below the level at the beginning of transition.

Milk consumption in CEECs follows milk production, except in Slovenia, where the consumption at the beginning of the period increased more than production. The consumption of fresh milk per inhabitant is the lowest in Slovenia. Similar low consumption is noticed in Hungary but the consumption in the studied period fell from a higher level, while in Slovenia the consumption per inhabitant increased. It is expected that the consumption per inhabitant will increase in most countries until 2003 (European Commission, 1998).

The highest amounts of milk are exported by the Czech Republic followed by Poland. Slovenia is a minor net exporter. All countries are near total self-sufficiency with a slight variation in the year of production. All countries except Hungary and Romania will probably export surpluses in the future.

After accession, the milk production in CEECs will have to compete with sated EU markets. It cannot be expected that CEECs can benefit from their advantages shown in some studies (lower expenses for work and land). It can even be expected that the milk industry in the EU will obtain new markets in CEECs so that the level of domestic production will be endangered.

Figure 8. Self-sufficiency in milk production in CEECs (%).



Source: European Commission (1998).

Milk market policy comparison

Common market organization for milk and milk products in the EU

Common market organization for milk and milk products was enforced when the common market was established at the end of the sixties. A model of high price policy was introduced over a very diverse system of various measurements in the foreign and domestic markets. The EU (European Economic Community at that time) raised the price level with high foreign trade protection up to 50 percent more than could have been achieved on the free market. High prices and stable levels were ensured by various intervention measures in the domestic market and by export subsidies that replaced the price differences at world level. Favourable prices and technological development enforced the production growth. Milk surpluses (butter and skimmed milk powder) increased as did expenses for interventions and subsidies. Agricultural ministers of the EU did not want to diminish prices so that the expenses became too high to finance the common agricultural policy. The budget problems required some changes. The problems were solved by administrative determination of allowed amounts of milk per Member State and in general also per producer (each additional amount of milk is additionally taxed). The financial problems of agricultural policy were thus solved and agricultural producers were ensured of the adequate price level. The presentation of common market regulations for milk and milk products follows (Regulations 1255/99 and 1256/99, CAP Monitor, 2000).

A common market organization was determined again with Agenda 2000 (Regulation 1255/99 on common market organization for milk and milk products and Regulation 1256/99, establishing an additional levy in the

milk and milk products sector for the case of quota violations). Market organization for milk concerns production of fresh milk, milk powder, skimmed milk powder (SMP), butter, cheese, curd and other milk products. The base for most market price measures for milk and milk products is institutional prices that are determined by the Council of Agricultural Ministers every year. The target price is determined for milk that contains 3.7 percent milk fat on delivery to the dairy. The price enables a politically determined income level for milk producers. The intervention price is the lowest purchase price at which the intervention agencies should purchase all offered amounts of butter and SMP that agree with quality standards.

Foreign trade regime

Before the GATT Agreement was signed in 1994, the import of milk products to the EU was regulated by variable import levies. The Council of Ministers determined the lowest input prices for twelve milk products that were based on target milk price. The import levies depend on the conditions of world markets and represented the difference between the (lower) world price and the target price in the EU. The regime of variable import levies according to the GATT Agreement was changed, therefore, fixed import tariffs were introduced. They are used for 116 milk products in the form of fixed custom tariffs and ad valorem special import tariffs. Import protection measures were diminished by 36 percent by the end of the implementation period (1 January 2000). Besides diminished import tariffs the GATT Agreement provides import quotas at a lower rate because of obligatory market opening. By 2000 the import should reach 5 percent of domestic consumption.

In order to sell high price products from the EU on the world markets, the exporters from the EU receive export refunds to diminish the difference in prices in the EU and world markets. In the case of shortage of milk products and higher world prices, export can be limited. According to the GATT Agreement the EU should diminish the export subsidies by 21 percent by the year 2000/2001.

Domestic market measures

The systems of intervention purchase were introduced in order to maintain high producer prices and to moderate seasonal and cyclic price oscillations on agricultural markets that worsened the income conditions of producers. The intervention agencies in the EU should purchase all offered surpluses of milk and SMP at pre-determined intervention prices because the mentioned products are the most important for producer price formation. A similar effect is achieved by subsidies to the private storage of butter, SMP and some kinds of cheese.

The supplies from intervention purchase and expenses of supply sell resulted in restriction measures. Intervention purchases are seasonal, the purchase can be postponed when the supplies are too high, while the butter

is purchased when the market price achieves only 92 percent of the intervention price in the two week period. Similar limits are in use for subsidies to private storage.

The supplies of intervention agencies can be placed on the market so that conventional marketing is not disturbed and price relations in the inside markets are not disrupted, for example, as assistance in food, export with export subsidies, sell to non-profit organizations or to food processing industry or for animal nutrition.

The production of casein and caseinates from SMP and the use of SMP in animal nutrition are very important. Stimulation of fresh milk consumption in schools within the project "school milk" is subsided.

Production quotas and direct payments

According to the system of production quotas introduced in 1984, each member country received a quota, the allowed level of milk production on the basis of milk produced in 1981 increased by one percent. National quotas were divided among the breeders that responded to the above criteria. The system of milk quotas was the most effective method of milk surplus solution even though several administrative problems were encountered on its implementation. Nevertheless, the consequences for the income position of breeders were favourable.

The breeder that exceeds the individual referral quota has to pay an additional levy at 115 percent of the target price for all milk above the given quota. This taxation is collected directly from the producers or from dairies. Taxations from milk quotas are devoted to restructuring of milk production. The mechanism has been modified several times in order to follow the market tendencies. In 1986 the system of taxation of increased content of milk fat in the delivered milk was introduced due to market surplus of butter. Individual quotas were determined regarding the content of milk fat and not only the amount of produced milk. The milk quota was diminished several times: 1987/88 by 6 percent, 1987/88 by 2.5 percent and in 1991/92 by 2 percent.

According to the Agenda 2000 Regulation, the system of milk quotas will be in use until 31 March 2008, but will be estimated again in 2003. Milk quotas will increase by 2.41 percent in this period, of which 1.18 percent represents specific distribution to four member states in one region in the period 2000 to 2002 (in two steps), 1.23 percent of the linear increase will be given to the other member states in the period 2005 to 2007.

According to the Agenda 2000, the reform of market for milk and milk products will be started regarding the reform in beef and wheat markets. Partial liberalisation of prices will follow when direct payments are introduced. Target price for milk, intervention prices for butter and SMP will be diminished by 15 percent in three equal steps beginning in 2005.

The price fall will be compensated by direct payments (60 percent of the price fall will be covered). The amount of direct payment in 2007 will be EUR 25 per ton of milk quota, the basic payment being EUR 17.24. Member states can pay the difference as an additional payment for a ton of quota or payment per ha of permanent meadows. Direct payments will be determined on the basis of milk quotas from the years 1999-2000.

Policy mechanisms in the CEECs' milk sector

Agricultural policy in CEECs significantly differs from the EU policy and agricultural policy differs among the members of CEE countries. Nevertheless, some similarities can be found. Some measures are similar but the mode and efficiency of measures differ. Some points are common. Trade protection is relatively high and represents the most important measure. According to the WTO agreement some allowed protection rates are higher than in the EU (Table 1), but the applied rate of foreign trade protection is significantly lower than in the EU. Milk market protection in Slovenia is very similar to that in the EU.

Table 1. Trade policy in CEECs - bound tariffs, 2000 (EU=100).

	Butter	Skimmed milk powder	Cheese
Poland	122	154	184
Hungary	75	73	77
Czech Republic	50	53	10
Slovenia	104	100	142
Estonia	0	0	0
Romania	147	354	310
Bulgaria	44		110
Slovakia	50	33	10

Source: European Commission (1998).

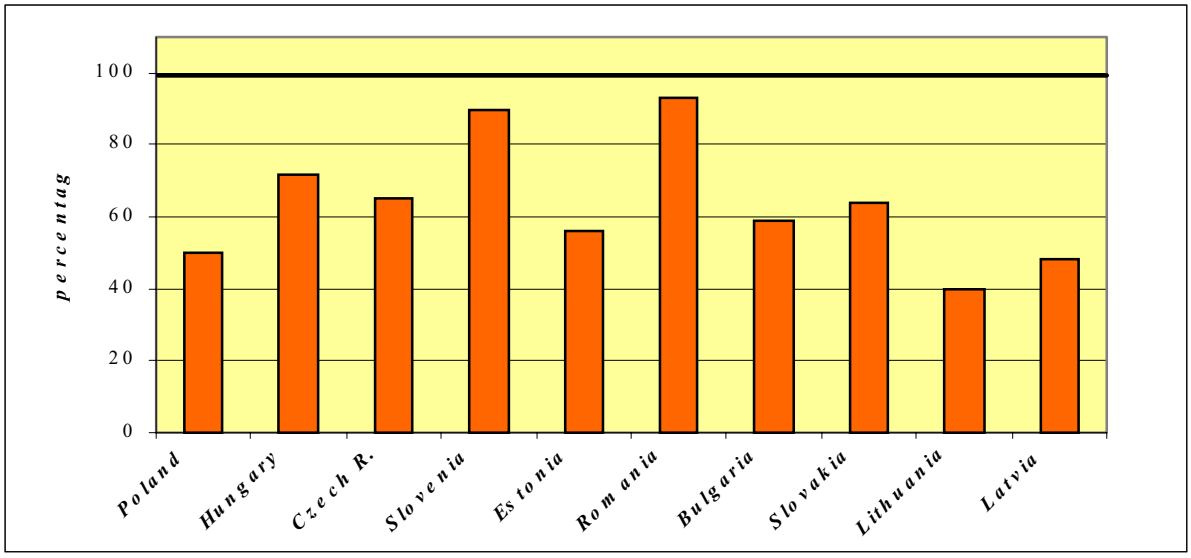
In comparison with the other agricultural markets, in the milk sector the export subsidies represent an important measure. All export candidate countries use it temporarily. Some countries use intervention measures in the domestic market but the intensity and efficiency of the measures is much lower than in the EU. The measures are defined on the basis of different systems of institutional prices (fixed, guarantees, minimum, indicative) to enable the countries to regulate the prices for agricultural producers. Some countries regulate the markets with administration of producer prices on farm-gate and even some milk products, which means the violation of market economy.

After the beginning of the accession process some countries introduced similar measures to those of the common market organization for milk and milk products. The Czech Republic and Poland have introduced quotas, direct payments for dairy cows and different forms of intervention subsidies.

Milk price and producer support

Producer prices in CEECs gradually approach the price level in the EU. Milk prices differ a lot (Figure 9). On average they achieve 50 to 60 percent of average prices in the EU. In Slovenia and Romania the producer prices were closest to EU prices. In 1997 the Polish farmers, who are as many as all the farmers in the other candidate countries together, had the milk paid at a price that did not reach half of the producer price in the EU.

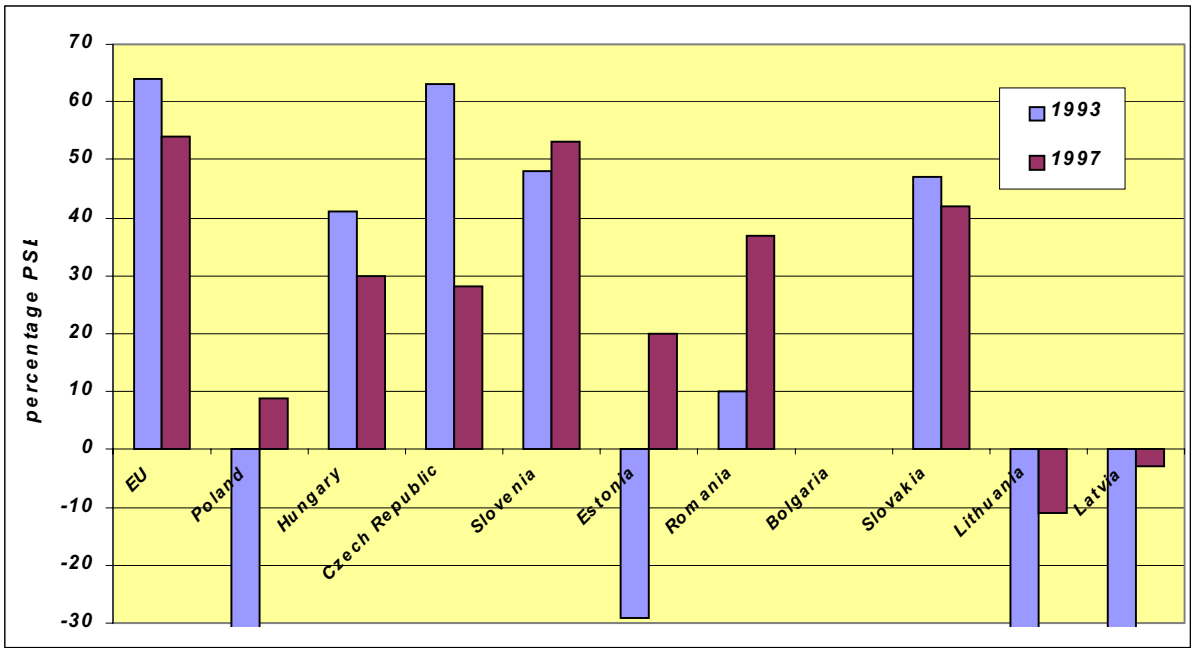
Figure 9. Producer price of milk, 1997 (EU=100).



Source: European Commission (1998).

The producer price explains only a part of the difference in producer protection. Farmers can also gain the income from public budget resources, therefore, the differences of producer protection should also be considered from the point of view of differences in public budget for some products. OECD uses special Producer Support Estimate (PSE). Generally speaking, it is a sum of market-price support that expresses the difference in price between the domestic and world level, evaluated amount of production and budget subsidies for production. If such subsidies are expressed as a percentage of total value of production at current prices, the PSE percentage is obtained, which shows the relative differences in protection in some countries.

Figure 10. Support level (% PSE) for milk.



Source: OECD (2000).

In CEECs the level of support is different in various markets. Generally the level of support for some products has been increased in CEECs despite the lower level of support in CEECs in comparison to the EU. Slovenia is the only exception. On the milk market the support level has been increased in all countries, it being much lower in CEECs than in the EU. In Slovenia the support level is the same as in the EU followed by Slovakia, Hungary and the Czech Republic. In Poland the support level has been increased, however, it is still quite low. The Baltic countries except Estonia still have negative support for milk production, which means that milk producers are taxed and will have better prices if the State withdraws from the market.

The comparison of the price and support levels enables the estimation of accession effects even though it is speculative and unworthy. It is expected that producer prices in candidate countries will sooner or later approach the prices in the EU after integration. Lower buying power and competitiveness of the milk industry will not allow the rapid diminishing of price differences. Milk producers from CEECs except Slovenia will achieve higher prices. Low prices will not stimulate the production yields but differences between regions and dairies will increase. Price formation, especially the increase or even production omitting, is the competitive ability of local dairies. Those dairies that respond to hygienic standards of the EU and have first-rate products that will compete with mass production in the EU and agree with economy of scale, will have better possibilities to

achieve higher producer prices, but hygienic standards and animal welfare requirements should be encountered. The modernisation of the whole chain of milk production is the crucial point of existence and development in certain regions. The present circumstances in the milk industry point more to the loser than to the winner approach.

EU Enlargement

In July 2000 the agricultural negotiations were started at the negotiation conference between the EU and some candidates of the CEEC I Group. The candidate countries agreed with the legal system of the EU (acquis communautaire), nevertheless, several requirements for partial or permanent derogation from the EU legal system were passed. All candidates except Slovenia, gave their requested milk quotas in numbers. The EU passed a special document, common position, stating that quota and direct payments will be negotiated later, but more precise data on markets for the period from 1995 to 1999 were demanded, this period could be the referral period for determination of quotas.

Will CAP be reformed before the enlargement?

Agriculture is a very important feature in the negotiations. There are so many unknowns that neither the negotiation results nor the end of negotiations can be predicted. The EU is afraid of the CEECs' production boost and the fear that limited financial sources have to be shared out to the millions of farmers from CEECs. Besides agriculture, special attention is dedicated to free movement of persons. Redundant farm workers will put pressure on the EU labour market after being confronted with common market competition. The importance of this problem is especially stressed in Austria and Germany particularly before elections. The success of the negotiation process in agriculture depends on the following facts.

1. The date of enlargement and number of first accepted countries should be known. The EU will finance the enlargement but the resources are not adequate for equal integration of all candidates. If the candidates do not receive all payments, the EU cannot limit the production. Nevertheless, the financial resources for enlargement exist. If enlargement is postponed (until 2005) or the number of first accepted countries diminishes, some candidates will be equally entitled to integration.

2. A new round of negotiations within the WTO is in progress. It is expected that agricultural policies of developed countries will have to liberalise foreign trade. The target of the negotiations will be the EU that will find some trade balance difficulties according to the European Commission (milk and beef). The enlargement and WTO will force some modification in the EU agricultural policy but changes are yet to be discussed. The discussion on changes will probably be started in the second half of 2001 when the final phase of negotiations can also be expected.

Some directions of the reform can be predicted. If we connect reform with the essential financial resources needed for the enlargement, then the EU can assist the enlargement in the field of agriculture by:

- extra financial resources; this is not likely owing to egoism and absence of visionary of leaders of member states. The European taxpayers will not agree with extra taxes and the beneficiaries will want some privileges;

- reform of agricultural policy, diminishing financial resources (explanation will follow);

- discrimination of candidates in the form of a shorter or longer transitional period for direct payments and other measures that are understood as absence of payments from Brussels to candidates. It means that the candidate country has to ensure the payments alone from their own budget.

No revolutionary changes in the policy of the EU can be expected. Already used or predicted solutions will appear again. The most unfavourable but the most wished solution from the side of the WTO is the "digressive decrease of direct payments". The member states, which are the net receivers of the CAP resources, like France, are not in favour of it because they will lose an important part of the FEOGA resources. The President, Jacques Chirac, the former Minister for Agriculture, is aware of the importance of rural electors in the majority system and therefore, no changes can be expected before the elections in 2001.

The proposal of the re-nationalisation of CAP is always present. In this case, a part of market price measures will be paid by member states themselves (at present they are financed by FEOGA). France does not agree on the same reasons. Hence, the latest Council solutions (School milk …, Agra Focus April 2000) point in this direction. Member states will finance the project "School Milk" in the future. The Council should find solutions because of strict budget limits.

CAP measures are unjust from the social point of view. Eighty percent of money is given to 20 percent of the largest farmers. Some large producers that own large and successful agricultural enterprises receive cheques for a few hundred thousand EURO every year because of the linear increase of resources. The Commission would try to propose modulation, which means that large farmers will receive less support. Agenda 2000 introduced such solutions and the saved money can be used for structural programmes. Further changes can be expected.

The EU can save some resources with strict implementation criteria especially for sustainable production. Some changes have already been accepted. The European taxpayers will agree to high expenses used for

sustainable production. It is evident that all solutions are very technical. Only the combination of the above-mentioned proposals can be expected. More developed members will benefit, while each change means deprivation for the candidates. A Europe of two speeds has already been developing, especially in the field of agriculture.

Accession issues for the milk sector

Milk production is one of the key negotiation topics in agriculture. The main reasons are high levels and regulation differences as well as diverse production and market structure in the EU and CEECs. Adjustment process and accession negotiations can be allocated as follows:

- determination of milk quotas and direct payments;
- upgrading of implementation capacity;
- harmonisation of hygiene, animal welfare and environmental standards;
- competitiveness of the dairy industry.

Determination of milk quotas is the main negotiation problem in the field of milk and probably in the whole negotiation process. The CEEC I Group required in their negotiation positions the quotas that exceeded the production level proposed by the EU for the period 1995-2000. We should take into account that statistical data are not comparable because some statistical data also include milk used for nutrition of calves, so that real market production (dairy purchase and sale at home) can be much lower than statistical data show. The present enlargement and Common Agricultural Policy show that higher amounts than determined in the referred period cannot be expected. Candidates should not hope too much. There will be a problem on how to divide the quotas among individual breeders, which results in structural change delays when the quotas become available on the market.

Table 2. Milk quotas (mio. t).

	Production 1995-99	Negotiation position
Poland	12.08	13.18
Hungary	1.98	2.80
Czech Republic	2.85	3.10
Slovenia	0.60	*
Estonia	0.72	1.20
Total	14.07	21.08

Source: Agra-Focus (April 2000)
* no position.

Besides quotas, there is the problem of upgrading the implementation capacity for the common market organization. The inflows from Brussels depend widely on the harmonised and demanding implementation capacity. An efficient and demanding administrative "machine" has to be developed. The most challenging part will be the formation of a paying agency that does intervention purchases, passes export certificates, pays export subsidies and accomplishes all other measures connected with market regulations. The agencies will employ at least a hundred qualified staff and even more in the bigger countries. Effective administration is not an advantage of CEECs; therefore, difficulties can be expected at accession. The EU, having strict rules, can prolong the accession period because it would be problematic to point out that candidates are not ready to take over the legal system. The question of identification of animals should be discussed too. Cattle should be marked according to a special administrative system of control. Not even all member states are familiar with these procedures. New intervention measures offer additional possibilities for the agro-food industry. The economic results can be optimised using various intervention measures. Breeders that increase the use of skimmed milk powder for nutrition of calves will be supported. The upgrading of implementation capacity will be a nightmare for the candidates. They should take over and develop activities that are often illogical.

Taking over of EU standards for food hygiene, animal welfare and environmental protection will be very pretentious. The EU requirements are quite strict especially for hygiene in dairies. Only a low percentage of CEECs' dairies fulfil the requirements. Some CEECs have requested transitional periods in this field. The sanitary control is problematic. Development of an efficient sanitary control at all levels is of vital importance. An efficient veterinary system and introduction of the HACCP control system in the dairy establishments is the precondition for any activities in the common market. Industries as well as administration in CEECs are not yet aware of the problem that could have severe consequences for competitiveness after accession. Dairies should decide whether they sell their products to the local market under less strict conditions or invest in order to work in normal economic conditions. Capital investments and human resources are concerned. Adjustment to taking over the standards will be a long-term process that requires a lot of energy and changes in enterprise structure. Fresh milk should be standardised too. Candidate countries have diverse categories of milk fat contents than the EU. Most candidates have requested transitional periods in this field, for example, Sweden and Finland. In this field more successful negotiations are expected if argumentation is adequate. The requirements might start the changes of the senseless basic regulations in the EU.

Although the problem of quotas and training of administration to take over the legal system seem very pretentious and crucial, the successful accession in milk production in CEECs depends primarily on

competitiveness of the dairy industry. An alienated and locally oriented dairy industry will encounter several problems in the global conditions of the common market, which consists of more than 400 million consumers that have high price and quality requirements. Value-added per employee and different profit indicators show poor performance of dairies in CEECs. Several studies argued the problem of economy of scale and staff and management traits of managers. Foreign direct investments to dairies are not as frequent as in other sectors of the food processing industry; hence the conditions after accession will be severe. Threats for dairies will come after accession from the retail sector. It has been restructured very quickly. Capital from the EU has been brought into effect and domestic suppliers were threatened that foreign suppliers will be pushed forward. The dairy industry in CEECs could hardly maintain the share in the local market because of the present protection, but negative consequences for domestic milk production is predicted. A part of milk will still be produced in the framework of national economies in CEECs. It is typical for CEEC markets that consumers are used to local products and delivery costs are low, so that products cannot be displaced from the market. The competitiveness of the dairy industry is the key question of the accession strategy in this field.

Outlook

The market structure and policy frameworks of CEECs are approaching the EU level and will continue until accession. However, significant differences in breeding technology and milk processing will remain having negative economic effects after accession. In some regions certain producers can expect enormous economic difficulties.

The enlargement will bring fewer problems and more benefits for the EU side. It will obtain a new market for its products on the one hand and new partners for preservation of protection policy on the other. Milk quotas are put forward in accession negotiations in this field, hence, it cannot be expected that the EU will provide higher quotas than shown by data for a referred period. The public should be aware of strict production possibilities after accession. Modernisation in the field of competitiveness and acquisition of community harmonisation is essential for future development of the dairies. Dairies should decide whether produce for local markets can be maintained, or whether they should be trained for activities in the severe common market.

Negotiations are moving towards more sensitive areas, however, it is at a standstill with diplomatic manoeuvres from both sides. The EU puts forward implementation capacities; therefore, negotiations look more like monitoring of advancement than serious negotiations on rights, duties, money and power. Serious negotiations can be expected only when the date of enlargement and number of accessed countries are settled. The number of accessed countries will determine the level of discrimination of new members. The more candidates there are, the less possibilities there

will be for equal enlargement. A lot of extra money for enlargement cannot be anticipated. Some reforms of CAP before enlargement are probable. In the field of milk, higher levels of price liberalisation and extra support from national budgets are foreseen. Reforms will not be passed before the end of 2002 and so accession negotiations will not be finalised before then. Agriculture will be the last problem to be solved by diplomats from the EU and CEECs. The end of negotiations in 2002 will enable the enlargement in 2004. However, the discussion about the date of accession at the moment is very speculative.

The first accessing countries will find the enlargement unpleasant in the milk sector. The confrontation with the competitive common market will accompany lower budget inflows from Brussels. Border control might be used to moderate the negative effects. Hence the Euro-sceptics in the EU member states will be calmed down, while candidates will be promised transitional periods to enable them to adjust their administration and industry to accession. According to another scenario, a new budgetary period, continuation of reform of CAP, better adjustment of candidates and political will and willingness of member states, are expected. However, the enlargement will not be completed before 2006. In 2000 it is impossible to predict the form and quality of the next enlargement. Milk production in CEECs confronts hard times because a large part of adjustment to the EU requirements is a burden. Restructuring and modernisation of the dairy industry is essential and stimulated by the enlargement process but it looks forward to a more visionary approach of the EU with more assistance, confidence and less egoism and its own short-term political interests. Agriculture is and always will be, the great story of enlargement.

References

Baldwin, R., Francois, J.F. and Portes, R. 1997. The costs and benefits of eastern enlargement: the impact on the EU and central Europe. Economic Policy 24, 125-176 pp.

Bojnec, Š. and Swinnen, J. 1997. The pattern of agricultural price distortion in Central and Eastern Europe. Food Policy 22 (4), 289-306 pp.

CAP Monitor, 2000. Agra Europe (London) Ltd, Tunbridge Wells, UK.

Changes to EU direct aid system before enlargement? Agra Food East Europe 211, 3 pp.

Commission Draft Common Positions (DCPs) on agriculture forwarded to Council. Agra-Focus May 2000, 23-29 pp.

Enlargement negotiations formally start for "2nd wave" countries; differences over agriculture already emerging. Agra-Focus March 2000, 24-27 pp.

Erjavec, E., Rednak, M. and Volk, T. 1998. The European Union Enlargement - the case of agriculture in Slovenia. Food Policy 23 (5), 395-409 pp.

EU Common Positions for enlargement talks – more details needed on veterinary demands. Agra-Focus June 2000, 30-34 pp.

EU paper on CEECs avoids direct aid issue. Agra Food East Europe 211, 1-3 pp.

European Commission, 1995. Agricultural Situation and Prospects in Central and Eastern European Countries. Working Document. European Commission DG VI, Brussels, Belgium.

European Commission, 1998. Agricultural Situation and Prospects in Central and Eastern European Countries. Working Document. European Commission DG VI, Brussels, Belgium.

European Commission, 1999. Council Regulation (EC) No 1255/1999 of 17 May 1999 on the common organization of the market in milk and milk products.

European Commission, 1999. Council Regulation (EC) No 1256/1999 of 17 May 1999 amending Regulation (EEC) No 3950/92 establishing an additional levy in the milk and milk products sector.

European Commission, 2000. Agriculture in the European Union. Statistical and Economic information 1999. European Commission DG for Agriculture, Brussels, Belgium, 318 pp.

EuroStat, 1998. Theme 5 – Agriculture and Fisheries. NewCronos, Sec. B, European Communities, CD-ROM.

FAO databases, http://www.fao.org/ 10. 5. 2000.

Key enlargement negotiations on agriculture unlikely before 2001. Agra Focus April 2000, 32-44 pp.

OECD (Organisation for Economic Cooperation and Development) internal sources http://www.oecd.org/agr/apnme/ 10. 5. 2000.

OECD (Organisation for Economic Cooperation and Development), 2000. Agriculture Policies in Emerging and Transition Economies 2000. OECD Publications, Paris, France, 153 pp.

School milk: A question of who pays. Agra Focus April 2000, 3-4 pp.

Ritson, C. and Harvey, D.R. 1997. The Common Agricultural Policy. CAB International, Wallingford, UK, 435 pp.

Tracy, M., 1996. Agricultural Policy in the European Union and Other Market Economies. APS Agricultural Policy Studies, La Hutte, Belgium, 100 pp.

Identification and registration of cattle: a challenge for breeding organizations

W. Wismans[1] & T.M. Akkerman[2]

[1]AMSO, Oud Zevenaarsedijk 19, Oud Zevenaar, The Netherlands

[2]Royal Netherlands Embassy, Veterinary Attaché Central and Eastern Europe, POB 56, 1388 Budapest, Hungary

Abstract

The implementation of an identification and registration (I&R) system is a difficult and demanding process to reach expected and sometimes unexpected results. The animal health and breeding organizations have to cooperate to achieve an efficient and effective system covering the needs of all organizations and farmers. The I&R system has to register all farms and all cattle (or pigs, sheep and goats), register all movements of the cattle and the tracing back of individual cattle is possible.

The I&R system is a basic system and it should be an independent system which can be used by all organizations based on authorisation rules and by using standardised interfaces.

Breeding organizations (herd books, milk recording (MR), artificial insemination (AI), etc.) can play an important role in the execution of the I&R system and can benefit in using the I&R system to improve and enlarge their activities and offer the farmers more and better services at a lower cost. This requests active involvement of the breeding organizations in the development and implementation of a national I&R system.

Authorisation rules have to be established to guarantee reliability and to reach the best results.

This paper describes the conditions for the implementation of an I&R system, the activities to be done and the difficulties and the challenges for breeding organizations to be involved and to use the I&R system.

Key words: *National I&R systems, ID-methods, tracing of animals, database, active breeding population, product differentiation, marketing and labelling of meat.*

Introduction

The necessity to have or to implement an identification and registration (I&R) system is growing daily. To create a well functioning national I&R system is a challenge. Only a few countries worldwide have a national I&R system covering all cattle. The need for quality controlled production systems and new techniques has stimulated and will stimulate to improve the current I&R systems. Regulations increasingly prescribe the conditions for an I&R system to guarantee healthy and safety products for the consumers. Sometimes the regulations prevent the building up of a practical system or prevent the building up of a system that can be easily controlled. Cooperation of all organizations is a must to establish a well functioning I&R system.

It is important for every system but especially an I&R system that the system be:

- simple and practical;
- cheap;
- accepted by the farmers;
- based on international standards;
- usable for all purposes;
- quality control is possible at all levels;
- accepted to EU and EU rules.

History has taught us that it is not easy to fulfil the above conditions. The first four conditions are common and acceptable for everybody, although the opinions about the realisation can differ. The last two conditions are difficult ones and can create a lot of discussions during the developing process. Compromises on the last two conditions are obstructing a simple and cheap I&R system. To which extent the existing systems fulfil these conditions can be questioned.

Using an I&R system for all purposes today means:

- veterinary and zootechnical checks;
- breeding including performance recording;
- farm management;
- premiums;
- hormones and residue control;
- quality control on meat production including labelling of meat;
- chain control.

History

For more than one hundred years have animals have been registred in herd books. The animals were identified individually and only records on breeding were registered. In the fifties several countries started to identify animals for animal health programmes. These two systems were different and today in many countries only two systems exist, which is a big disadvantage. Having two or more systems is less farmer friendly and more expensive and the quality of the systems is lower.

Many identification methods are possible: eartag, tattoo, ear-notching, branding, paint marking, transponders (injectable, eartag and bolus), biometric methods or any combination of these. Today in the EU, cattle can only be identified by eartags. It is foreseen that transponders can be used from 2001 in national programmes, the use of biometric methods, maybe in combination with another ID-system, depends on results in practice in the near future.

The establishment of the Single Market in the EU and the implications for intra-community and other international trade has brought new inputs to the need for national I&R systems for animals. In 1992 the first EU Regulation for national I&R systems for farm animals came into force. Before 1992 only I&R regulations for pure-bred animals were in force. Animal health regulations for transport and import have existed since 1964.

In 1997 the regulations for cattle were updated and the Council Directive 820/97/EC has been in force since 1 July 1997. Updates for other species of farm animals are in progress.

To minimise the fraud with premiums in the EU, in 1998 it started a trial with electronic identification of cattle, sheep and goats. This project is called IDEA (Identification electronic des animeaux).

Until recently the requirements of an I&R system were only based on purposes during the life of animals. Consumers will have guarantees to buy a safe product, the processing of meat sets also requirements for the I&R system. This is very new and research and practical experiences are necessary to complement the system. The question is what is necessary to guarantee that each piece of meat can be traced back to its origin, the animal or a group of animals. Labelling of meat came into force on 1st January 2001.

Guidelines for national I&R systems

Before developing an I&R system the requirements should be agreed upon by all involved organizations. To prepare a proposal to the EU about "the EU requirements for the identification of cattle, pigs, sheep and goats" a working group of Copa/Cogeca made a report in October 1996 with this title. Minimum guidelines were worked out for the given species to fulfil requirements for animal health, animal breeding and premium payments to ensure traceability of animals in EU Member States. These guidelines are still valid.

The EU legislation 920/97 is a Council Directive, which means it has to be implemented at national level without any change. Still several details have to be decided at national level. As an example: the individual number of the animal at national level should not be more than 12 digits. How to create such a unique number is up to the Member States. When possible the number should be a consecutive number with reference to region, farm

number, etc. The reason for this is that the logistic of the eartags is much easier (less expensive) and the information about region, farm, etc., is stored in the computer.

In Central and Eastern European counties there is a preference to use the veterinary district and sometimes the number of the farm of origin is included, because the network today is not sophisticated enough, the database can be entered at district, village or farm level.

Another aspect in preparing guidelines is the tradition of identification and movement recording, the level of education of farmers and employees and the experience with the use of the computer.

It is clear that the conditions for an I&R system for cattle is different from that of pigs, sheep and goats.

Herd Information System (HIS)

An essential part of I&R systems is the identification of the holdings. Each holding needs a unique number at national level and the same number should be used for all purposes. Establishing such a HIS in combination with the use of data exchange realises the possibility for the data of farms collected in different systems to be combined to improve the support of the farmer in his farm management. It is a time consuming process to get agreement by all organizations on the use of the HIS number. The sooner the discussion is started the sooner the goal will be reached.

Identification of the animals

As far as possible the identification of the animals should be done by farmers. On small farms the private veterinarian or the breeding specialist (AI-technician or milk recording (MR) should carry out the identification of the animals).

Only international officially accepted methods of identification should be used. The “to be used” ID devices per manufacturer have to be approved for use. The test of the devices should be done by ICAR.

Retagging of animals is not allowed, only when the eartag is lost and the same ID number has to be used.

The breeding organizations use only officially approved methods. The farmer can use additional methods and these numbers can be presented on record sheets beside the official identification.

Registration of all movements

To have a system which guarantees that 100 percent tracing of all animals is possible, the movements of the animals have to be registered. Beside the possibility of tracing, it is a very good tool for controlling the system. The

EU is today requesting to report the movements within at least seven days, which is a good limit in the regulation. It is practical to ask the farmers and traders to report as much as possible the same day.

When the outgoing and incoming animals are registered individually in the database, the database can easily report the missing animals in the system. In this context it is good to realise that the use of the I&R system by breeding organizations also detects missing animals much easier and earlier. When breeding organizations use the same system it is not possible to move animals in the system through a breeding report to the system. Movement registration should only be possible by the I&R system and this system will update the other systems by data exchange.

When tracing is necessary there are two main functions:
- On which holdings, market places, etc. and for what period the animal is there and to determine the holding of origin.
- Which animals were at the same moment on the same holding.

Avoid doubles. In Central and Eastern European countries the farmer has also to inform the City Hall before an animal can be moved. This is not necessary after the introduction of the I&R system.

Another aspect is the use of a passport. Starting to record the movements is very important. When the I&R database is functioning well, it is no longer a duty to use the passport.

Monitoring of animal health status, hormone and residue examination

Thanks to a good I&R system, contagious diseases are quickly traced back to the source, therefore, adequate measures can be taken to prevent further spreading of the disease. As all movements are recorded, the I&R system perfectly supports the system for monitoring the animal health status on herd level.

For hormone and residue examination the I&R system can be used in two ways:
- notably hormone and residue control in the slaughterhouses;
- in case of suspicion, the farm location of the animal can be traced and further examination can be started.

Labelling beef and beef products

Today's consumer wants more and more information about food products. They expect guarantees and an open information stream. As a consequence of the BSE crises and the Dioxine, the improvement in the transparency of the conditions for the production of the products, particularly the traceability, is necessary.

The EU started the real discussion about labelling of the products by publishing Council Directive 820/97. The objective of labelling is to give

maximum transparency in the marketing of meat and meat products and shall in addition supply information about where the animals from which the meat was derived were born, reared and slaughtered. Urgent reflection is needed on this subject, bearing in mind that it may not be easy to design a global system applicable to all feed and food.

Database

Without the support of a database it is not possible to establish a good functioning national I&R system. The EC requested Member States to have a database operational as of 1st January 2000. Some countries already have long and positive experiences with a database.

The database should record at least:

- identification code;
- new identification code when different;
- registration number when different;
- number of origin when different;
- date of birth;
- number of holding of birth;
- all dates of movement and number of holdings, market places, etc.;
- date of death or export;
- date of import;
- country of origin (birth);
- country of import;
- sex;
- mother of the animal;
- health status of holdings;
- health status of animal.

The data communication between the I&R database and other national and international databases should be in accordance with international standards. Today this is the ISO standard for data exchange. Presently the slaughterhouses, retailers and supermarkets use the EAN standard INCOME. Which protocol to use should be discussed and decided upon or databases should communicate by using one of the two protocols.

The more organizations that use the I&R database for their activities, the more reliable are the data in the database.

Quality control and supervision

Quality control becomes more and more important. Two aspects have to be considered: the (administrative) process control as is done by the 9000 ISO standards and product quality.

The ISO standards will not be discussed in this paper. Product quality, which means the quality of the data is essential for the good functioning of a national I&R system. The EU prescribes to carry out quality checks and also ICAR is asking for this. Through the database, several checks can

be carried out for no extra costs. Furthermore, it is important to visit the holdings where the identification is carried out, traders, markets and slaughterhouses, etc.

Tasks of breeding organizations

The main tasks of a breeding organization are to:

1. Support farmers in herd management by offering:
   a. herd book registration;
   b. performance recording (milk, beef, type and fertility, etc.);
   c. artificial insemination and embryo transplantation;
   d. herd management tools.
2. Support the selling and buying of animals.
3. Carry out breeding programmes.

When combining all activities within one organization, the national database, including the responsibility for the estimation of breeding values, should be organized in a separate body or at national level, other organizations or firms should carry out the activities given under 2 and 3.

Breeding organizations and the I&R system

In many countries the tasks of the herd book will change totally when I&R is introduced. The identification and registration in a database is already done. Based on the information received from the I&R database, through the database, breeding organizations take care that the pedigree registration is done and a document per animal can be produced showing the data and pedigree of the animal.

The breeding organizations have to study the following aspects:

- getting farmers interested in the registration of all animals (males included) in the herd book;
- regulating by constitution the data in the I&R database to avoid problems with the privacy of information;
- basing the fee for herd book registration on the additional activities to be done and stimulating the fee system, the farmer registers all animals in the herd book;
- accepting only the ID methods accepted for the I&R system and always presenting the ID number on documents;
- farmers and breeding organizations may use additional ID methods for internal use;
- registering the data on the insemination and embryo transfers into the breeding database before the cow calves;
- bloodtyping or DNA fingerprinting to supervise herd book registration (and can also be used to control the I&R system);
- trying to also establish breeding values for beef traits and longevity. The breeding values are used to promote the breed;
- trying to realise that the I&R database is located in the same building where the breeding database is located.

Organizational aspects for breeding organizations

To realise the breeding organizations actively involved in the I&R system, the following aspects have to be considered:

1. A national structure of the breeding organizations is necessary to realise their involvement.
2. The breeding organizations mainly register a low number of animals. This is a handicap to realise the breeding organizations becoming actively involved in the I&R system and becoming responsible for the activities to be done at farm level.
3. Veterinary departments or agencies underestimate the complexity of the I&R system, the consequences for other organizations and persons (slaughterhouses, traders, markets, veterinary stations, farmers, etc.) and mostly do not initiate the cooperation with the breeding organizations.
4. In Central and Eastern Europe the existence of many small farms and common grazing is an additional complication in introducing a national I&R system.
5. To carry out herd book registration with or without a national I&R system is totally different. Using the I&R system cuts down the farm activities (needed people) and it requests PC-driven activities.
6. The I&R system has much more influence over the other activities of the breeding organizations as is expected (method of collection of data, the data flow and dependency of the I&R system).

Finally

To guarantee the quality of the products and to fulfil the wishes of consumers, a national I&R system is a must. It is an on-going process (new, sometimes complex developments and further internationalisation of our activities) and new regulations become increasingly stricter. Cooperation between the veterinary department and the breeding organizations is another great challenge to establish an efficient and effective system which is the basis for all other activities of the veterinary department and of the breeding organizations. In the near future, electronic identification will be used in national I&R systems.

Breeding organizations should communicate internationally regarding the changes in structure and activities. Last but not least the involvement of Central and Eastern European countries in EU legislation is necessary to establish that the EU legislation will also work in these countries. The problem of the small herds and common grazing by running an I&R system is the best example in this regard.

References

Akkerman, A.M. 1999. The identification and registration system for cattle in The Netherlands, I&R seminar Romania, 23rd March 1999.

Eradus, W.J. and Rossing, W. 1994. Animal identification, key to farm automation. Proceedings of the 5th International Conference Computers in Agriculture 1994, 6–9 February 1994, Orlondo, Florida, (ASAE Pub. 03 – 94), 189-193 pp.

Geers, R. *et al*. 1997. Electronic Identification, Monitoring and Tracking of Animals, CAB International, Oxford.

Hobo, J. 1998. The necessity for identification and registration of bovine animals from birth to consumer, performance recording of animals: State-of-the-art, 1998, (EAAP publication no 91, 1998. 53–58 pp).

Wilmink, J.B.M. 1997. EC Regulations for Identification and Registration, Performance recording and genetic evaluation and trade of semen and animals, Hungarian – Polish Workshop on Animal Breeding, 3-4 June 1997, Warsaw, Poland.

Wismans, W.M.G. 1992. The identification and registration in The Netherlands, Performance recording of animals: State-of-the-art, 1992, EAAP publication no. 61, 1993. 159–162 pp.

Wismans, W.M.G. 1995. The importance of a closed I&R system for cattle and a central database in The Netherlands, Proceedings of National Livestock Identification Symposium 1994, 8-9 December in St. Louis USA, Livestock Conservation Institute, USA, 52–63 pp.

Wismans, W.M.G. 1999. The identification and registration of animals in the EU. Computers and Electronics in Agriculture 24, 99–108 pp.

Annex 1 - EU Regulations

The most important points in the EU Directive 92/102/EEC of 27 November 1992 are:

1. Farm animals (cattle, pigs, sheep and goats) must be identified in accordance with the EU Regulations.
2. The tracing of animals to its original or transit holding must be possible.
3. Animals must be identified before leaving the farm and for cattle also within 30 days.
4. Cattle must be identified by eartags.
5. Eartags shall be approved by the competent authority and shall be tamperproof and easy to read during the animals' lifetime.
6. In case the mark has become lost or illegible, a new mark must be applied. When a new number is used a link between the two numbers must re-established.
7. When imported animals are remarked a link between the number of origin and the new number must be established.
8. Keepers of animals must maintain up-to-date records of the animals on their holdings. For cattle all individual movements including birth must be recorded.
9. The holding registers must be available on the holding and to the competent authority for at least three years.
10. The competent authorities must have an up-to-date list of all holdings, specifying the species of animals kept and their keepers.
11. Any keeper of animals to be moved to or from a market or collection centre provides a document that accompanies the animals.
12. Any keeper must, on request, supply the competent authority with all information needed.

For cattle the Regulation has been amended since 1 July 1997 the Council Regulation 820/97 is in force. The timetable for the implementation of different parts of the Regulation is:

1 July 1997	Marking of calves within 30 days and reporting of birth and movements within 20 days; any cattle from another Member State shall retain its original eartag; no eartags may be removed or replaced without permission of the competent authority and data in the holding register or database should at least be available for three years.
1 January 1998	Issuing of passports for new registered animals and whenever an animal is moved, it shall be accompanied by its passport, only when a national database is operational does a passport have to be issued and used for export; new born calves have to be identified with two approved eartags and used eartags which do not comply with the requirements of the regulation shall be replaced before this date.

1 September 1998	All animals except slaughter animals for export have to be identified in accordance with the Regulation.
1 September1999	Also slaughter animals have to be identified in accordance with the Regulation.
1 January 2000	Marking of calves must be done within 20 days and reporting of birth and movements within seven days; a national database should be operational in the Member States; meat to be exported must be labelled and a decision about electronic identification has to be taken.

Details of the Regulation are given in the Commission Regulations Nos. 2628/97, 2629/97, 2630/97 and 494/98 concerning:

- requirements for eartags;
- requirements for the passport;
- requirements for the herd register;
- minimum level of controls to be carried out;
- application of penalties;
- transitional provisions for the start-up period of the system.

On a free basis the labelling of meat is possible. In the same Council Directive 820/97 in Title II the Regulations are given. The important points are:

- labelling must be done in accordance with the Title of 820/97;
- only approved operators or organizations by the competent authority may label meat;
- only information which can be easily checked at the point of sale may be printed on the label;
- only the following information may be given:
- country or holding of birth;
- country of holding of fattening;
- country or holding of slaughtering;
- identification number and sex of animal;
- method of fattening or other information relating to feeding;
- information on slaughtering (age, date, maturing);
- other information with acceptance of the competent authority;
- the name or logo of the approved operator or organization must be given on the label;
- withdraw of approval or imposing supplementary conditions;
- a compulsory beef labelling system will be obligatory in all Member States from 1 January 2001 onwards and before this date the Commission will take a decision about the rules for the compulsory system.

Member States with a functional I&R system for bovine animals may impose a compulsory labelling system before 2001.

Member States have to inform the Commission about the implementation of the labelling system for beef.

Breeder associations, milk recording and identification of cattle and sheep in the Czech Republic

V. Cermak

Czech-Moravian Breeders' Corporation, Ltd., U topíren 2, 17041 Praha 7, Czech Republic

Main features of the Czech Republic

Total area	78 886 km²
Population	10 304 300
Population density	131 inhabitants / km²
Number of Regions	14
Distance (in km) from Prague to:	Paris – 880, London – 1 160, Stockholm – 1 050, Moscow - 1 670, Bucharest – 1 080, Rome - 920

Introduction

Table 1. Gross agricultural product – current prices (bill. EURO).

Year	1998
GAP	2.13
GAP as % of GDP	4.3
Number employed in agric (primary Production)	1989 – 533 100 1995 – 221 600 1998 –206 000
Number employed in processing	156 000

Table 2. Main sectors in agriculture.

Item	Output 1998 (bill. EURO)	1998 (mil t.)
Cereals	0.386	6.669
Potatoes	0.075	1.512
Oilcrops	0.111	0.779
Fruits	0.044	0.371
Hops	0.014	0.0007
Sugar beet	0.044	3.479
Beef	0.183	0.247
Milk	0.339	2.716
Pigs	0.372	0.714
Poultry	0.119	0.240
Eggs	0.094	3.615 (mil. pcs)
Gross agricultural production	2.147	-

Table 3. Farm structure (use of agricultural land) by type and size (1998).

Category	Number of entities	'000 ha	%	Average size of holding (ha)
Physical persons *	32 365	850	23.7	26
Legal persons	2 146	1 452	40.6	677
Cooperatives	875	1 235	34.5	1 411
Others			1.2	

*Registered as farmers.

Table 4. Structure of size of the agricultural farms (1998).

	Number of farms		Land	
Size of farms	Total	%	Ha	%
- 10 ha	12 812	49.4	64 044	1.8
11- 50 ha	8 271	31.9	182 548	5.1
51- 100 ha	1 320	5.1	92 556	2.6
101 – 500 ha	1 575	6.1	369 812	10.3
500- 1000 ha	762	2.9	566 325	15.8
1001- 2000 ha	781	3.0	1 108 973	31.0
Over 2000 ha	403	1.6	1 196 850	33.4
Total	25 924		3 580 850*	

*total is less than total agricultural land due to exclusion of family gardens.

Table 5. Dairy/Cattle Sector.

Item	1989	1995	1999
Total Cattle numbers ('000)		2 030	1 503
Number of cows (million cows)	1 248	768	590
Total milk output (million l)	4 900	3 031	2 717
Total beef production ('000 tonnes lw)	518	322	246

Table 6. Pig sector.

Item	1989	1995	1999
Number of pigs ('000 heads)	4 685	3 867	4 001
Sows	312	295	312*
Pigs/sow/year			20
Gain (kg/day/pig)	0.63	0.62	0.64*
Pig meat production ('000 t/year liveweight)	778	650	669*

*1998 data.

Table 7. Number of farms and stables in the performance recording.

Year	Number of farms	Number of recorded cows total	Number of cows/farm	Number of recorded stables	Number of cows/stable
1994	3 649	741 033	203	10 497	71
1996	3 121	607 659	195	6 340	96
1998	2 743	524 780	191	5 213	101
1999	2 621	501 705	191	4 656	107
Difference[1)]	-122	-23 075	0	-557	+6

[1)]difference between 1999 and 1998.

Table 8. Development of breeding structure of milk recorded cows since 1990.

	Cow numbers in				Index to
Breed	1990	1995	1998	1999	year 1990
Cows in total	1 221 749	667 973	526 779	501 705	41.1
From which					
Czech Red Pied	637 392	369 289	280 053	262 140	41.1
Black and White	500 767	251 150	236 656	229 389	45.8
Others	83 590	47 534	10 070	10 176	11.9

Table 9. Proportional representation of farms and stables according to the number of recorded cows in 1999.

Number of cows in a stable	Farms (2 621) farms (%)	stables / farm	proportion of cows (%)	Stables (4 656) stables (%)	proportion of cows (%)
1 - 10	10.2	1.0	0.3	9.8	0.4
11 - 30	14.7	1.0	1.4	10.4	1.7
31 - 50	7.8	1.0	1.6	7.0	2.5
51 - 100	15.2	1.1	5.9	32.4	22.4
101 - 150	8.6	1.2	5.5	15.0	15.9
151 - 200	9.1	1.5	8.2	11.3	16.9
201 - 300	10.7	1.8	13.4	6.9	14.5
301 - 400	8.3	2.2	14.8	4.3	12.8
401 - 500	5.5	2.7	12.6	1.9	7.5
and 500	9.9	4.3	36.3	1.0	5.4
Totally	100.0	1.8	100.0	100.0	100.0

Agricultural production represents 4.3 percent of GDP in the Czech Republic. Production is oriented at growing grain crops, oil bearing crops and potatoes. Animal production is focused on milk and meat (beef, pork and poultry) production. Legal persons (agricultural cooperatives, joint stock companies, etc.) manage 75 percent while private farmers manage 23.7 percent of the agricultural land. There are less than 10 percent of farms of a size up to 100 ha of land, on the other hand, enterprises managing more than 1 000 ha represent more than 64 percent.

The number of milk recorded cows was 501 000 in 1999, which is 41 percent of the number in 1990. The total number of cattle was reduced similarly. Gradually the size of milk recorded herds increased; in 1994 there were 71 cows in one recorded herd, in 1999 more than 100 (107 cows).

Breeder associations

Breeder associations were established in 1990 as non-profit organizations. These organizations are responsible for:

- running herd books and issuing pedigree certificates;
- coordination and methodological leading of breeding programmes;
- determination of selection criteria;
- coordination of breeding bull testing;
- advisory service for their members;
- organization of exhibitions;
- international cooperation.

There are the following breeder associations in the Czech Republic:

- Association of Czech Spotted Cattle Breeders
- Association of Black and White Cattle Breeders
- Association of Beef Cattle Breeders.

Czech-Moravian Breeders' Corporation. Hradištko pod Medníkem

The Czech-Moravian Breeders' Corporation (CMBC) was established by privatisation of the State Breeding Enterprise in 1996. The corporation was transformed to a joint stock company in 2000. The Corporation is owned by the Association of Black and White Cattle Breeders in the Czech Republic (45 percent), the Association of Czech Fleckvieh Breeders (45 percent) and the Breeders' Union. The main aim of the Corporation is to ensure the following activities:

Central recording

- Running the national system of milk recording and artificial insemination including data processing, complementation of the database and providing breeders and AI stations with output data sets.
- The Corporation was authorised by the Ministry of Agriculture of the Czech Republic to run the system of central identification and registration of cattle according to requirements of the Council Decision of the European Communities No. 820/97. The computer programme was modified and the processing was started including the distribution of eartags and animal movement recording.

Herd book running

The database of imported animals was complemented and the work on the methodology of a centrally operated testing programme was initiated. Issuing of pedigree certificates of breeding bulls was started and the system of recording and issuing of embryo pedigree certificates was developed.

Genetic evaluation data processing

- The Corporation is responsible for the calculation of breeding values in Black and White and Czech Fleckvieh breeds. In 1998 the Animal Model used in calculation of breeding values for milk was modified. As is common in most countries, second and third lactations of cows are incorporated into the calculation.
- The single trait Animal Model without repeating was developed to estimate breeding values of bulls for type traits. In this model each type trait is evaluated by separate calculation.

Milk recording and laboratories for milk analysis

Data transfer via internet between laboratories and a central computer was initiated. The laboratories extended their analytical activities by means of regular determination of urea contents. Laboratories analysed a total of 4.5 million milk samples. More then 90 percent of the samples were analysed for purposes of milk recording (for fat, protein and lactose contents). The cell count was determined at 2.1 million samples.

Immunological laboratory

The immunological laboratory provides pedigree verification of cattle, horses, pigs, sheep, goats and dogs using the standard technology (blood types). The usage of DNA technology has already been started and is used increasingly more frequently. The genetic traits BLAD, CAS, RED in cattle and MHS in pigs are determined by this technology.

Local breeding service centres

Centres in cooperation with associations of breeders and local agrar chambers provide extension services for breeders. They are responsible for checking the accurate identification of animals according to EU regulations and the observance of herd books and ICAR rules.

Artificial insemination stations were privatised through coupon privatisation. At present, there are eight joint-stock companies in the Czech Republic keeping breeding bulls, producing semen and providing AI services. They are mutually competitive. Some of these companies are co-owned by farmers.

Milk recording

Performance recording was introduced in the Czech Republic in 1905. Since 1994 the Czech Republic has been a member of ICAR and INTERBULL. The member organization representing our country is the Czech-Moravian Breeders' Corporation, JSC. Since 1996 the Czech Republic has been authorised to use the ICAR stamp.

In the Czech Republic 91 percent of all cows are milk recorded. Globally it ranks the country among the ones with the highest proportion of milk recorded cows. In harmony with the standard ISO 1546 from 1991, two primary methods (A and B) of milk recording are utilised. The recording ***method A*** is executed by an authorised person (control assistant). In accordance with the determined methods the amount of milk is recorded and samples either from each milking during the control day (A_4) or alternately from morning and evening milking each month (A_T) are collected.

The interval between two control days must be from 24 to 36 days in A_4. However, the average interval during the year must be from 28 to 30 days.

The recording ***method B*** is carried out by a breeder. In the last five years the proportion of cows recorded using the method A_4 increased at the expense of the method A_T. The number of cows under the method B is negligible.

Annual costs of milk recording are similar to the purchase price of 40 kg milk. Seventy-five percent of milk recording costs are paid by a breeder. The State subsidises the recording to a maximum of 25 percent.

Table 10. Extent of milk recording in Czech Republic.

Year	Number of cows		Milk recorded		Method of milk recording (% cows)			
	total	milked	cows	%	A_4	A_T	B	total
1994	829 729	829 729	741 033	93.4	94.7		5.3	100
1996	750 593	712 000	607 659	94.8	94.8	11.5	0.1	100
1998	646 838	598 000	524 780	92.4	92.4	8.5	0.1	100
1999	642 026	583 000	501 705	90.8	90.8	6.1	0.1	100
Diff.[1)]	-4 812	-15 000	-23 075	-1.6	-1.6	-2.4	0.0	x

[1)]difference between 1999 and 1998.

There are two milk analysing laboratories in the Czech Republic (each of them has several more branches). The laboratories are equipped with Bentley and Somacount instruments. Samples are analysed to determine the content of fat, protein and lactose and at least at the request of a breeder, the somatic cell count and urea as well. At present, the somatic cell count is determined in 45 percent of all samples.

In the Research Institute of Cattle Breeding in Rapotín, there is a reference laboratory involved in the international circle tests organized by the CECALAIT laboratory in Paris. All the national laboratories are then involved in the national circle tests and calibration through the reference laboratory.

Table 11. Milk recording results for individual breeds in the control year 1998/99.

Breed Lactation number	Number of compl. lactations	Lactation days	Milk (kg)	Fat		Protein		Calving interval
				%	kg	%	kg	
Black and White (H100)								
1999	81 366	297	6 303	4.18	263	3.31	209	410
1998	69 742	296	5 851	4.23	247	3.26	190	412
Black and White including crosses from grading up crossing								
1999	158 773	296	6 124	4.20	257	3.32	203	404
1998	144 439	295	5 648	4.26	140	3.27	184	407
Czech Spotted totally								
1999	228 892	292	5 098	4.35	222	3.41	174	394
1998	222 632	292	4 774	4.35	208	3.37	161	397
Other breeds totally								
Montbel.	1 244	294	6 432	4.12	265	3.46	222	406
Ayrshire	396	297	5 249	3.39	230	3.28	172	421
Jersey	323	296	4 959	6.44	319	4.07	202	392
Milk recorded cows totally								
1999	428 942	294	5 478	4.29	235	3.38	185	398
1998	409 531	293	5 079	4.32	219	3.33	169	400

Animal identification and registration

Cattle identification by means of eartags was introduced in the Czech Republic in the 1960s, therefore, it has now been used for about 40 years. This kind of identification was, however, obligatory only for inseminated cows. At that time the animals were identified not immediately after birth but the heifer was tagged only at the first insemination. Later in the 1980s all the calves from milk recorded cows (approximately 95 percent of all cows) were required to be identified. However, in reality only heifers and not bulls were always tagged.

At present, it is compulsory to identify each animal by an eartag within 72 hours after birth. For a number of years, all the cows from milk recorded cows have been identified by two eartags. One plastic and one metal tag are used in the Czech Republic. The plastic tag is inscribed using the laser so that the inscription is impossible to wipe away. Earlier the number was of six digits but several years ago it was changed to nine digits so that no number is repeated for at least 200 years. In the last four years, the plastic tag has also included, in harmony with EU requirements, the country's abbreviation CZ and the logo CMSCH (Czech-Moravian Breeders' Corporation).

The eartag (code of animal) consists of:

- abbreviation of country – CZ;
- six digits of a serial number of the animal within the district where it was born;
- three digits encoding the district.

It is also possible to identify the sex of the animal from the code of district.

The required identification system was introduced in the Czech Republic at the end of 1998. At present, about 15 000 breeders and more than 1 200 000 animals, i.e. more than 75 percent of all animals are registered in this system. The whole cattle population should be involved by the end of 2000.

Electronic identification will not be introduced in the near future because of its high costs. Data collection is usually carried out by mail. Afterwards the data are centrally analysed. Most enterprises send their data as a data file on a diskette. Some of them have started to send them via Internet.

For each animal an "accompanying document of animal" is issued. This document accompanies the animal for the rest of its life and all whereabouts of the animal are entered into it. All insemination are also recorded here. Using the central computer, data on date of birth, breed of animal, sire, dam and dam's sire are filled in the document. The pedigree of animal is put together based on AI and milk recording data.

Similar systems, although a little simplified, are being developed for other species as well. In 2000 they will be introduced for sheep and goats and in the second half of 2001 the registration of pigs will be commenced.

Information on animal production in Armenia

T. Chitchyan

Armenian Academy of Agricultural Sciences

In Armenia, the two main breeds of cattle are the Caucasian brown (80 percent) and black and white cattle (16 percent). The total population of 220 000 dairy cows is held by small farmers having six to eight cows each. In such a farm structure, it is very difficult to organize any breeding work aimed at increasing productivity of animals. The inadequate breeding work and the poor feeding are the principal reasons for the low average milk yield (in 1999 it was 1 800 kg with 3.8 fat). For the production of 1 kg of milk we use 1.3 kg of feed. The price of milk is US$ 0.25 per kg.

The future programmes for an increase in milk production is based on crossing the Caucasian brown with the American Swiss brown and black and white breed with Holstein.

The role of breeder organisations and the state of animal identification and recording in Slovakia

L. Dobrovic

The State Breeding Institute of the Slovak Republic,
Starohájska 29, SVK- 852 27, Bratislava,
Slovak Republic

Breeding organisations in Slovakia in terms of the applicable law ensure the keeping of herdbooks and breeding programmes of individual breeds and species in the area of breeding tasks.

Breeder organisations (breeder associations) do not directly participate in the execution of tasks in the area of the identification of animals and recording.

The tasks relating to ensuring identification of animals and the execution of recording of livestock animals (cattle, pigs, sheep, goats, poultry) are assured by the State through an authorised breeding organisation which is the State Breeding Institute of the Slovak Republic (SBI SR), which is uniform throughout the whole of Slovakia.

SBI SR in terms of the law executes the recording through its regional centres. Analyses of milk from cows and sheep for purposes of recording are executed in the central laboratory of SBI SR in Zilina (whose accreditation should be completed this year). Results of recording are elaborated at the computer centre of SBI SR in Zilina. SBI SR publishes every year official results of recording for the respective species of livestock animals for necessity of the agricultural public.

In the area of legislation the actual breeding in Slovakia is sheltered by the Law No. 194/98 relating to breeding of livestock. The following implementary notices with relevant enclosures are being prepared for:

1. Notice on the identification and keeping of central records of livestock animals.
2. Notice on the recording and heritability of livestock animals.

The above-mentioned law and prepared implementary notices to the law are compatible with relevant EU directives and standards.

SBI SR shall also be responsible for the implementation of the EU Directive No. 820 / 97 for the identification of animals and keeping of central records of shifting animals in connection with health of the cattle, beef and beef products in the conditions of the Slovak Republic. SBI SR shall ensure the implementation of this directive in co-operation with a veterinary organisation.

The introduction of central records shall also be supported within the framework of the project PHARE where a co-operation agreement with an Italian group from the Veneto region for the implementation of the EU Directive 820 / 97 in Slovak conditions, is being prepared. In the framework of the above-mentioned project, it is possible to obtain financial support from funds of PHARE for the procurement of consultancy, software, hardware and identification material.

Breeder associations, milk recording and identification of cattle and sheep in Slovenia

F. Habe, M. Klopcic, S. Kavcic, M. Drobnic, J. Osterc, M. Cepon, D. Kompan, T. Golc & E. Erjavec

University of Ljubljana, Biotechnical Faculty, Zootechnical Dept., Groblje 3, SLO-1230 Domzale, Slovenia

Geographic position

The Republic of Slovenia is one of the youngest countries in Europe. As a distinctively transit Central-European county, it is located at an important traffic crossing from the Alps to the Balkan region, i.e. from the Danube river region to the Mediterranean Sea.

Table 1. Basic data.

Territory	20 256 km
Geographical macroregions	Alpine (12 percent of territory), Sub-alpine (31 percent), Sub-pannonian (23 percent), Dinaric-Karst (26 percent), Sub-Mediterranean (8 percent)
Inhabitants (1998)	1 982 603
Population density	97.9 inhabitants / km²
Rural population	57.3

Current situation in agriculture

In recent years, agriculture has contributed less than 4 percent to the GDP and has employed around 6 percent of the active labour force in Slovenia. As an important social and political factor in rural areas, agriculture is of greater national importance than indicated by more macroeconomic indicators.

The Republic of Slovenia remains a net importer of agri-food products. Exports only cover about 45 percent of the imports. The Republic of Slovenia has low self-sufficiency levels which are especially apparent in oil, cereals, sugar and pigmeat. There is a constant surplus in hops, poultry and milk production. Exports are also important in certain processed products (quality beef and meat products, quality wine and beer). Slovenian

Table 2. Main macroeconomic indicators and importance of agriculture in the Slovenian economy.

		1990	1993	1997	1998	1999
GDP per capita	US$	8 823	6 366	9 163	9 847	9 970
GDP	% change	-4.7	2.8	4.6	3.9	3.8
Inflation	% change	549.7	32.3	9.1	7.9	6.1
Unemployment	% labour force	4.7	15.4	14.8	14.6	13.0
Share of agriculture:		1993	1995	1996	1997	1998
in employment	%	7.5	6.4	5.8	5.6	5.6
in GDP	%	4.1	4.0	3.9	3.7	3.6

agriculture and the food processing industry are well connected to international trade channels. The most important export markets are those states which have emerged from the former Social Federal Republic of Yugoslavia (SFRY) (Croatia, Former Yugoslav Republic of Macedonia (FYROM) and Bosnia and Herzegovina). Most imported goods originate from the European Union's common market.

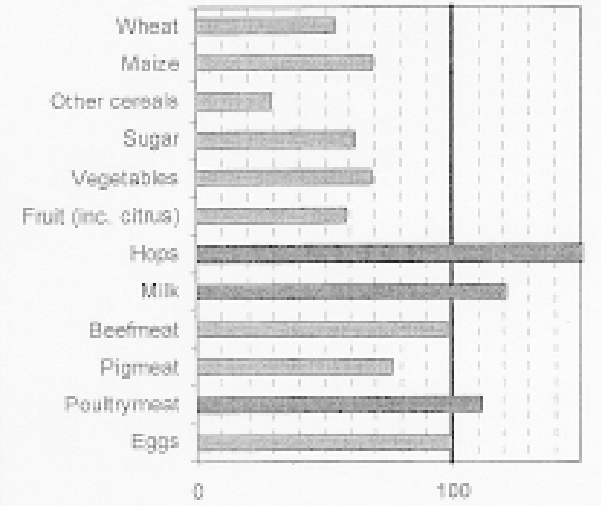


Figure 1. Self-sufficiency levels for the most important agricultural commodities.

The natural conditions for agricultural production are relatively unfavourable in the Republic of Slovenia. Slovenia is highly forested, the share of agricultural land in the total surface area is low and the terrain configuration is unfavourable, resulting in a large share of agricultural land designated as less favoured areas. Slovenia has a high share of permanent pastures and a low share of arable areas in the structure of agricultural land use. The Republic of Slovenia classifies over 70 percent

of its agricultural areas under less favoured areas for agricultural production. The natural conditions implicate a lower production capacity and costlier production.

The natural conditions and the structural shortcomings reduce the competitiveness of Slovenian agriculture compared to European agriculture.

Slovenian agriculture was developing in a specific political and economic environment in the post-war period, a fact reflected also by its farm structure. Two very different forms of agricultural production developed: social (a kind of collective) farming on large holdings and private farming on small family farms. While the European Union was undergoing intensive structural changes (increase in farm size, specialisation, intensification), Former Yugoslavia mainly favoured social-collective farming, whereas the development of private farming was discriminated against through various measures. Thus, the development of the Republic of Slovenia's private farming, which cultivates over 90 percent of

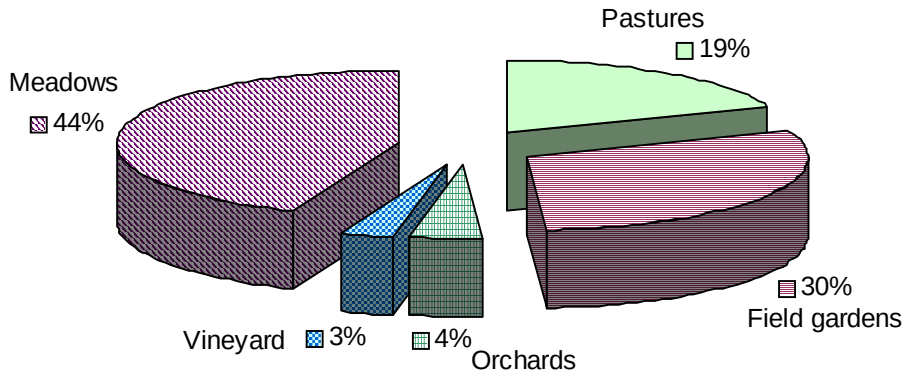


Figure 2. Structure of utilised agriculture area (UAA).

Table 3. Number of farms and total area owned by farm type and area farmed in 1997.

	Total		Full time		Part time		Supplementary		Aged	
Size (ha)	No	ha	No	ha	No	ha	No	ha	No	ha
Total	90 459	854 164	13 844	182 515	25 276	258 113	41 645	337 661	9 695	75 875
<1	8 141	34 042	154	445	842	5 041	5 239	20 510	1 907	8 046
1.01-2	16 585	62 634	1 341	4 831	2 975	11 152	9 528	34 576	2 742	12 076
2.01-3	14 038	76 443	1 377	6 388	3 450	17 503	7 646	42 585	1 565	9 968
3.01-4	11 606	82 955	1 468	10 575	3 620	24 418	5 497	39 435	1 022	8 527
4.01-5	8 645	81 528	1 181	10 880	3 146	29 485	3 585	35 200	733	5 964
5.01-10	22 762	307 707	4 989	72 031	8 018	101 063	8 328	112 860	1 427	21 752
10.01-20	7 756	175 450	2 890	62 910	2 951	61 829	1 655	42 995	259	7 716
>20	927	33 407	444	14 456	275	7 624	167	9 501	41	1 826

agricultural land, started lagging behind the agricultural development in previously comparable Central European countries. An unfavourable farm structure is reflected by the average holding size (5 ha of agricultural land per holding) and by the fact that over 85 percent of agricultural land in the Republic of Slovenia is cultivated by farmers who cultivate less than 20 ha of agricultural land in total. The unfavourable size structure is also reflected by the lower productivity of production. Another consequence of the unfavourable farm structure is the low rate of professionalisation, i.e. a small share of full-time farms.

The scope of agricultural production has been more or less stagnating in recent years. The most important agricultural sector is animal husbandry, accounting for over two thirds of the value of the total agricultural production structure. Milk and meat production using dual purpose cattle accounts for the highest share. Also important is pig and poultry production. Sheep production has been on the rise in recent years. The scope and structure of crop production have been vastly subordinated to the needs of animal husbandry. The most common crop is maize (grain and silage), covering over 40 percent of all fields. Among industrial crops sugar beet production is the most widely spread, while hop production occupies a special place since it is traditionally an export commodity. Wine growing also has an important tradition in the Republic of Slovenia. The diversity of natural conditions allows for the production of various fruits, apples being the leading fruit species. The intensity of cultivation has been on the rise in recent years, although the average yield per hectare remains below European Union levels in most cases.

Table 4. Structure of agricultural output.

	1992	1994	1996	1998
Total Agricultural Output	100.0	100.0	100.0	100.0
Plant production	45.6	50.4	42.1	44.6
Arable crops	33.2	39.3	30.2	33.5
Cereals	7.8	8.7	8.7	8.8
Industrial plants	2.1	2.5	3.0	3.2
Vegetables	8.9	7.4	8.7	8.5
Fodder crops	4.9	7.1	1.6	3.9
Green forage crops	9.5	13.6	8.2	9.1
Fresh fruits	5.4	5.5	5.8	4.0
Grape	7.0	5.6	6.1	7.1
Animal production	54.4	49.6	57.9	55.4
Cattle and milk	28.0	27.0	32.7	30.5
Pigs	12.6	12.5	11.8	11.8
Sheep, milk and wool	0.0	0.2	0.4	0.6
Poultry and eggs	13.6	9.6	12.7	12.1
Honey	0.2-	0.3	0.3	0.3

Source: SORS

Table 5. Livestock number ('000 heads; at the end of the year).

	1961	1971	1981	1991	1992	1993	1994	1995	1996	1997	1998	1999
Horses	54	40	17	11	9	9	8	8	9	10*	10	10
Cattle	595	508	565	484	504	478	477	496	486	446	453	471
Pigs	517	445	544	529	602	592	571	592	552	578	592	558
Sheep	49	24	16	28	22	27	29	39	43	53*	72	73
Goats					12	9	10	11	9	21 *	17	151
Poultry	2 392	5 386	11 582	13 134	6 152	6 192	5 794	4 920	5 773	7 058	8 550	8 550

*at 01-06-1997

Despite many problems and market losses after Slovenian independence, the production level has not been dramatically reduced like in many other CEE countries during transition, the exception being only the poultry sector. Export of milk and poultry products has been mostly reoriented into OECD and EU countries.

Organization of the cattle breeding service of Slovenia

Cattle breeding in Slovenia is organized in the National Cattle Breeding Programme run by the Cattle Breeding Service of Slovenia (CBS). The CBS is an association of a number of organizations and functions as a public service financed by the Ministry of Agriculture, Forestry and Food.

The main responsibility of the CBS is to steer and manage the national programme. Its main tasks include: conducting milk recording, beef performance recording and registration of animals running the selection (testing and breeding value prediction), controlling the herd book and pedigree service (pedigree certificates), advising on various topics: reproduction, animal health, nutrition, farm economics, marketing, etc., developing new methods and applying them to practice.

The Cattle Breeding Service of Slovenia operates on three levels:
- Central service;
- Regional Agricultural Institutions, Insemination Centres and Test Stations
- Breeder Organizations

Central Service

Central Cattle Breeding Service form the following institutions:
- Biotechnical Faculty, Zootechnical Department, Domzale;
- Agricultural Institute of Slovenia, Ljubljana;
- Veterinary Faculty, Ljubljana;
- Agricultural Faculty, Maribor.

Following the CBS programme, the four institutions abide to their sub-programmes. The Central Service performs the following tasks:

- prepares breeding programmes;
- forms a central database;
- processes recording data;
- predicts breeding values;
- carries out the preselection of elite animals;
- coordinates work and represents the Service in the country and abroad;
- publishes various publications, annual reports and sire catalogues.

Regional agricultural institutions, insemination centres and test stations

Six regional agricultural institutions are located in Murska Sobota, Ptuj, Celje, Ljubljana, Kranj and Nova Gorica. Part of their programme takes part in the National Breeding Programmes and their responsibilities include:

- recording and milk sample analysis;
- data collection for breeding programmes (conformation scoring of animals, milking ability);
- selection of bull dams, mating plan of bull dams;
- progeny and performance testing cooperation with breeding associations and organizing the exhibitions.

Bull semen is produced in two insemination centres:

- Ptuj together with Murska Sobota for the Simmental breed;
- Preska near Ljubljana for Brown, Black and White and beef breeds;

Performance testing is organized on two locations:

- Nova Gorica for Brown, Black and White and beef breeds;
- Murska Sobota for the Simmental breed;

Progeny testing for growth and carcass traits is organized on test stations in:

- Rogoza for the Simmental breed;
- Logatec for the Brown breed.

Cattle breeder organizations

The main tasks of cattle breeder organizations are:

- participation in forming the prices, State reimbursements and stimulations;
- cooperation with the Cattle Breeding Service in forming the breeding goals and selection programmes;
- organization of the market for breeding animals together with regional agricultural institutions;
- organization of animal exhibitions together with regional agricultural institutions;
- feedback and control of activities of the Advisory Service.

Cattle breeder associations of Slovenia

In Slovenia exist the following breeder associations for:

- Simmental breed;
- Brown breed;
- Black and White breed; and
- Meat breeds and meat production.

Cattle breeding associations are the following:

- local; and
- district.

Breeders

- 69 000 cows in milk recording; number of breeders 6 400;
- 199 000 tagged and registered cows;
- 122 000 dairy cows;
- 78 000 suckler cows;
- 200 000 cows and pregnant heifers inseminated; number of breeders 60 000;
- 225 000 cows and pregnant heifers; number of breeders 64 000.

Cow milk recording

The first breeders' association that began with milk recording in Slovenia was founded in 1909. Since 1986 Slovenia has been a fully authorized member of ICAR and INTERBULL. In Slovenia milk recording is performed according to the A4 Method, once a month for all milkings on the control day. The allowed interval between two recordings is 22 to 37 days. Every year at least 11 recordings must be taken per herd. Lactation calculation is made according to the number 2 Method (Test Interval Method), approved by ICAR.

Table 6. Number and portions of milk recorded cows.

Year of recording	Total no. of cows	No. of dairy cows	No. of suckler cows	No. of milk recorded cows	Percent of milk recorded cows of dairy cows	Percent of milk recorded cows of all
1980	226 036	146 726	79 310	45 290	30.9	20.0
1990	220 266	161 992	58 274	58 124	35.9	26.4
1995	207 318	132 532	74 786	65 837	49.7	31.7
1997	204 969	128 245	76 724	66 180	51.6	32.3
1999	200 000	125 788	74 212	69 199	55 0	34.6

Table 7. Average milk production per cow in years 1991 to 1999 in standard lactation (305 days).

Breed	Year	No. of milk recorded cows	Milk kg	Fat kg	Protein kg	Fat	Protein
Simmental	1991	30 190	3 553	135.0	115.0	3.80	3.23
	1999	29 334	4 340	182.2	145.7	4.20	3.36
Brown	1991	18 393	4 011	153.0	129.0	3.80	3.21
	1999	16 002	4 840	200.7	160.8	4.15	3.32
Black and White	1991	13 359	5 555	205.0	173.0	3.69	3.12
	1999	19 072	6 495	261.8	211.7	4.03	3.26
All breeds	1991	63 554	4 131	156.0	130.0	3.77	3.16
	1997	65 635	5 100	210.3	168.9	4.12	3.31

Structural changes and specialisation after the introduction of EU Regulations for quality of milk are the reasons for the rapid increase of milk yield in recorded cows, as well as for better milk content.

Organization and financing of milk recording

The milk recording service in Slovenia is organized and financed by the Ministry of Agriculture, Forestry and Food. The Cattle Service of Slovenia consists of a central service (Agricultural Institute and Biotechnical Faculty) and six regional centres (Murska Sobota, Ptuj, Celje, Kranj, Ljubljana and Nova Gorica).

Six laboratories analyse milk and belong to six regional centres. Laboratories have MILKOSCANS (diverse capacity). Some laboratories have FOSOMATIC for somatic cell counts. The mentioned six laboratories and other laboratories that analyse milk for dairies are part of the network for milk sample exchange. The laboratory of the Institute for Dairying that is part of the Biotechnical Faculty, the Zootechnical Department (BF), is a referral laboratory. The laboratory of the BF Institute for Dairying is included in the international network for assessment of results because Slovenia is a member of the ICAR Reference Laboratory Network led by Mr Oliver Leray. Slovenia exchanges results with referral laboratories in Europe (Denmark, France and Germany). All laboratories in Slovenia are included in the national ring test and are calibrated with the referral laboratory of the Institute for Dairying.

Table 8 shows the average number of cows per milk recorded herd in each regional centre. Smaller herds are in the eastern part of Slovenia where milk production has been omitted due to pig production and in the western part of Slovenia (Primorska) where farming has been omitted owing to aggravated production conditions. Young people leave this mountain and carst region and only elders remain.

Table 8. Average number of cows per milk recorded herd referring to sector and controller in 1997.

	Cow: herd ratio			No. of all	Average no.
Regional centre	Family farms	Farm	Total	controllers	cows per control
Murska Sobota	5.6	-	5.6	29	355
Ptuj	7.8	113	8.0	48	256
Celje	11.4	149	11.9	44	272
Kranj	15.3	177	18.1	18	344
Ljubljana	8.3	371	10.0	66	282
Nova Gorica	6.2	195	7.3	32	199
Total	8.0	234	8.8	237	277

Milk recording is financed by the Government for the time being. In Slovenia about 240 controllers and about 20 senior controllers who are responsible for milk recording and selection, registration and identification and pedigree data keeping in our herds are employed.

The average cost of milk recording per cow equals 180 kg of milk per year. The expenses are paid by the Government. Breeders in the future would like to have other traits measured, like somatic cell count, contents of urea in milk, nutrition and economic data and other prints within milk recording services but they should pay a part of the costs. The Government will not be able to cover all milk recording costs in the future. Therefore, financial resources for milk recording and animal registration should be used rationally. Serious considerations have already been started in connection to the AT method, reduction of laboratories for determination of milk traits and quality of milk and restructuring of control services for milk recording and data processing.

Quality assurance and Slovene dairy laboratories

There are presently fifteen laboratories dealing with quality estimation in Slovenia. Six of them are from milk recording services of Slovenia, others from dairies. The national referral laboratory in charge of harmonisation of methods and procedures with national laboratories of other countries and members of international associations will be appointed.

The Laboratory of the Institute for Dairying at the Zootechnical Department of the Biotechnical Faculty is presently in charge of such activities. The laboratory organizes inter-laboratory comparative tests for precision control of results, obtained by instrumental methods and also prepares reference material. It is a member of INTERLAB and is involved in the international laboratory control of precision of milk and dairy product analyses, organized by MUVA, Kempten, Germany, CECALAIT, Poligny, France, as well as the BACTOSCAN MILKSTANDARD Service, Wangen, Germany. In this way the laboratory practically takes part in organizing the European network of dairy laboratories (Golc, 1998).

Milk recording by sheep

In Slovenia milk recording is performed according to the ICAR A4 method and is performed by the National Sheep and Goat Breeding Service (SGBS). At State level, the herd book, database, data input, lactation calculation and evaluation of other traits are performed by the SGBS at the Biotechnical Faculty, Zootechnical Department. The milk yield of sheep and goats is calculated on the basis of monthly recordings and milk analysis. About 15 percent of the dairy breed population of sheep and goats is included in milk recording in Slovenia.

Animal identification in Slovenia

Identification and tagging of individual animals has traditionally been inspired by and initiated to facilitate animal breeding. With the intensification of production and increased trade of live animals, animal health and safety of products for human consumption became an increasingly important issue and identification of animals in trade, a device to control spread of diseases and to facilitate hormone and residue control. Lastly, with the increasingly complex marketing of food products, animal identification is becoming an expedient in marketing of meat and meat products at all levels: the farmer to market his products via trade marks and the Government to control production and the market throughout the State.

Slovenia is a country seeking membership in the European Union. Accession negotiations between the European Union and Slovenia started in 1998 and Slovenia has since been intensively adapting legislation to meet EU standards. Animal identification (particularly cattle identification) is defined in great detail by European and accordingly, also Slovenian legislation.

Cattle identification

The population of cattle in Slovenia is 491 600 (SUBS, VI / 99) and is slightly increasing. The average herd size is small (8.9 animals), mainly due to a large number of very small herds. In 1999 46 percent of herds consisted of four animals or less and 25 percent consisted of one or two animals. Nevertheless, the size distribution is rapidly changing. The proportion of herds containing one or two animals dropped from 29.4 percent in 1988 to 24.7 in 1999 and the proportion of herds of 50 animals or more rose from 0.6 in to 0.9 percent.

Two systems for identification and movement tracing were established and ran in the past: the identification system implemented by the breeding service and the tracing system implemented by the veterinary authority. The breeding service system has traditionally tagged all cattle in the recording scheme. The animals received uniform lifetime identification within one to three months after birth. In the last years, eligibility for Government premiums for animals required the animals to be tagged and the breeding service has tagged the animals due for any premiums. *In 1999 an estimated 60 percent of animals was tagged by the breeding service*.

The veterinary system is aimed at recording animal movements. Every movement between locations has to be registered by law. In the old situation, if an untagged animal was to be moved, it was tagged before the transfer. All animal movements were recorded in a central database. The two systems were therefore complementary, but they maintained separate computerised central databases.

The Slovenian Regulation on cattle identification and registration, put into force in 1999, made provisions for the national cattle identification and tracing system as defined by the EU Regulation 820/97. The Service for Identification and Registration ("SIR"), a body at the Ministry of Agriculture, Forestry and Food, is responsible for fully implementing the Regulation in the years 2000-2002. Five employees of the service, with the assistance of the field zootechnicians and veterinarians have the task of transforming and upgrading two existing separate identification systems into a single, EEC 820/97 compliant system.

The system is designed to rely on cattle keepers, field veterinarians, field zootechnicians and SIR, the central service. The keeper, who is ultimately responsible for registering births and movements of animals, tags the animals and keeps the register of animals on the holding. If the keeper needs help he can call the field commissioner who assists the keepers with tagging, keeping required records, registration of births and movements and also enters the data into the central database.

Sheep and goat identification

Sheep and goat population, almost non-existent before 1990, is rapidly increasing. In 1999 there were 70 000 sheep and 15 000 goats in Slovenia, flock sizes averaging 25 for sheep and 15 for goats.

Individual tagging of all sheep and goats is not obligatory, as is the case in cattle. Sheep and goat identification is regulated by zootechnical regulations requiring breeding animals to be individually tagged and by veterinary regulations, requiring animals in trade to be tagged, either individually or as a group.

Similarly to cattle, two tagging systems are in operation in sheep and goats. The veterinary system controls the animals in trade by issuing health certificates before animals are moved to a different location. Untagged animals receive a single >>group tag<< which is recorded on the health certificate but is not physically attached to the animal.

Certain categories of animals must be individually identified. First, all animals in flocks in the recording scheme must be individually tagged. In these flocks, breeders do not have a choice to tag selected animals; all lambs and kids must be tagged within a few days after birth. Next, all flocks included in the gene conservation programme are obliged to tag all their animals. Eligibility for any type of State animal premiums requires the animals to be tagged and registered. Finally, damages due to wild animal attacks are reimbursed only for tagged and registered animals.

Conclusions

- In the period of transition, 1990-1999, Slovenia managed to maintain the number of cows and milk production and breeding and milk recording services on almost the same level as before the transition. Milk production has been increasing since 1993 and there are some milk surpluses.
- Market demands and new regulations on EU quality of milk introduced in 1993 caused the decrease of family farms and State farms with market production of milk by 50 percent.
- The composition of milk (fat and proteins) and especially microbiological quality has since 1993 obviously been improved and reached the EU level.
- Family farms that keep market production of milk have improved technologies, genetic potential of animals and productivity of cows and productivity of work.
- The number of cows per family farm with market milk production has been slowly increasing (on 6.1 cows / farm in year 1998).
- Amounts of purchased milk per cow increased on family farms by 1 050 litres and on State farms by about 730 litres in the period 1990 to 1998.
- The Government contributes to the above changes by financing extension services, milk recording and selection services and by price policy and subsidies.
- The problem is the lack of attractive loans for more rapid changes of farm size and modernisation of milk production and modernisation of laboratories.

References

Cattle Sheep and Goats Breeding in Slovenia. Publication for the 32nd ICAR Session,14-19 May, Bled. Published by the University of Ljubljana, May 2000.

Cattle Bells. Publication for the 32nd ICAR Session, 14-19 May, Bled. Published by the University of Ljubljana, May 2000.

Statistical Yearbook of Slovenia. 1980, 1985, 1990, 1997, 1998, 1999.

Klopcic, M. & Habe, F. Extension Service and Quality of Milk in Slovenia. Workshop: "Extension Services for Quality Milk Production", Berlin, 22-25 January 1999.

Animal identification and recording in Croatia

A. Kljujev, K. Sinkovic & M. Ernoic

Croatian Livestock Selection Centre, Kaciceva 9/III, 10000 Zagreb, Croatia

Introduction

The Republic of Croatia has about 4.8 million inhabitants and has a surface area of 56 691 km^2. The agricultural land covers 3.18 million ha; 2.2 million ha are cultivable land and 1.13 million ha are pasture. There are three distinct agro-ecological regions: Pannonia, the mountain zone and the Mediterranean. Private family farms (534 000) dominate the livestock production, but in general, they are characterised by their small size (2.8 ha), high level of land fragmentation and lack of specialisation.

Total number of farm animals is:

Farm animal	1997	1998	1999
Cattle	451 000	443 000	438 000
Pigs	1 176 000	1 166 000	1 362 000
Sheep	453 000	427 000	488 000
Poultry	10 945 000	9 959 000	10 871 000

Production of milk and meat includes:

Livestock production	1996	1997	1998
Milk, million litres	593	621	633
cattle, 000 t.	62	54	54
pigs, 000 t	163	166	184
sheep, 000 t	6	7	9
poultry, 000 t	69	85	99

Organization of animal recording

Hrvatski stocarsko selekcijski centar, the Croatian Livestock Selection Centre (CLSC) is an institution which has the leading role in selection and animal breeding.

The "Union of Croatian Cattle Breeding Cooperatives" was established in 1913 which was considered to be the year to mark the beginning of organized selection work in Croatia. Today, the Croatian Livestock Selection Centre is considered as a Government institution.

The CLSC is acting throughout the Republic of Croatia and today it has 201 employees. The main executive organization forms 27 district units which are in charge of data and milk sample collection and all other selection work in the field.

The system of funding is 60 percent by the Government and 40 percent is from fees and paid services. The costs of milk recording paid by the breeders per cow are equal to 30 kg of milk per year.

The main activities of the Croatian Livestock Selection Centre are:

- collecting data in a central database of registered livestock of farm animals;
- cattle identification and issue of documents of parentage (pedigree);
- planning and carrying out of breeding programmes;
- milk recording and breeding value estimation for registered animals;
- participation in the management of genetic resources (conservation of endangered breeds);
- cooperation with national and international scientific and other institutions; and
- organization of cattle exhibitions, reviews and auctions.

Breeder associations

There are many mixed types of regional farmer associations in Croatia. Recently, breeders have started with association establishment on species and breed level supported by the CLSC.

The tendency is that the regional breeders' association will be incorporated into the national breeders' association. They will be incorporated into the top breeders' association, according to the species, as such they will collaborate with international breeder associations.

The number of animals being recorded in 1999 and the recent trend are reported in figure 1

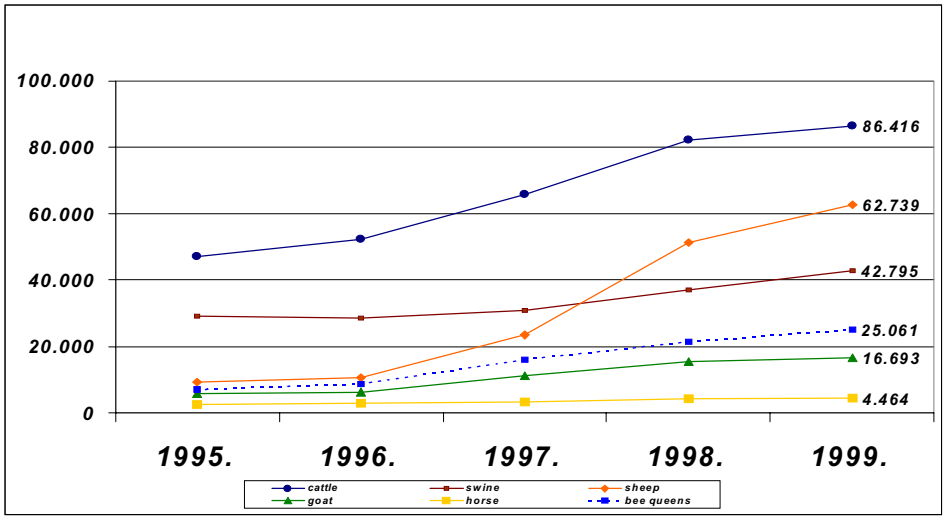


Figure 1. The number of animals being recorded from 1995 to 1999.

In recent years we can see that the number of all animals recorded has increased. About 27 180 family farms and enterprises were recorded in 1999.

Total number and number of cows being recorded is:

Year	Total number of cows	Number of cows being recording
1995	235 400	47 144
1996	233 477	52 397
1997	233 207	65 807
1998	230 650	82 145
1999	228 014	86 416

In recent years the total number of cows has decreased but not significantly but the number of registered cows has increased.

The number of cows being milked

Due too small herd sizes, some cows are not included in milk recording. They can still be recorded regarding parentage and registered calves.

Family farms

Breeds	Milk recording		Parentage recording		Total	
	Breeders	Cows	Breeders	Cows	Breeders	Cows
Simmental	5 617	30 150	13 135	34 664	18 752	64 814
Holstein Friesian	665	6 131	1 161	4 163	1 826	10 294
Brown	84	397	2.052	4 442	2 136	4 839
Istrian cattle			65	133	65	133
Hereford			2	13	2	13
Charolais			3	105	3	105
Grand total:	6 366	36 678	16 418	43 520	22 784	80 198
Percentage	27.94	45.73	72.06	54.27	100	100
Average		5.76		2.65		3.52

The average number of cows with milk recording per breeder in family farms is 5.76 cows. The average size of parentage controlled herds is only 2.65 cows.

Enterprises

Breeds	Milk recording		Parentage recording		Total	
	No. enterp.	Cows	No. enterp.	Cows	No. enterp.	Cows
Simmental	6	328	1	67	7	395
Holstein Friesian	19	5 644			16	5 644
Slavon.syrm.podolian catt.			1	27	1	27
Hereford			1	124	1	124
Charolais			1	28	1	28
Grand total:	21	5 972	4	246	25	6 218
Percentage		96.04		3.96		100
Average		284.4		61.5		248.7

The average number of cows being milk recorded per enterprise is 284.4 cows and only 61.5 cows for parentage controlled herds.

The number of breeders in relation to herd size

Out of 22 784 breeders with cows being recorded, 14 106 (61.91 percent) have one to three cows. Only 1 075 (4.72 percent) breeders have ten and more cows. The situation in 1999 has improved in relation to previous years, but not significantly.

Number of bulls by breed in centres for AI

The total number of bulls is 144. In the centres for artificial insemination there are 80 bulls and in natural mating there are 64 bulls. For the Simmental and Holstein Friesian breed, 68.57 percent are AI bulls.

Analyses of milk samples

The number of analysed milk samples in 1999 was 291 304 (milk fat, proteins, lactose, non-fat dry matter and total dry matter). Analyses are made on Milcoscan 4400, with a capacity of 400 samples per hour. To fulfil the criteria for the special ICAR stamp, efforts have been made to establish a neutral laboratory, which is to be supervised by the relevant laboratory.

Production in 305 day lactation by breed is the following:

A) Family farms

Breed	Total record. lactations	Production in 305 – day lactation No. calc. lactation	Milk, kg	Fat, kg	Fat, %	Protein, kg	Protein, %
Simmental	27 416	25 914	4 108	161	3.93	135	3.27
Holstein Friesian	4 399	4 168	5 463	210	3.84	175	3.20
Brown	70	68	4 230	168	3.99	134	3.17
All breeds	31 885	30 150	4 295	168	3.91	141	3.26

On family farms 86 percent of cows being milk recorded are recorded by the AT method. Control assistants, according to the monthly programme, have to be present at milking, to measure milk quantity as well as to take samples of each cow following official instructions. The work of control assistants is supervised by super-controllers.

B) Enterprises

Breed / Lactation	Total record. lactation	Production in 305 – day lactation No. calc. lactation	Milk, kg	Fat, kg	Fat, %
Simmental	175	167	4364	157	3.61
Holstein Friesian	3 120	3 002	6 112	215	3.52
All breeds	3 295	3 169	6 020	212	3.52

On enterprises (former State farms) 14 percent of cows being milk recorded are recorded by the B method and milk samples are analysed in local dairies.

Production in 305 day lactation for Simmental breed from 1970 to 1999 is reported in figure 2.

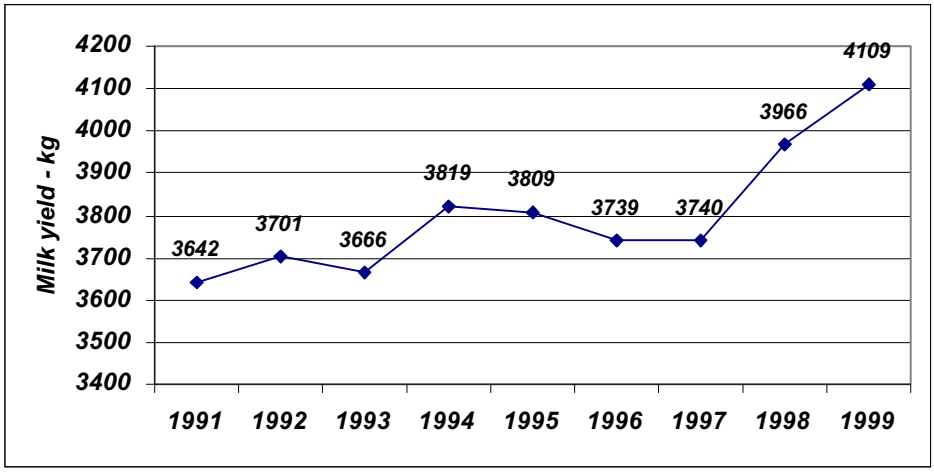


Figure 2. Production in 305 day lactation for Simmental breed from 1970 to 1999

In 1999 the number of calculated standard lactations was 26 081 which is four times (19 508) more than in 1991 (6 573). In the same period the average of milk yield per lactation increased by 12.8 percent (467 kg).

Cattle identification

Cattle identification is the basis for the breeding of cattle. Cattle are marked in two ways: permanently (tattoos) and by eartagging. A unique life-time identification number consists of eight digits: the first two represent the district and breed code and the other six represent the current number of each animal. The current number without sign of district and breed code is tattooed on the right ear and the number of sire is tattooed on the left ear.

The recommended yellow plastic eartag is used.

According to an EU regulation, this year we will start cattle identification by using two plastic eartags and we expect that controllers will start to register all calves.

All calves being recorded are recorded in the registration and breeding book no later than 30 days after birth.

For better data transmission and processing, our tendency is to connect the central database with district units by modem/internet connection. This will give us the possibility to return information back to breeders much earlier.

Sheep breeding

The number of registered sheep breeders in 1999 was 782, with 62 739 sheep being recorded.
The size of registered sheep herds during 1999 was:

- 31 percent less than 25;
- 28 percent from 26-50 sheep per herd;
- 29 percent from 51-100 sheep per herd;
- 12 percent had more than 100 sheep in the herd.

We have 17 sheep breeds being recorded. The most important are our autochthonous sheep breeds Istarska, Creska, Paška, Licka and Dubrovacka ruda.

The structure of sheep breeds being recorded was as follows:

- 87 percent meat sheep breeds;
- 13 percent milking sheep.

During 1999 the milk production control began for the East Friesian and Paška breed.

Breeding	Breed	No. of lactation	Av. dur. of lact. day	Milk (kg)	Fat (%)	Protein (%)
Intensive	East Friesian	87	240.07	213.63	7.36	6.11
Semi-extensive	Paška	263	182.15	114.85	8.15	7.06

Goat breeding

The number of registered goat breeders in 1999 was 373 with 16 693 goats being selected.

The size of registered goat herds during 1999 was:

- 49 percent smaller than 25 goats per herd;
- 26 percent from 26-50 goats per herd;
- 18 percent from 51-100 goats per herd;
- 7 percent had more than 100 goats per herd.

Over viewing the breed structure of registered goats, one can see that milking goats like French Alpine, Saanen and Bunte Deutsche Edelzige (BDEZ) are the most frequent breeds.

During 1999 milk production control began in the French Alpine, Saanen and BDEZ breeds.

Results were as follows:

Breed	No. of lactation	Av. dur. of lact. day	Milk (kg)	Fat (%)	Protein (%)
French Alpine	780	263.78	432.10	4.21	3.69
Saanen breed	139	267.94	521.79	3.94	3.39
BDEZ	187	214.22	394.48	3.92	3.73

References

Croatian Livestock Selection Centre; Annual Report for 1999.

Ministry of Agriculture and Forestry; A Strategy for Sustainable Agricultural Development.

Statistical Information 1999.

The role of the State and breeder associations in animal identification and animal recording in Poland

D. Krencik & Z. Kossowski

Central Animal Breeding Office, ul. Sokolowska 3, 01-142 Warsaw, Poland

Summary

Milk and beef production play a very important role in Polish agriculture but the number of cows dropped dramatically in the early 1990s due to liquidation and bankruptcy of big State farms, both due to social and financial reasons. About 95 percent of cows are kept on private farms. Only 11.1 percent of cows are milk recorded (MR). A huge number of herds maintaining cows and the herd structure hamper the increase of milk recording. At present, a governmental organization, the Central Animal Breeding Office (CABO), is responsible for milk and animal recording, herd book-keeping, insemination, breeding data processing and breeding value estimation. The role of the cattle breeder associations is however, growing year by year and in the near future, they should be responsible for most of the activities connected with breeding, which means, for the breeding programme itself, herd book keeping and animal recording.

Introduction

Milk and beef production play a very important role in Polish agriculture. Table 1 presents the changes in production during the last years

Table 1. Beef and milk production.

Specification	1990	1995	1998
Beef production (in thous. t)	793	373	420
Veal production (in thous. t)	63	46	53
Milk production (in million l)	15 371	11 303	12 229

During the last years the number of cattle and cows kept on farms has decreased (Table 2) but the average annual quantity of milk per cow has increased, especially in herds that are milk recorded (Table 3). The number of cows dropped dramatically in Poland in the early 1990s due to liquidation and bankruptcy of the big State farms due both to social and

financial reasons. Additionally, small private farms have also ceased cattle production due to small milk production profitability. The following tables describe this situation and the tendencies.

About 95 percent of cows are kept on private farms. Only 11.1 percent are being milk recorded (MR). The total structure of farms depends on the number of animals being milk recorded (see table 4). Private farmers own about 83 percent of the agricultural land. The distribution of private farms across different farm sizes is presented in table 5.

Table 2. Cattle population (in thousands heads).

Specification	1990	1995	1999
Cattle in total	10 049	7 306	6 555
of which cows	4 919	3 579	3 418
Cattle on private farms	8 320	6 742	6 150
of which cows	4 362	3 378	3 257

Table 3. Average production per cow.

Specification	1990	1995	1998	1999
Cow population (in thousands heads)	4 919	3 579	3 542	3 418
Average milk yield	3 151	3 136	3 491	
Cows under MR (in thousands heads)	620.0	342.0	380.6	379.1
Milk kg	4 131	4 287	4 862	5 027
Fat kg	167	173	200	207
Fat %	4.04	4.03	4.12	4.12
Protein kg	-	140	160	165
Protein %	-	3.26	3.29	3.28

Table 4. Herd structure.

Number of cows	In total	Under MR
Less then 5 cows	58.6	6.7
5-9	23.5	36.1
10-19	13.9	41.9
20-49	2.8	8.2
50 cows and more	1.2	7.1

Table 5. Private farms.

Specification	1990	1995	1998
Farms (in thousands)	2 138	2 048	1 989
in percent of agricultural land area:			
1.01-1.99 ha	17.7	20.9	22.6
2.00-9.99 ha	64.9	61.7	60.3
10.00-14.99 ha	11.3	10.7	10.2
15.00 ha and more	6.1	6.7	6.9
Average total farm area in ha	7.1	7.6	7.7

The large number of herd keeping cows and the herd structure makes it difficult to increase the milk recording. We expect that the increasing demand requirements for milk quality, which the Polish regulations and the dairy plants have started to exercise, will hardly be met on small farms. Most of these farms will stop milk production although some of them could produce special regional products like '*oscypek*' in the mountain region. The above-mentioned requirements will also force the farmers to inspect their cows more closely and to enrol the milk recording. We can already observe such a situation in regions where the dairy plants are well-established, have very strict requirements but also pay adequate prices for good quality milk.

Organization of animal and milk recording

At present, the Central Animal Breeding Office (CABO), through its branches (six Regional Animal Breeding Offices with Milk Laboratories and four Regional Insemination Stations), is responsible for milk and animal recording, herd book keeping, insemination, breeding data processing and breeding value estimation. It controls issues related to breeding dairy and beef cattle, pigs, poultry, fur animals and bees. CABO is a governmental institution that is 50 percent self-financed. According to the new Breeding Law, CABO will give away some of its tasks, in the near future. Regional Insemination Stations will first be restructured and then privatised and breeder associations will be responsible for herd book keeping and animal recording.

CABO has represented Polish breeding in ICAR and Interbull since 1994, when Poland joined these organizations.

Our reference milk laboratory (CLOM), which prepares standards for other laboratories in our laboratory network, is a member of CECALIAT. At least four times a year CLOM participates in the interlaboratory proficiency study with good results. A few years ago CLOM received the accreditation of the Comite Français d'Acreditation for reference milk testing methods. On the basis of this laboratory we are building the network of seven

accredited laboratories and we expect the accreditation of all of them to be completed by June 2001.

Every milk sample is evaluated for fat and protein content and number of somatic cell count (SCC).

The number of State subsidies for animal production, including cow milk recording, decreases annually and farmers have to pay bigger fees for this service. It has caused changes in the methods of cow evaluation. Until the end of 1996 cows were evaluated using only the A4 method. In 1997 we also started evaluation with the A8 and AT4 methods because they are less expensive than the previous one. At the end of 1999 51.3 percent of cows were recorded with the A4 method, 15.1 percent with AT4 and 33.6 percent with A8.

Animal identification and registration

The system for identification and registration of breeding cattle has existed in Poland for more then 20 years. Every cow being milk recorded receives a unique lifetime number, which is used in milk recording, herd books and insemination. Plastic eartags are used for identification. All the herds involved in the milk recording have their unique numbers, too. Even when a farmer has decided to stop cow evaluation, this herd number is still attached to the herd. All the information about animal and herd numbers is kept in one central database.

According to the new Veterinary Law, veterinarians are responsible for the national system of cattle identification and registration (I&R), but executive regulations are still missing. We hope that the new I&R system will fit the breeding reality (for example the number should be unique for at least three cow generations) and we will be able to introduce it as well. We will have to keep an additional identification system for cattle breeding.

Breeder associations

In Poland, we have different kinds of breeder associations depending on species and types of use. The farmers in Poland keep mostly dairy and dual purpose cattle. Beef cattle are kept in small beef herds thus, one national association suffices the beef cattle breeders (National Association of Beef Cattle Breeders).

Breeders of dairy and dual purpose cattle have 18 regional associations which are federated in one national Polish Federation of Cattle Breeders.

The role of cattle breeder associations is growing year by year. At present the breeders have their representatives in different advisory bodies to governmental organizations. It means that they of course, have some influence on the breeding programmes but they have no influence on managing it and very little influence on financing the organization of a programme. The idea is that the breeders will be responsible for the

breeding itself. In the future, maybe even in the very near future, they should be responsible for most of the activities connected with breeding, which means for the breeding programme itself, herd book keeping and animal recording. This process may however, prove to be very slow because for some 40 years they have relied on decisions taken for them.

Conclusion

The large number of farms in Poland and their structure have resulted in only a small proportion of the dairy farms and cows being milk recorded. The project of the dairy sector restructurisation, which predicts that milk is produced in only the bigger herds, to more easily meet the milk quality requirements, together with the subjection of milk price to SCC, should stimulate the increase of the milk recording spread. This phenomenon has already been observed in the areas of powerful dairy plants, which pay a good price for good quality milk.

For more then forty years the Governmental authorities of Poland have decided the breeding regulations, thus, causing farmer organizations to loose the need to take decisions for themselves. They would, however, like to take responsibility for breeding but they need some support in preparing the regulations for milk recording and running the breeding programme, etc., to do it correctly. In our opinion ICAR and other independent international bodies could help them. ICAR could, for example, help them in the recommendations on how to update the identification system, milk recording, lactation extension, etc. We are also waiting for the promised regulations required in order to receive the ICAR Special Stamp.

Résumé français

Role de l'Etat et des organisations d'eleveurs dans l'identification et le controle de la production animale en Pologne.

La production de lait et de viande bovine joue un role important dans l'agriculture polonaise quoique l'effectif de vaches aie violemment diminue dans les annees quatre-vingt dix a cause de la liquidation et la faillite de grands etablissement agricoles d'etat provoquees par des facteurs sociales et economiques**.** Environ 95 pour cent des vaches sont exploites dans les fermes privees. Seulement 11.1 pour cent sont sous controle de la production laitiere. Le grand nombre de troupeaux de vaches ainsi que la structure de cheptel rendent difficile l'elargissement du controle de la production laitiere. Actuellement, un organisme gouvernemental - Station Centrale de l'Elevage d'Animaux (SCEA) est responsable du controle de la production animale, des inscriptions aux livres genealogiques, de l'insemination, de la transformation des donnees et de l'estimation de la valeur genetique. Cependant le role des associations d'eleveurs des bovins accroit d'une annee a l'autre et dans un proche avenir elles seront responsables de la majorite des activites liees a l'elevage c'est-a-dire du programe d'elevage lui-meme, des inscriptions aux livres genealogiques et du controle de production animale.

Zusammenfassung

Die Bedeutung der staatlichen und Tierzuchtorganisationen in die Tieridentifizierung und Tierdatensammlung in Polen

Milch und Fleischproduktionen spielen in der polnischen Landwirtschaft eine sehr wichtige Rolle. Die Kuhanzahl hat sehr stark abgeno. im Zusammenhang mit der Auflösung vieler staatlichen landwirtschaftlichen Betrieben. Ungefähr 95% des Kuhe bestandes gehört zu privaten Betrieben. Nur 11.1 % davon stehen unter Milchleistung. Die groβe Herdenanzahl und die Herdenstruktur erschweren die Zuchtarbeit. Zur Zeit die staatliche Organisation, d.k. die Zentrale Zuchtstation ist für Milch und Datensammlung, Besammung, Zuchtdataien, Herdbücher, Zuchtwertschätzung und Dateverarbeitung verantwortlich. Die Rolle der Zuchtorganisationen, die für verschiedene Angelegenheiten verantwortlich werden wird immer gröβer. Damit wird allem die Führung des Zuchtprogramms, Herdbücher, Leistungsdaten gedacht.

Animal identification and performance recording in Azerbaijian

E. Latifova

Livestock Selection and Pasture Department, Ministry of Agriculture,
40 Uz. Haiibevou str., 370016 Baku, Azerbaijian

Introduction

Azerbaijan is situated at the intersection of Europe and Asia. It has a surface area of 86.4 thousand km² and a population of eight million. The country gained independence in 1991. Before that, it was a part of the Soviet Union.

Cattle breeding in the Republic of Azerbaijan has always been the most important area of the economy.

At the end of the 1920s during the stabilisation of the social economy, cattle belonging to peasants were taken from them and given to kolkhoz and sovkhoz. After the collapse of the USSR kolkhoz and sovkhoz began to be replaced by the private sector.

Only a small portion of animals, one percent of cattle and 0.8 percent of sheep and goats remain as State property, while the rest have been privatised. Since the reform the number of animals has increased.

Table 1. Trends and recent changes in the total number of farm animals in Azerbaijan (in thousands heads).

	Years					
Category	1995	1996	1997	1998	1999	2000
Cattle	1 681.7	1 779.9	1 843.5	1 896.5	1 909.8	1 938.7
Including Buffaloes	291.9	298.0	302.0	293.3	288.8	280.0
Total number of dairy cows	619.6	644.6	691.8	727.4	760.0	780.0
Sheep and goats	4 644.4	4 922.0	5 257.0	5 411.2	5 551.9	5 617.5
Pigs	30.4	23.4	21.0	23.4	26.1	21.0
Poultries	13.3	13.5	12.4	12.5	12.4	12.6

Table 2. Trends and recent changes in milk and meat production in Azerbaijan.

		Years					
Category	Unit	1995	1996	1997	1998	1999	2000
Milk	Thuds ton	826.5	843.3	881.2	923.8	949.5	991.0
Meat (live weight)	Thuds ton	135.0	150.8	158.8	168.3	179.3	187.5
Wool	Thuds ton	8.0	9.1	9.5	9.9	10.3	11.0
Eggs	Mill	455.0	477.0	491.6	507.2	509.0	525.8

1 ton = 1 000 kg

During this period the production of meat, milk and wool increased (Table 2).

The total value of animal products has reached 405 milliard manats (1 US$ = 4 400 manats) and 46.1 percent of it is at the expense of cattle breeding. In 1983 this index was 30 percent. There is a retail trade of meat in cities, villages and streets which confirms this factor. In the better years of Soviet rule, the free retail trade of meat was considered to be rare. Now there is no problem in this field, but we have many other problems

Number of cows being milk recorded

We only have registration programme data on dairy cows, but data on milk recording are not available.

The farming structure in Azerbaijan consists of 33 thousand peasant/farmer housekeepings. Experience showed that keeping a small number of animals is not efficient. Therefore, in recent years, the establishment of housing has begun and herd sizes have increased.

Breeder associations

There are no breeder associations in Azerbaijan.

Who is providing support services to animal breeders?

A governmental institution and private organizations provide support services to animal breeders.

A governmental institution

The Central Board of Animals, Selection and Pasture of the Ministry of Agriculture and the Republic, Scientific Production Amalgamate of Azerbaijan, provide advisory services for animals to animal breeders. Different private organizations and international projects give credit to animal breeders.

Organization of animal and/or milk recording

The full official name of the organization in charge of milk recording in Azerbaijan is the Statistical Committee of Azerbaijan, the legal status of the recording organization is that of a governmental service. Every month farmers and 25 State pedigree organizations fill out forms on cow and buffalo milk production, meat production, number of animals and beef cattle and report to the Regional Statistical offices. The Regional Statistical offices report to the Statistical Committee of Azerbaijan. After which, reports are issued and published monthly and yearly.

Trends and recent changes in the system of payments

The system of funding for recording services is totally paid by the State and the State support is increasing.

Trends and recent changes in the organization of animal and milk recording

Before 1991 the State farms (kolkhoz and sovkhoz) were collected; from 1991 to date, the data of the 25 State pedigree farms and new farmer farms have been collected. Trends and recent changes are:

- decreased number of report indexes;
- many owners do not want to register in order to hide them income;
- all previous laboratories and meat-milk factories stopped their activity after the reform. Due to this reason, the analysis of fat and protein content and bacteriological analysis in Azerbaijan were not carried out. In exceptional cases all analysis are provided by veterinary laboratories (paid by the owners).

Animal identification and registration

Animal production in Azerbaijan is split into two areas, namely breeding and non-breeding, which are developed in different ways. Whilst the breeding area has relatively well developed recording and therefore, also identification and registration infrastructure, the non-breeding area, which includes most private animal owners, has a very low degree of organization. However, this situation is likely to improve as there are substantial structural changes expected, speeding up the organizational activities in the whole of animal production.

For a small country such as Azerbaijan with significant agriculture resources, the most appropriate way of preparing the sector for EU accession is to develop an agricultural system which is competitive on the open market. For such a system, both size and structure, needs to be quite different from the system that existed during the Soviet era. It is essential, therefore, that the policy responds to rural social problems and demands more support from the agricultural sector in order that it takes an appropriate form, namely, focusing on efficiency and competitiveness enhancement and not policies that delay unavoidable changes or maintain or increase distortions.

Methods of identification

The identification and registration systems are used only at State pedigree organizations. Since 1994 due to the financial situation, only old eartags have been applied.

The contemporary conditions of the livestock production in Russia and the role of breeding organization on the course to the market oriented animal husbandry

V. V. Lavrovski & G. V. Rodionov

Moscow Timiriazev Agricultural Academy,
Timiryazevskaya 49, 127550 Moscow, Russia

Situation of animal production in Russia

The gross agricultural product in 1999 was 624,8 Billions Rbl (~ 27 Bil $), among it total plant product was 323,6 Bill. Rbl or 51,8 percent (9 percent increase) and total animal product was 301,2 Billions Rbl or 48,2 percent (3,7 percent decrease).

There is clear evidence of the redistribution of the main plant and animal products between the farms which belong to the different categories of owners. Since 1995 the large scale collective farms continued to loose their positions in favor of individual private farms in production of cereal crops, sugar beat, sunflower seeds and most dramatically in favor of households in production of potato, vegetables, meat and milk. The egg production in collective farms more stable and has a tendency to increase (Table 1).

Table 1. The structure of the main agricultural products in the farms of different possessing categories.

	Collective commercial farms		Household farms		Individual commercial farms	
Items	1995	1999	1995	1999	1995	1999
Cereal crops	94.4	92.0	0.9	0.9	4.7	7.1
Sugar Bean	95.9	93.8	0.6	0.8	3.5	5.4
Sunflower seeds	86.3	86.1	1.4	1.3	12.3	12.6
Potato	9.2	7.0	89.9	92.0	0.9	1.0
Vegetables	25.3	20.9	73.4	77.0	1.3	2.1
Meat (livestock and poultry in live weight)	50.2	38.7	48.2	59.3	1.6	2.0
Milk	57.1	49.1	41.4	49.2	1.5	1.7
Eggs	69.4	70.0	30.2	29.7	0.4	0.3

These tendencies take place without principal changes in ownership structure and agricultural lands distribution. (Table 2).

On the course of the last 5 years the 83,8 percent of all agricultural lands (including 86,9 percent of tillage and 79,3percent of pastures) belong to the large scale collective farms. It means that the animal population density in households is about 9 times higher for cattle, 14 times for cows, 12,5 times for swine and about 40 times for sheep and goats when compared to collective farms. The animal population density in the individual private farms is lower (three times lower for cattle, four times for cows, two times for swine) and only sheep and goats prevail of two times in individual farms in comparison with collective farms. It is clear that households and individual farmers are unable to supply themselves with forage, pasture grasses and hay and have to be supported (legally or illegally) by big collective farms in the form of natural salary (for their own employee), for example, or barter. Actually, without such a formal or informal support from the side of large-scale collective farms, the low-scale production of animal products in newborn individual farms is unprofitable and, therefore, non developed. Insufficient agriculture credit system and unattractive investment climate in agriculture create difficulties not only to individual private farms but for also to large-scale collective enterprises.

Table 2. Distribution of the Farm lands (mill. ha) and livestock (mill. heads) between the farms of different possessing categories in 1999.

Items	All farms	Collective commercial farms	Households	Individual commercial farms
Number of farms		~ 27 000	~ 2 700 000	261 100
Total Agricultural lands, (mill. ha)	195,2	163,5	10,5	13,0
(%)	*100*	*83,8*	*5,4*	*6,6*
Tillage, (mill. ha)	121,6	105,7	4,4	9,8
(%)	*100*	*86,9*	*3,6*	*8,0*
Pastures, (mill. ha)	69,7	55,3	4,8	3,1
(%)	*100*	*79,3*	*6,9*	*4,4*
Cattle, (mill. ha)	27,5	17,4	9,6	0,5
(%)	*100*	*63,2*	*34,9*	*1,8*
Cows, (mill. ha)	12,9	6,9	5,8	0,2
(%)	*100*	*53,4*	*45,0*	*1,6*
Swines, (mill. ha)	18,3	9,9	7,9	0,5
(%)	*100*	*54,1*	*43,2*	*2,7*
Sheeps and Goats (mill. ha)	14,0	4,8	8,4	0,8
(%)	*100*	*34,3*	*60,0*	*5,7*

The main tendencies in total cattle, cows, swine number and total milk and meat production dynamics are presented in figures from 1 to 5.

The total number of farm animals in Russian Federation since 1990 year is still decreasing; the exception might be the relatively stable number of the swine during the last three years in farms of all categories, due to the stabilization of the production in the large-scale collective farms, the so called "industrial complexes". The total swine population in these farms during the last three years could be estimated in 52 000, 104 000 and 208 000, respectively.

Nevertheless, total meat production continues to fall down, because of decreasing number of cattle. The total productivity of households is stable and since 1995 overcoming the productivity of the collective farms. The individual private farms play unnoticeable role in meat production within the country context. After the economical crisis of the August 1998, the imported meat decreased from 35.5 in 1997 to 25.4 in 1999. The meat prices in the same period increased 2.7 times.

Tendencies in the milk production are almost the same; in 1999 both collective farms and households produced the equal quantity of the milk. The mean milk productivity in collective farms in 1999 was 2 283 kg per cow. Increasing role of households in animal production is in the strong relation with low salaries of employees in collective farms. The mean salary per month in collective agricultural farms in 1999 was 612 Roubles (26.5 US$). It's 3 times less then in food processing industry. This conditions are pushing the rural employee to develop their own households, using material resources (forage, transport, energy) of the collective farms.

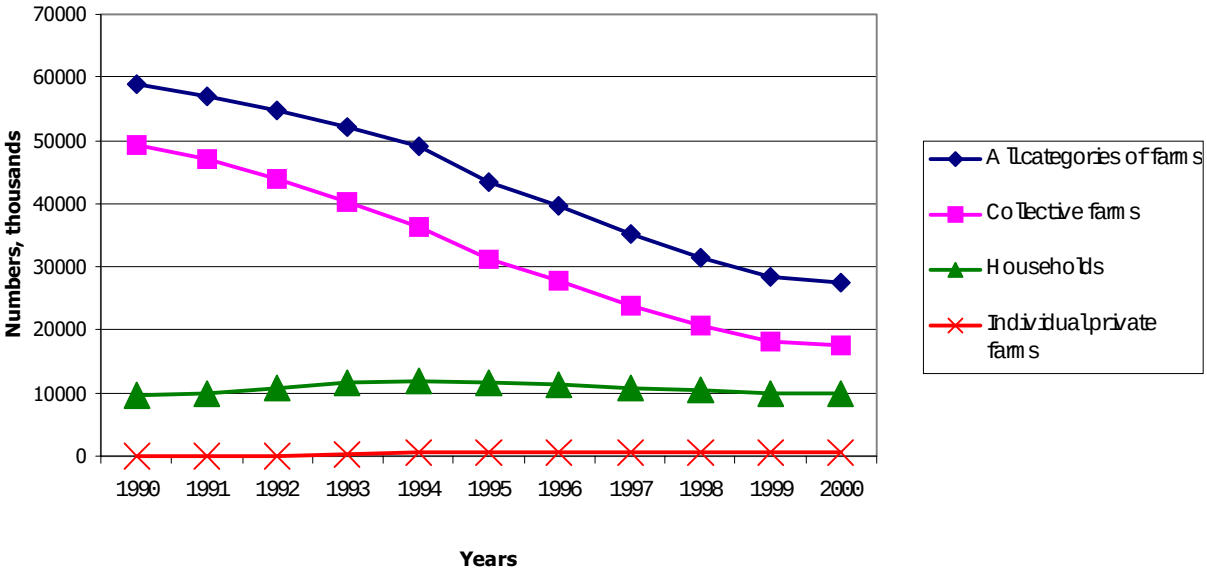


Figure 1. Tendencies of the total cattle number dinamics in the farms of different ownership categories during 1990-2000.

Breeding organizations in Russian Federation

The structure of the Russian Breeding Organizations is still under transition and development because of serious changes of Russian policy and economics. Privatization in agriculture has covered the systems of food processing and trade. But the sphere of production and land possessing utill now are out of serious reform. The gap between semi-socialistic or semi-feudal agricultural production and wild capitalistic food processing and trade without real (financial) state management and control resulted in ugly disproportion of income distribution and appropriation. Enormous size of Russian agriculture, low level of mechanization / automatization and informatization, pure technological culture makes the process of transition and reform inoperable. We can observe single examples of effective breeding organization: in Moscow Region "MOSPLEM" and Leningrad "AIRCHER" Region, but, as a rule, the farm managers prefer informal temporary unions and connections to solve the present day problems.

The Animal Breeding in Russia is subordinated to the State Law "On Animal Breeding" and special regulations.

In the head of livestock production and breeding in Russian Federation is the Department of Animal Production and Breeding Practice of the Russian Ministry of Agriculture and Food[1]. There are Divisions of Animal Breeding practice and Breeding Inspection, responsible for organization of animal breeding in the Regions. The separate breeding specialists are included

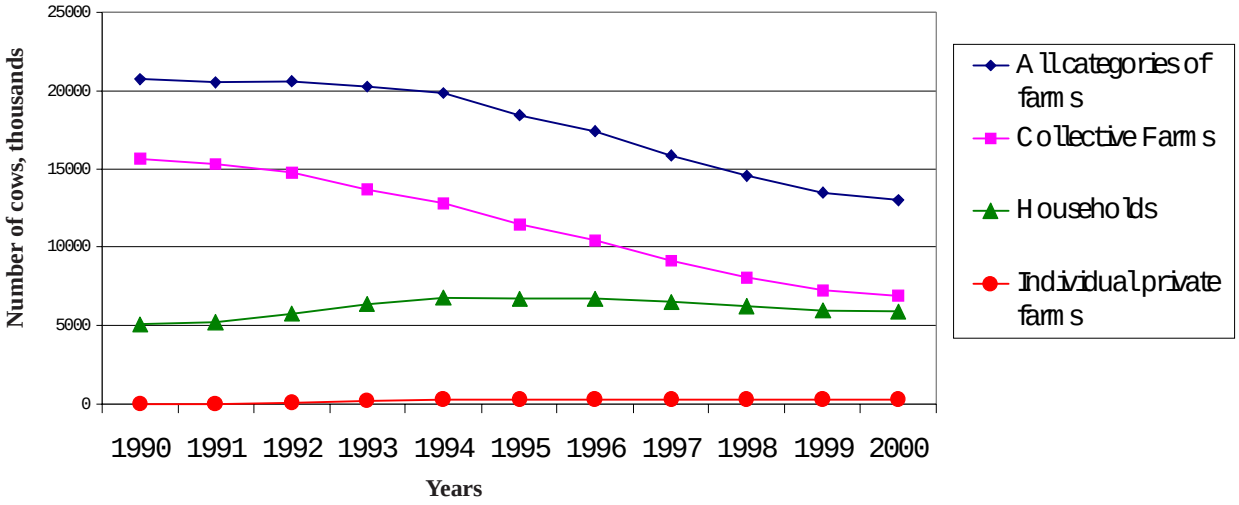


Figure 2. The tendencies of the cows number dinamics in the farms of different ownership categories during 1990-2000.

[1]Vassili V. Shapotchkin is actually the Head of Department.

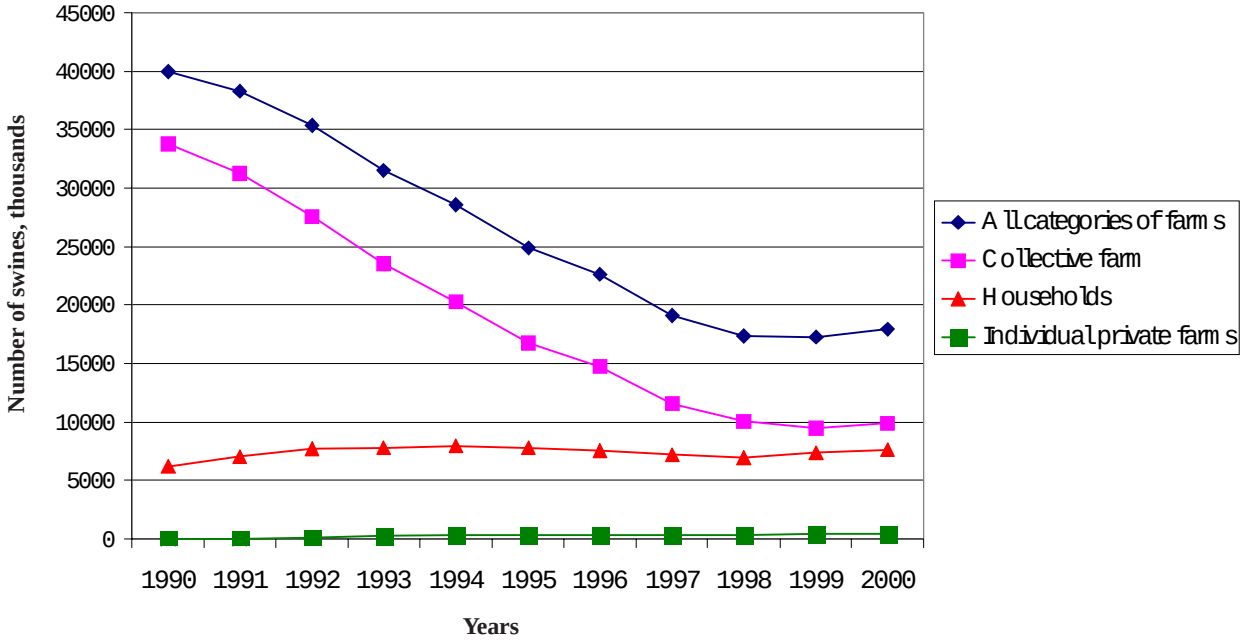


Figure 3. The tendencies of the swines number dinamics in the farms of different ownership categories during 1990-2000.

into Divisions of different livestock industries (cattle, swine, horse, poultry etc production). There is "ROSPLEM" Division with regional branches, responsible for organization of AI all over the country, realised through the registered AI stations.

The Animal Production Departments of the Regional Agricultural Ministries are responsible for the distribution of Governmental donations, breeding planning, inspection of the registered stock and reproductive farms, AI and embryos transfer stations, milk recording laboratories, breeding data collection, processing and statistic, grading up of the personal qualification and professional study. All information about animal breeding is collected in the Principal Information / Selection Center of the Russian Institute of Animal Breeding Practice (VNIIPLEM), which is directly subordinated to the Department of Animal Production and Breeding Practice of the Russian Ministry of Agriculture and Food. The 24 Research Institutes of Russian Academy of Agricultural Sciences, Animal science faculties and Departments of the 65 Agricultural Universities all over the country create "extension" net for Russian animal production.

Although 50 percent of the livestock is concentrated in households and individual private farms, the Russian breeding organizations concentrate their efforts and attention on the animal herds of large-scale collective farms. There are no animal marking and identification, no milk recording

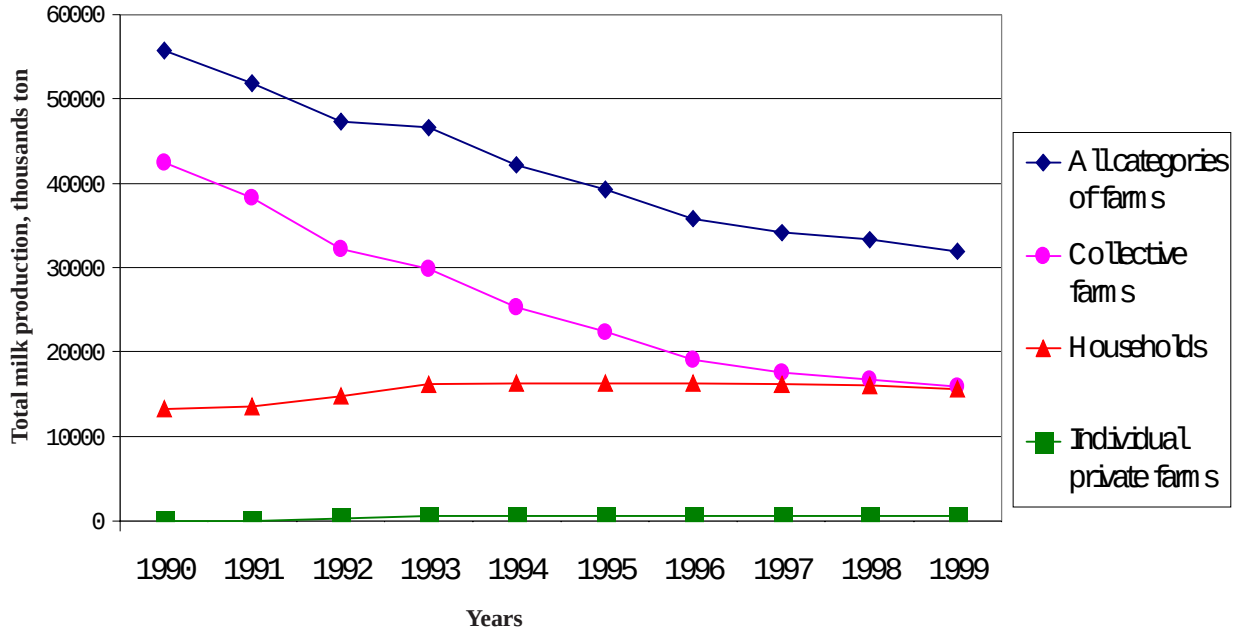


Figure 4. The tendencies in milk production during 1990-2000.

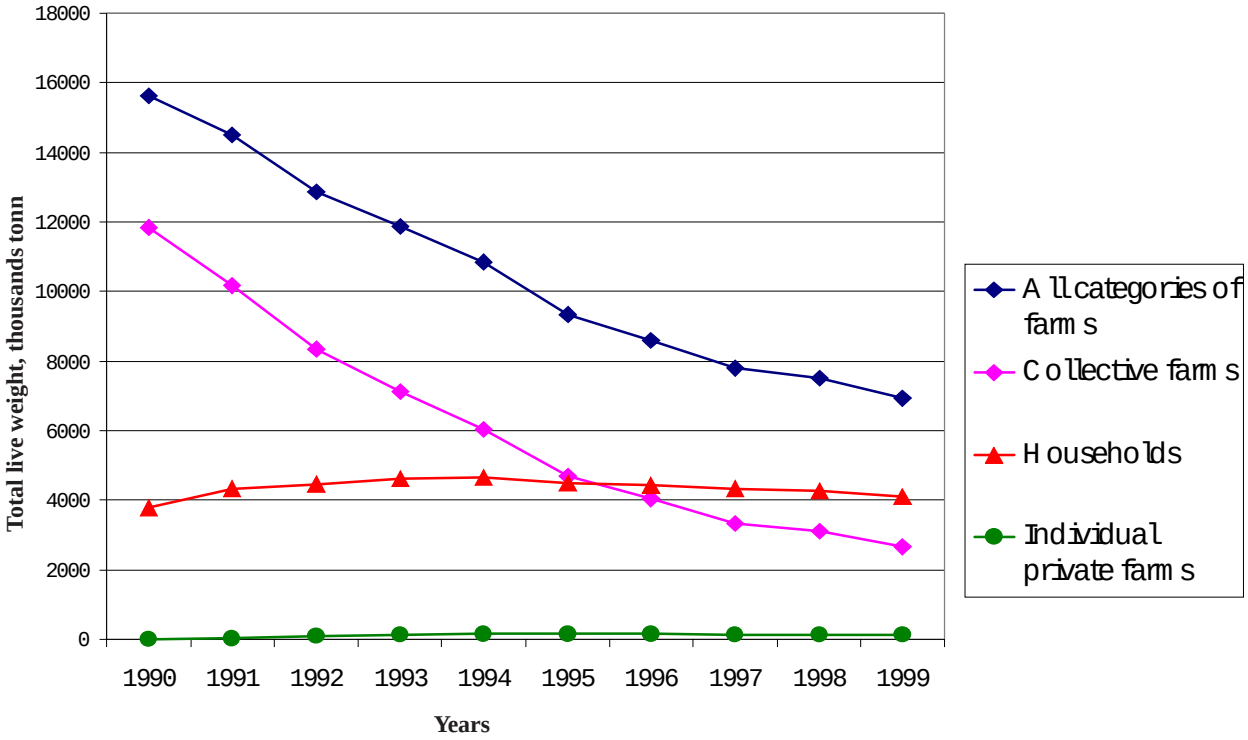


Figure 5. The tendencies in meat (including poulrty) production (sold for slaughter in live weight) during 1990-2000.

in the households and individual private farms (excluding rear examples in horse breeding), therefore, all statistics and valuations in these categories of farms are very approximate. The only service available to the private farmers is state veterinary control and animal health protection, which is really severe because of well developed State Veterinary Laws. The other service which becomes popular among the private farmers is artificial insemination of the cows by the semen of high quality purebred sires. The "ROSPLEM" organization through the system of the regional AI stations is proposing the quality semen and insemination service for individual farmers and householders, together with the large-scale collective farms.

In accordance with the State Breeding Low ("On Animal Breeding") the breeding stocks (herds) of agricultural animals might be registered in the State Breeding Register for:

- inventory of the breeding herds in Breeding Organizations;
- determination of the State donation for Breeding Organizations;
- data-base producing for breeding actions planning;
  inspection of the Breeding Organization and control of its licensed activities;
- marketing and certification of breeding products (animals, semen, embryos);
- breeding products evaluation for insurance, trade etc.

Both private and state herds are the subject of state registration by Breeding Low in case of their legal (by license) activity in the field of animal breeding and / or reproduction. There are four main grade for such activities:

- stock breeding farms (improvement of animal's productive qualities through the intensive selection and purebred mating and producing both animal products and the breeding animals - males and females - for sale);
- reproductive farms (producing the animal products and breeding animals for sale);
- AI stations or organizations (collection and distribution (sale) for AI the semen of the testing and tested sires;
- embryos transferring organization.

On the basis of special questionnaires (Figure 6) the Principal Information / Selection Center in Russian Institute for Animal breeding practice (VNIIPLEM) is preparing documents (register forms) for approval by Department of Animal production and breeding practice in the Russian Ministry of Agriculture and Food .

The farms and organizations which got the license and passed the registration procedure may get unique registration code in the State information system. Every year before February 1 they are obligated to send breeding report on floppy disk including all information about changes in their herds during the year (number of animals, productivity,

breeding value, reproductive abilities, information about approving sires etc.) The control of the dates significance lays on the herd owners or collective farms managers and regional breeding departments of the local agricultural administration. Both private individual or collective farms might be registered and licensed by law, but there are only example private farms owners (horse breeders as a rule) trying to follow state register.

Before obtaining license and registration ,the herd owner or herd manager (those who intend to do their business with breeding products : animals, semen, embryos) have to implement and follow state regulations in the fields of:

- animal marking and identification;
- productivity traits evaluation, control and recording.

State system for cattle marking and identification

In accordance with the Article 22 of the State Low "On Animal Breeding" the State Marking and Identification System is destined for:

- accurate animals identification on the basis of unique coding and marking numbers;
- visual identification of the every animal both in the frame of separate herd and all breeding population of the country;
- normal functioning of the information system for diary cattle stocks;
- implementation of the technological system for diary cattle stocks;
- support and promotion of the technological system for significant productivity registration;
- improvement of the dates control for breeding products certification

The identification number of the breeding animal consist of the ten figures, where two first present the code of the Region (for example "50" is the code for Moscow region, "64" – Saratov region etc.) and the other eight (from 00000001 to 99999999) destined for animal numeration inside the region.

The standard brass or aluminum rectangular ears tags (80 mm x 13 mm) should be used as bearer of identification number.

The tag should be fastened on the right ear of the calf not later then three weeks after birthday by certified specialists of the breeding organization.

The individual technological four-meaning numbers on plastic bearers might be used for better animals recognizing during milking, weighting, artificial insemination etc. The plastic left ear tags, bracelets or collars might be used for these purposes.

There are regional factories producing special equipment for ear tagging themselves or in cooperation with foreign companies and associations (Germany, New Zealand, USA etc.).

The State Breeding Register | | | | | | | | | |

QUESTIONNAIRY FOR BREEDING STOCK

Information about herd owner

Name of Organization_____

Legal address_____
(Postal Code and Address)

_____

Telephone # (_____) _____ **Fax #** (_____) _____

Identification Code of Organization

Railroad Code

Taxpayer's Code

Bank account # _____

License issued _____ **2000 , valid to** _____

The Name of License issuing Organization _____

The sort of Activity by License _____

The Animal Species _____

Participation in Animal Breeding Associations, Unions, Societies

_____
(Name, Founder, Participants)

The sort of Property _____**; the percentage of Federal State Property**
(State, Regional)

_____ **(%) ; the percentage of Regional Subject of RF**_____**(%)**

The Head of Organization _____
(Position, Name, Second name, Family name)

The Breeder_____
(Position, Name, Second name, Family name)

Telephone (____)_____

Figure 6. Questionnaires for the State Breeding Register.

All breeding animals in 1999 from registered herds have at least technological plastic ear tag and the same tattoo number. The identification number tagging is only under developing, therefore breeding animals from registered herds have their "virtual" identification numbers in computers only.

State system of productivity traits and genotype evaluation, control and recording.

In accordance with the State Instruction about licensing of different activities in the field of animal breeding along with the stock farms, reproduction farms, AI stations and embryo transferring organisation the controlling organisations for productivity traits and genotypes evaluation and recording have to obtain state license.

Such organisations may propose the service for the stock or reproduction farms in the following fields:

- control-testing stations for comparison and evaluation of the new selection achievements in standard technological conditions;
- laboratories for milk, meat, wool etc. quality control and recording;
- immuno-genetic laboratories for pedigrees control and genetic anomalies reveal;
- computer information centres for data collecting, processing, evaluation and distribution.

There is no special recording organisation for whole Russian Federation. The Department of Animal Production and Breeding Practice in the Russian Ministry of Agriculture and Food carry out the general control over milk recording laboratories by the licensing and registration system.

In 1999 only 22 Russian regions out of 74 had 35 milk recording laboratories which covered the total population of 33 7000 cows. This is only 18 percent of breeding population which use the service of certified milk recording laboratories, the other 82 percent of farms check the quality of their milk in their own farm laboratories using old methods for milk fat determination (sulphuric acid- isoamil spirit technique). There is no control on milk protein, lactose, somatic or bacterial cells content in farm laboratories. The main problem for existing milk recording laboratories is insufficient old fashion equipment. For example only 4 milk recording laboratories out of 35 are equipped by "Combifoss" instruments.

Actually, the most severe milk quality control takes place on the dairy and milk processing plants. The laboratories of this plants take care of the milk protein and fat content, lactose, somatic and bacterial cell count, alcohol test and milk temperature and density. For example, Moscow and Moscow regional milk processing plants (including joint-venture companies "Compina", "Ermann" and "Wim-Bill-Dann") have well equipped milk laboratories and they are ready to propose the better prices (to 8 Rbl instead

3 Rbl/kg) for high quality milk. These severe requirements of the processing industry together with necessity of State registration for breeding stock and reproductive farms is the serious stimuli for large scale milk producers.

As reported in table 1, 49.2 percent of total milk production is concentrated in households (1-3 cows per family). There is almost no control of the breeding organisations over this category of farms in the frame of milk recording. There is only veterinary control at the level of local municipal administration and local markets. The only example householders are keeping home records of animals productivity.

The milk recording laboratories are implementing its business on commercial base, so milk producers are obligated to pay for laboratory analyses. The equipment in such laboratories consists, as a rule, of a mixture of machinery, both imported (in former Soviet period, in the frame of international projects, for example "The Improvement of the Diary Cattle Breeding in Moscow region" together with ADT, Germany) or home produced in former Soviet Union. The imported equipment, as a matter of fact, is old, second hand and Russian one is unreliable and old fashion (unable to count somatic or bacterial cells number, to measure lactose and the protein content). But because of economical situation in agriculture there are no enough investments into agricultural service.

The example of Moscow Timiriazev Agricultural Academy shows clearly the economic effectiveness of the milk recording service when and if it is only possible to obtain the necessary equipment. In 1998 on the basis of MTAA Department of Beef and Diary Cattle Breeding and former Agricultural Ministry laboratory for testing analytical automatic machinery and equipment "AgroPribor" the Milk testing laboratory was established to propose services for diary farms in Kaluga, Moscow and the Ryazan regions. Now it covers about 24 registered breeding farms with the total population of 15 000 diary cows.

In 1999, the Laboratory following to sophisticated procedure got the State License. At first step the below mentioned documents were produced.

- application for License;
- the copy of MTAA Status, notary approved;
- the copy of MTAA State Register;
- the copy of taxpayer (MTAA) register formulary;
- the copy of Tax Inspection Register inquiry;
- the permission of Municipal Anti-conflagration Office
- the copy of bill about payment to Federal budget for Application examination and conclusion.

At the second step the Commission of the Moscow Regional Ministry of Agriculture examined *in situ* the equipment of the laboratory, methodology and personal qualification. At the third step the Moscow Regional Ministry

of Agriculture produced the official conclusion and took necessary decision. At last (fourth step) on the basis of above mentioned conclusion the Department of Animal Production and Breeding practice of Russian Ministry of Agriculture and Food has issued the necessary License for three years. In accordance with the License the laboratory of MTAA is permitted:

- to test and record milk quality;
- to test pedigrees and confirm breeding value of the animals (dams);
- to propose educational programs for animal breeders and milk testing laboratory experts.

Now the laboratory is relatively well equipped with "Milkoscan", "Fossomatic", necessary reactive , the working personal posses many years experience. Thanks to financial support of the World Bank Project ARIS the Ministry of Agriculture decided to buy new highly productive equipment for milk testing.

Conclusion

Since 1990 to 1999 the decreasing of the total number of cattle, swine, sheep and goats, meat and milk production may be observed in Russia (per capita meat consumption decreased to about 37 kg). This downfall is in the strong relation with the decrease in production in large scale collective farms, which still may not be compensated by production of households and individual private farms. During the last two years the situation in livestock and poultry production was deteriorated because of extreme drought and low yield of grain and fodder crops.

The growth of the gross agricultural product (in Roubles) was achieved because of inner prices increase.

Instead of capitalisation (concentration and specialisation of animal production farms) the old, low-productive, unprofitable household production takes remarkable place.

In this condition the breeding organisations are concentrating their efforts and attention on large scale producers, but, because of:

- uncertainty with Land Possessing reform;
- absence of investments in agricultural production;
- low productivity in breeding population;

the effectiveness of selection actions is insufficient and there are no real call for breeding service (animal marking, milk recording, sire testing etc.).

The limited State resources are sufficient to support only example stock farms in different regions (through the system of "per dam" donation). In surrounding of the great industrial cities prosperous food trade companies and big processing plants may redistribute (and they really do it!) their profit to reconstruct large scale farms as row material supplement basis for itself.

The international breeding projects and organisations (ICAR as matter of fact!) may play their remarkable role through the organisation of the example milk recording laboratories on the basis of Research institutes and Universities with the main idea to educate the future animal producer and create future consumer of high productive technologies and modern equipment.

The local low scale milk / meat production and market may be transformed and developed thanks to the self-organisation of hole-sale trading and relapsing food, instruments, services, knowledge supply.

References

The main characteristics of the Agri-Industrial Complex of the Russian Federation in 1999. 2000, GOSCOMSTAT, Moscow, pp. 111.

Regulation about State Breeding Register, Collection of the Acts and Regulations of the Department of Animal Production and Breeding practice of the Russian Ministry of Agriculture and Food, Moscow. 1998, pp. 75-79

Regulation about the State system for animal marking and Identification (The Cattle. Diary-Beaf Breeds.). 1998. Collection of the Acts and Regulations of the Department of Animal Production and Breeding practice of the Russian Ministry of Agriculture and Food, Moscow, pp. 96-105.

Krasheninnikova, L. 2000. Meat Market in the Russian Federation in 1999. Office of the Agricultural Councilor Royal Netherlands Embassy, Moscow, pp. 40.

Zyat'kov, J., Kurmysheva, N. & Nakonetchny, V. 1999. Production and Meat Market in Russia, Central Computer Center of the Russian Ministry of Agriculture and Food, Moscow, pp. 25.

Smith, M. A. & Maximenko, M. 2000. Russia. Livestock and Products. Semi-Annual 2000. USDA Foreign Agricultural Service, GAIN Report # RS0005, pp. 10.

Smith, M. A. & Maximenko, M. 2000. Russia. Poultry and Products. Semi-Annual 2000. USDA Foreign Agricultural Service, GAIN Report # RS0002, pp. 10.

Status of livestock production in Bosnia and Herzegovina

S. Muratovic & F. Dizdarevic

Faculty of Agriculture Sarajevo, Zmaja od Bosne 8, 71000 Sarajevo, Bosnia-Herzegovina

Bosnia and Herzegovina general information

Total area		51 197 km²
Inhabitants	1991	4 380 000
No. of farms	1991	569 581
Arable land per capita (ha)	1991	1.18
Agricultural land per inhabitant (ha)	1991	0.51

Agricultural land includes 1 million ha of arable land, 460 000 ha of meadows and improved pastures and 930 000 of mountain pastures.

Animal production

General background of the livestock sector (number of animals and milk production).

Table 1. Number of animals.

	1991	1999	
	BiH	FBiH	RS
Cattle	873 605	231 492	-
Cows and heifers	622 919	176 408	147 326
Bull for breeding	-	2 341	-
Sheep	1 301 340	299 069	-
Pigs	613 556	68 114	
Goat	-	3 2794	-
Horses	99 863	32 794	-
Rabbit	-	1 7563	

Table 2. Milk production (000 litres).

	1991	1999	
	BiH	FBiH	RS
Milk cows	880 118	286 522	-
Milk ewe	12 940	7 378	-
Milk goat	-	3 928	-

Table 3. Milk production per lactation (litres).

	1991	1999	
	BiH	FBiH	RS
Milk cows	1 540	1 901	-
Milk ewe	-	50	-
Milk goat	-	185	-

The pre-war small farmers kept the major part of animals mainly in extensive production systems with an average of 2.28 cattle or 13 sheep per farm. An average farm had between 1 and 3 ha of land.

Four percent of animals were kept on large production units. The State sector (ex-social sector) owned 29 800 cattle of which 12 000 were dairy cows (several farms with 500 to l 500 cows) 110 200 pigs, 13 000 sheep and 2.5 million poultry. Productivity was at a level attained in intensive production units in Western Europe.

Livestock reconstruction project in Bosnia and Herzegovina

Conditions for the economic reconstruction of Bosnia and Herzegovina and thus, for livestock reconstruction are also created through gradual implementation and establishment of the Dayton Peace Agreement.

Cattle import took place during the last four years (1996-1999) of the "Livestock Reconstruction Support in Bosnia and Herzegovina" project.

Table 4. Import of pregnant heifers in the Bosnia and Herzegovina (between 1996-1900).

Breeds	Heifers	%
Simmental	22 544	82.25
Brown Swiss	1 159	4.23
Grauvich	1 336	4.87
Holstein Friesian	2 312	8.65
Total	27 411	100.00

Source: PIU Housing (2000).

Animal breeding

Although a central breeding service did not exit throughout the entire period between 1945 to 1992, institutions in charge of breeding programmes have functioned at the level of agro-industrial combines and complexes. Some research and development institutes of these combines have carried out projects related to the evaluation of production potential of endangered local breads (e.g. Programme for *Busa* carried out by the UPI) or breeding programmes for the improvement of specific traits of local breeds (Bosnian Mountain Horse, milk production of the *Vlasicka* straps of *Pramenka* sheep). A programme of crossing domestic *Pramenka* with imported Merino types aimed at ensuring self-sufficiency in wool production was soon abandoned because of poor results and resistance from farmers.

Animal recording

In 1995 animal recording had not yet been established. Further implementation of the livestock reconstruction programme should include animal recording.

Conclusion

Bosnia and Herzegovina trade with the international community to prepare and realise the programme “Sustainable Development of the Livestock Production Sector in Bosnia and. Herzegovina”.

References

Annual Statistic Report of Bosnia and Herzegovina. Sarajevo, 1991.

Bajramovic, S. 2000. Alpski model organizacije seljackih gazdinstava i mogucnosti njegove primjene u planinskom rejonu Bosne i Hercegovine. Doktorska disertacija. Sarajevo.

Dizdarevic, F., Causevic, Z., Handic, R., Muratovic, S., Selak, V., Bogucanin, H. & Domba, E. 1998. Pasminska rejonizacija prezivara a Feder aciji Bosne i Hercegovine. Sarajevo.

Muratovic, S., Bogucanin, H. & Selak, V. 1999. Establishment of extension services for Livestock production in Bosnia and Herzegovina. Extension services for quality milk production. International Green Week, Berlin.

Situation in agriculture and animal breeding in Estonia

K. Reili

Agricultural Registers and Information Centre,
Kreutzwaldi 1, 50094 Tartu, Estonia

The year 1999 was quite difficult for Estonian farmers. The Data Statistical Office of Estonia shows that the production of meat, milk and eggs was lower than in 1998. Accordingly decrease of milk production was 12 percent, meat production 3 percent and egg production 11 percent.

The number of animals and poultry in agriculture is continuously decreasing. In 1999 the number of cattle decreased by 21 900, among them cows decreased by 14 200 (Table 1).

Since 1995 the number of cattle has continued to decrease by 6 percent per year and compared to 1995 the number of cattle has decreased by 22.9 percent.

Liquidation of cattle and cows are caused by bankruptcy or large numbers of producers.

The decrease in cows causes a decrease of milk production. According to milk recording data from 1998 the milk production was 4 766 kg milk per cow. In 1999 it was 4 530 kg milk per cow, this is 236 kg less. Lower production was caused by several circumstances.

Firstly, climatic conditions: a very long and cold spring and a very dry summer. Pastures were damaged by the drought and farmers had to start to feed winter feed from as early as August.

Secondly, the low milk price: compared to 1998 in 1999 the price was 22 percent lower.

Animal breeding in Estonia is regulated by the Farm Animal Breeding Act and ensuing animal breeding rules, approved by the Regulations of the Ministry of Agriculture.

The Farm Animal Breeding Act was passed on 24 May 1995. In connection with the harmonisation of legislation concerning animal breeding with the corresponding EU Directives, amendments were made to the Act on

9 December 1997, which entered into force on 3 January 1998. The Farm Animal Breeding Act regulates the breeding of bovines, pigs, sheep, goats, horses, fur animals and poultry. The Farm Animal Breeding Act provides for all general legal standards and is the basis for the State regulation of animal breeding. The Farm Animal Breeding Act specifies the tasks of private animal breeding associations and organizations providing animal breeding services, the rights and responsibilities of breeders, the procedure for issue and annulment of activity licences to animal breeding organizations, the procedure for keeping breeding records and registers, the assortment of animals used for breeding, the grounds for collecting performance data and assessing breeding value, the procedure for marketing, import and export of breeding material, the role of the State in animal breeding, the organization of State supervision and the responsibility of the breeder if he is found guilty of violation of legislation concerning animal breeding.

Pursuant to the Farm Animal Breeding Act, animal breeding rules were prepared and approved on 15 February 1996 following the Regulations of the Ministry of Agriculture.

Table 1. The number of animals and poultry in agriculture (thousands) at 31 December 1999.

			1999 / 1998	
	1998	1999	+/-	%
Cattle	307.5	285.6	-21.9	92.9
Enterprises	199.3	159.6	-39.7	80.1
Family farms	108.2	126.0	+17.8	116.5
%	35.2	44.1		
Cows	158.6	144.4	-14.2	91.0
Enterprises	95.5	78.6	-16.9	82.3
Family farms	63.1	65.8	+2.7	104.3
%	39.7	45.6		
Pigs	326.4	281.2	-45.2	86.2
Enterprises	278.4	228.2	-50.2	82.0
Family farms	48.0	53.0	+5.0	110.4
%	14.7	18.8		
Sheep	30.8	29.4	-1.4	95.5
Enterprises	-	-	-	-
Family farms	30.8	29.4	1.4	95.5
%	100.0	100.0		
Poultry	2 635.7	2 433.1	-202.6	92.3
Enterprises	1 632.2	1 451.3	-180.9	88.9
Family farms	1 003.5	981.8	-21.7	97.8
%	38.0	40.4		

State animal breeding inspection

State Animal Breeding Inspection is a State authority of the Ministry of Agriculture, responsible for the regulation and supervision of animal breeding in Estonia. There are three regional animal breeding inspectors for cattle. They take care of the execution of the Animal Breeding Law. The first Animal Breeding Law since liberation has been categorical since May 1995. Since then the regulations for animal breeding as well as the law itself have been constantly upgraded according to the new requirements (EU, ICAR). The Government of Estonia supports animal breeding, especially milk recording and genetic improvement of breeding programmes.

Estonian animal breeding association

The private breeding organizations were recently recovered in Estonia, for 1992 the Estonian Black and White Cattle Breeding Association and Breeding Cooperative "Estonian Red Cattle" were formed. The Breed Society of Estonian Native Cattle has been working since 1989. All the organizations have democratically elected a board, which elects a managing director. The owners of breeding associations are farmers. The managing director is responsible for the functions of the organization, herd book registration, bull testing, marketing of semen and breeding stock, distribution of semen, insemination registration, advisory and extension. Together with the private breeding organization of other agricultural animals, they form the Estonian Animal Breeding Association.

Estonian native cattle

This breed has existed on Estonian territory from time immemorial and is the basis for other cattle breeds namely, the Estonian Black and White and Estonian Red Cattle. The Estonian native cattle have been crossed with other breeds, such as Jersey and West Finncattle. The future selection programme considers the use of Finncattle only. This breed is unique because there are only 500 cows left in Estonia.

The Estonian Red Cattle

The Estonian Red Cattle was developed as a breed in 1930-1950. The main immigrating breed was the Danish Red. During 1956-1965 about 60 bulls were imported from Denmark. The effect of Danish Red bulls to Estonian Red was extremely favourable. For two generations the milk yield and fat percentage increased and the exterior and udder conformation improved. In 1984 the import of bulls from Denmark was re-established. Mainly Danish Red bull improved with American Swiss but also Red Holstein bulls, were imported. These bulls stabilised the milk yield on a reasonable level. However, it became clear that high milk fat percentage and strong legs can be saved in Estonian red cattle only with limited use of Red Holsteins. The results were better with the use of Brown Swiss and especially Danish Red. Also, the semen of Swedish Red and Norwegian Red bulls has been used.

The Estonian Holstein (Estonian Black and White Cattle).

This breed was developed under the strong influence of the Holland Black and White cattle. The first Black and White bulls and cows were brought from Holland in 1838. The breed type was very close to the Dutch Friesian type, with good and bad characters. The first Holsteins from USA were imported in 1975. After that Holsteins were immigrated from Canada and then from Germany. Holstein bulls increased milk yield considerably and improved the udder shape and attachment, also the size of animals. The influence of US and Canadian bulls has been very effective. To increase milk protein and fat production the Dutch Holstein bulls have been used again.

Agricultural Registers and Information Centre (ARIC)

The Agricultural Registers and Information Centre is responsible for the organization and development of milk recording services, genetic evaluation of dairy cattle and data processing services for livestock farmers and breeding organizations in Estonia. ARIC occupies a central place in Estonian animal breeding providing services for dairy and pig farmers, breeding organizations as well as veterinary services, dairy processing

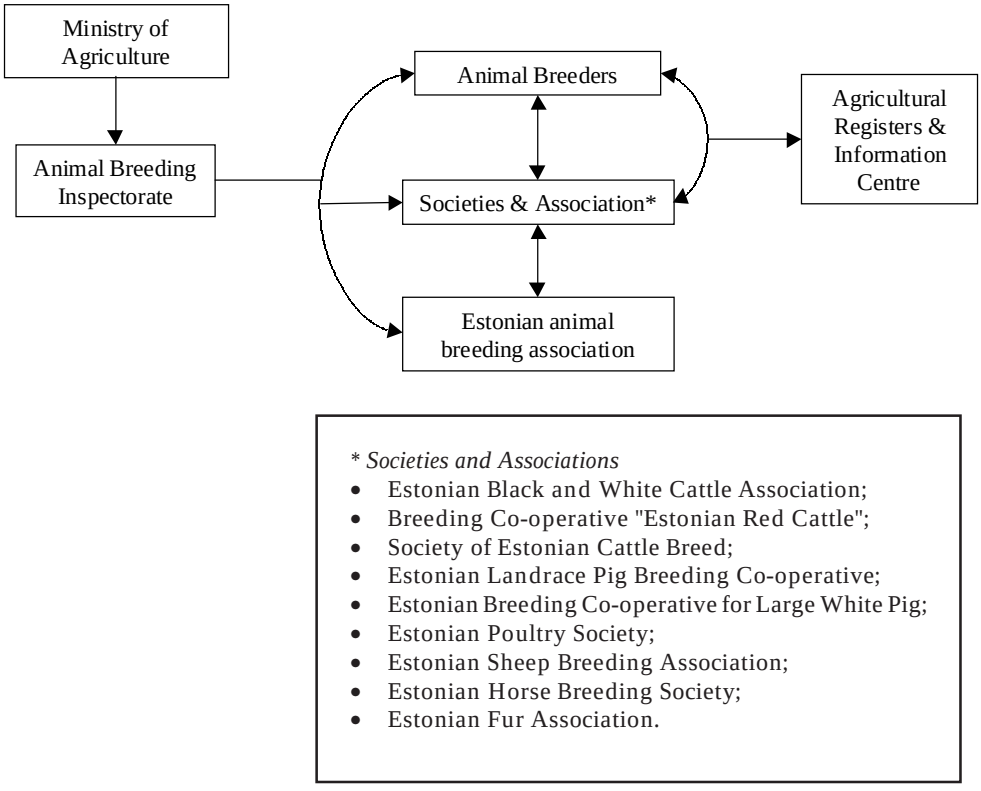


Figure 1. Structure of animal breeding in Estonia.

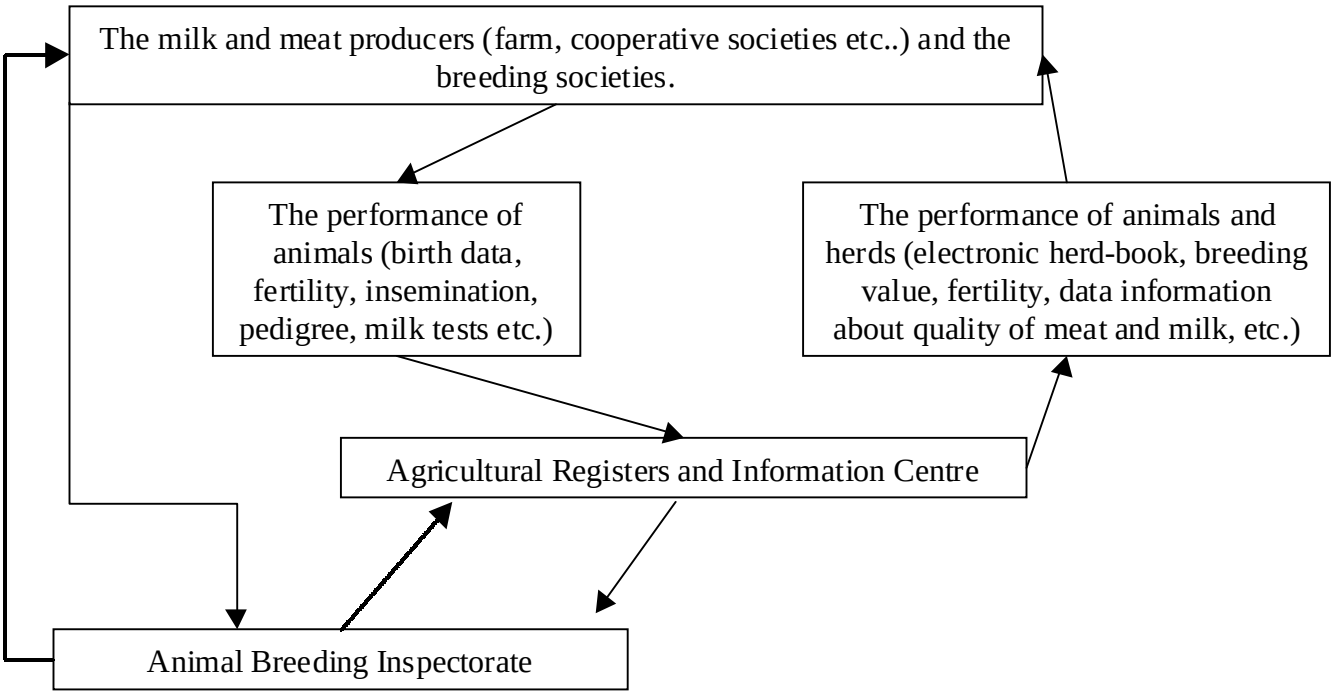


Figure 2. The movement of information.

industry, advisers and research institutions. From 2000 ARIC will be owned 100 percent by the State. Farmers pay all the operational costs of the used services from ARIC. ARIC has three departments:

- the field service is responsible for control and training of milk recording assistants and farmers, cattle identification, development of ARIC services and public relations. For fifteen counties we have eleven regional supervisors. They also operate as advisers for udder health, feeding and farm management;
- the Milk Analysing Laboratory is responsible for the milk analyses and the sample transportation. Last year 1.04 million samples were analysed for fat, protein, somatic cell count and urea. Since 1998 our laboratory has participated in ICAR inter-laboratory tests. The Ministry of Agriculture chose the ARIL milk laboratory to be a neutral laboratory for milk analyses for payment;
- the Data Processing Unit has two main tasks, the development of computer systems and services for agriculture and data processing for milk recording and animal breeding for Estonia. From 1998 all the data was processed in the ORACLE system. The main objective for the data processing services has changed, it is now the quick retrieval of information for the farmer, breeding organization or adviser. The duplicated data collection (AI, Central Cattle Register), is to be avoided and new technology makes it possible. The milk recording, herd book

and artificial insemination are fully integrated into the same database and the output is made available for all relevant parties. Since 1998 the Ministry of Agriculture, Animal Breeding Inspection, farmers and breeding organizations have had the possibility of ONLINE access to databases. From 1999 it has been possible to access the database via INTERNET (www.reg.agri.ee).

Table 2. Oracle main tables.

Table name	Content	Number of entries
Owner	Our clients	53 688
Animal	Animal pedigree	1.62 million
Owners animal	Location of animal	822 488
Milking	Milk recordings	5.2 million
Lact	Lactations	3.35 million
Insemination		1.1 million

Milk recording

The number of cows being milk recorded at 1 January 2000 was 106 616. About 73.8 percent of cows are being milk controlled in Estonia. The number of cows being milk recorded at 1 January 1999 was 117 120 (-10 502 cows left during one year). Problems occurred with the very low milk prices and bad weather conditions.

The method used for milk recording is B4 in Estonia. The farms use more and more milk meters approved by ICAR.

The number of herds being milk recorded as of 1 January 2000 was 2 921 (average herd-size 36.5). The number of herds being milk recorded as of 1 January 1999 was 2 732. (average herd-size 42.9)

System of funding

The Agricultural Registers and Information Centre is responsible for the distribution of direct governmental subsidies to farmers. Last year farmers received direct subsidies for milking cows, sows, ewes-goats, young stock and growing grain. These subsidies are paid in full by the State. In 2000 the SAPARD project for paying subsidies to farmers from the European Union will commence. The reorganization of the structure of the Agricultural Registers and Information Centre is now taking place. The structure will consist of:

- State Registers
  - Field register division
  - Animal register division
  - Grant register division, etc.
- Paying Agency will manage with support.
  - 1. Direct support (totally paid by Estonian State)
  - 2. SAPARD support.

Figure 3. Development of milk recording in Estonia.

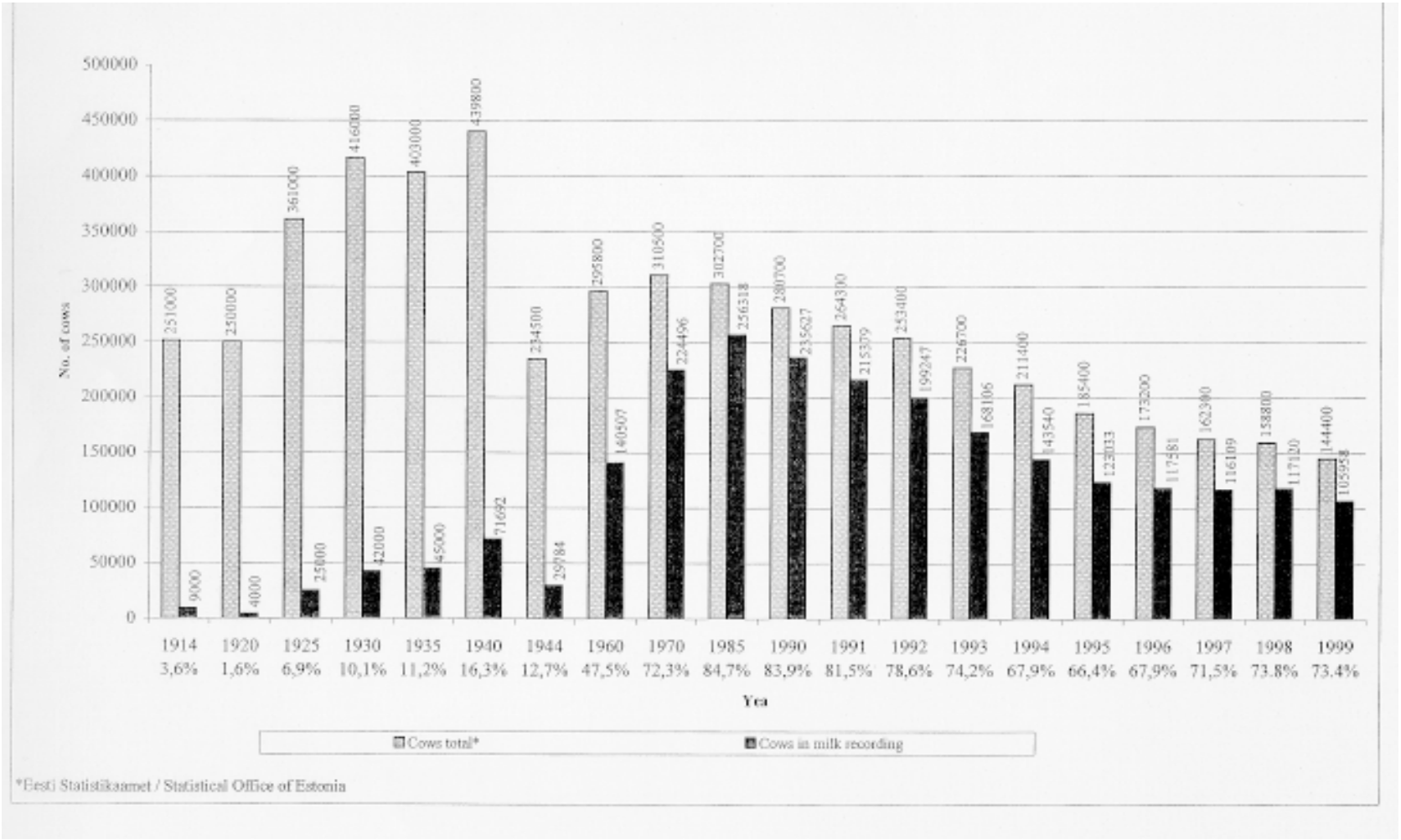


Table 3. Size and number of herds in milk recording 1990-1999.

	1999		1998		1997		1996		1995		1994		1993		1992		1990	
Herd size	No. of herds	%	No. of herds	%	No. of herds	%	No. of herds	%	No. of herds	%	No. of herds	%	No. of herds	%	No. of herds	%	No. of herds	%
1 2	425	14.7	310	11.3	447	17.1	639	24.4	871	29.8	1230	35.5	1248	33.1				
3 4	469	16.2	322	11.8	397	15.2	498	19.0	615	21.1	735	21.2	803	21.2				
5 6	411	14.2	452	16.5	390	14.9	303	11.5	301	10.3	326	9.4	398	10.6				
7 8	315	10.9	312	11.4	251	9.6	193	7.4	205	7.0	219	6.3	222	5.9				
9 10	212	7.3	223	8.2	200	7.7	158	6.0	136	4.7	126	3.6	144	3.8				
11 50	682	23.5	684	25.0	484	18.5	366	13.9	291	10.0	261	7.5	291	7.7				
51 100	116	4.0	124	4.5	116	4.4	119	4.5	127	4.3	151	4.4	161	4.3				
<=100	2 630	90.8	2 427	88.8	2 285	87.5	2 276	86.7	2 546	87.2	3 048	87.9	3 267	86.6	46	10.7	7	2.1
101 300	188	6.5	217	7.9	240	9.2	263	10.1	278	9.5	294	8.5	342	9.1	99	23.1	24	7.1
301 600	60	2.1	66	2.4	67	2.6	64	2.4	74	2.5	102	2.9	120	3.2	158	36.9	107	31.5
601 900	12	0.4	15	0.5	13	0.5	13	0.5	14	0.5	16	0.5	27	0.7	83	19.3	114	33.4
901 1200	4	0.1	4	0.1	4	0.2	5	0.2	5	0.2	5	0.1	6	0.2	27	6.3	54	15.9
1201 1500	0	0	0	0	0	0	0	0	0	0	1	0.0	2	0.1	10	2.3	23	6.8
>1500	3	0.1	3	0.1	3	0.1	3	0.1	3	0.1	3	0.1	3	0.1	6	1.4	11	3.2
Total	2 897	100	2 732	100	2 612	100	2 624	100	2 920	100	3 469	100	3 767	100	429	100	340	100

Animal identification and registration

The Agricultural Registers and Information Centre is creating new registers (fields, producers, pigs, goats, sheep, etc.) Beginning this year, the Register Department will be restructured.

Cattle identification

In 1994 it was decided to adopt the system of a lifetime number in the scope of the EU Regulations. According to the Regulation, all calves are to be identified with a unique eartag (with a ten-figure lifetime register number) within six weeks after birth. The yellow plastic eartag was put onto the calves' right ear. From January 2000 we began to use, according to EU Regulations, yellow plastic eartags on both ears. The eartag consists of Estonian ISO-code "EE", a ten-figured register number, barcode and ARIL logo. After birth, calves have to be identified with eartags within 20 days and registered in the animal register within seven days.

Since 1999 in Estonia, ten-figured lifetime register numbers for goats and sheep have been used.

Genetic evaluation

Estonia has been a member of INTERBULL since 1995. From May 1996 the Multiple-trait Blup Animal Model has been used for genetic evaluation of milk production traits and Estimated Breeding Values (EBV) for dairy type. EBVs for milk production traits are estimated for 100 days and 101-305 of first lactation, second and third lactation. Estonian cattle breeders are effectively using the EBVs for cows for breeding for higher quality breeding replacement. In 1998 the first official INTERBULL proofs for Estonian Holstein bulls were obtained, which gave fair ground for the decision made for import and also for the national breeding programmes. From 1999 we began to use Test Day Model for genetic evaluation.

Restructuring of milk quality, production and milk recording in Lithuania

A. Svitojus

Rural Business Development and Information Centre,
Tuzenhauzu 39A, 2600 Vilnius, Lithuania

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

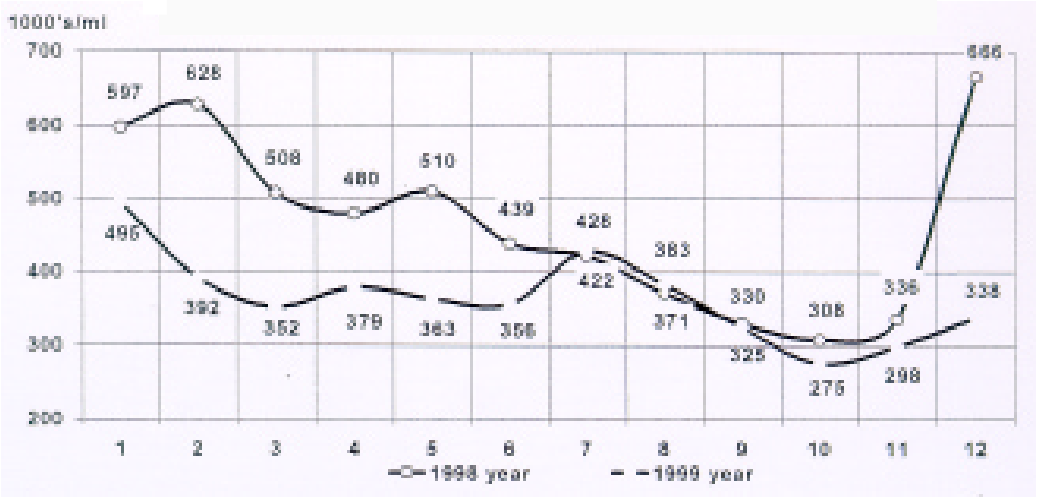


Figure 1. Change the average numbers of somatic cell per 1998-1999.

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.

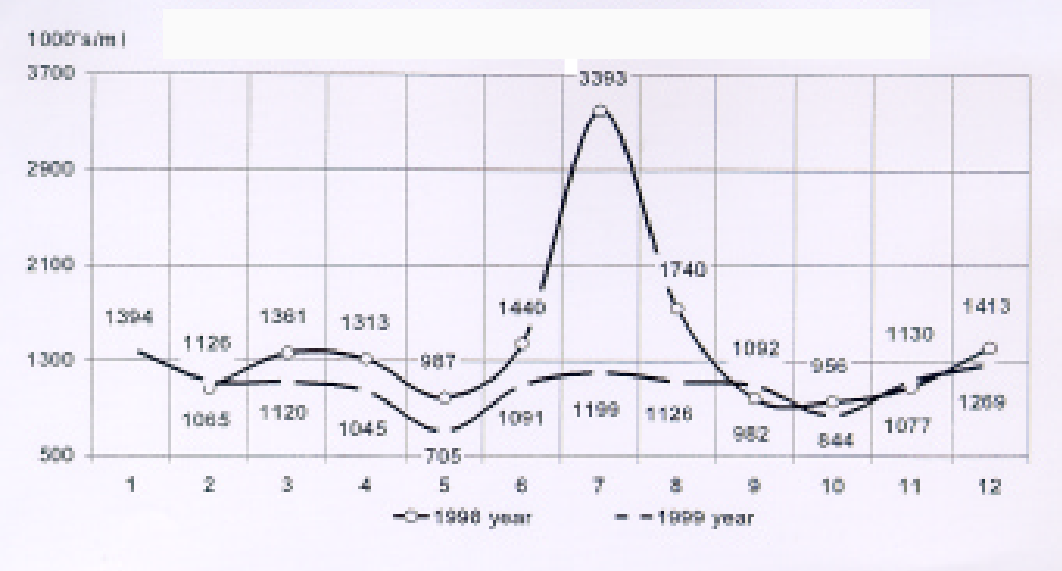


Figure 2. Change the average number of bacteria pollution per year during 1998-1999.

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.

The role of breeder organizations and the state in animal identification and registration in Albania

N. Tahiraj & A. Mehmetaj

Ministry of Agriculture and Food, Animal Production Service, Tirana, Albania

Introduction

Livestock in Albania has an important place in the overall agriculture output. During 1999 animal production realised 49 percent of the agricultural output.

The fact that animal production has an important place in gross agricultural output is related not only to the appropriate conditions or the inherit traditions but also to the increased needs and requests for more animal production especially the typical Albanian ones. During the privatisation of the agricultural system 490 000 small family farms were created of which 320 000 (or 82 percent) of them are breeding livestock animals.

The average size of the land is 1.4 ha / farm. It varies from 3-4 ha / farm in low areas to 0.5 ha / farm in mountain areas.

Table 1. Number of animals (in '000 heads).

	Years			
Description	1996	1997	1998	1999
Cattle	806	771	705	720
Cows	483	432	423	432
Sheep / goats	3 232	3 006	2 923	3 061
Sheep	1 982	1 858	1 872	1 941
Milk sheep	1 453	1 372	1 395	1 435
Goat	1 250	1 148	1 051	1 120
Milk goats	895	840	764	796
Pigs	98	79	83	81
Sow	12	10	9	9
Equidae	226	226	221	215
Poultry	4 108	4 566	4 862	5 023
Beehives	54	57	57	67

Statistic Department of the Ministry of Agriculture and Food

Recent years have been characterised by the number of animals stabilised and the inclination to the increasing of the yield through the high potential animal breeding in some species.

It is necessary to say that the lack of infrastructure of the collection and production processing systems, the lack of information related to markets and prices and the lack of the agricultural credit bank, etc., are some of the factors that obstruct animal production progress.

The private family farms have a limited number of animals and they mainly produce to fulfil their family needs. Independently of the limited number of animals, the extension of the production for markets is observed. The favourable situation is influenced by a number of factors, namely:

- the need for milk and its by-products supply to families;
- the low cost of fodder production especially in extensive conditions;
- the particular characteristics of milk production as a continuous source of income.

The extension of animal production is realised by the increase in the number of specialised farms. There are about 705 farms breeding five to ten cows and about 578 farms breeding over 100 sheep and goats.

Table 2. Differentiation and development of the production of farms.

	Cows for milk			Cattle for meat		Sheep and goats	
	< 5	6-10	11-50	>50	11-50	100-200	>200
Year 1998	340 230	381	39	87	1	1 099	152
Year 1999	383 711	640	65	165	1	1 482	347
Difference	43 481	259	29	78		383	195

As we can see, milk production is at a high level. It fulfils the requests of the market while egg and meat production is still at low levels.

Milk per capita is 196 kg, 21 kg meat (slaughter weight) and 121 eggs per capita from local production.

The animal production development rhythm is reported in table 3.

Cows produce 84 percent of the total milk production, sheep and goats produce 16 percent. Milk consumption is 250 kg per capita of the population (FAO, 1998).

Cattle produce 55 percent of total meat production, sheep and goats produce 31 percent and pig and poultry produce 14 percent. Meat consumption is 30 kg per capita of the population.

Table 3. Livestock production (in '000 tons).

Description	Years 1996	1997	1998	1999
Milk	1 043.7	849.6	861	907
Eggs (in mill)	314.0	337.0	397	414
Sheep wool	3.2	2.9	3	3
Meat (live weight)	105.4	104.3	106	111

Livestock breeder associations

There are many associations carrying out tasks and coordinating activities in the livestock sector. They are: the Association of Cattle Breeding, Association of the Inseminators of Albania, Dairy Businessmen Association, "*Begatia*" DDP-FARM-CO Association, ELBA-NOR working in the Elbasani district, Farmers' Association of Jersey Cattle Breed in the Shkodra District, Farmers' Association of the Taranteze Cattle Breed in the Korea districts, etc.

Associations were created as a new need. They provide specialised advice, information and services, coordinate activities in relation to: the other associations, research and experimentation institutes, public authorities and the meat and dairy industry. They solve problems related to livestock producers, trade tasks, etc.

For example, the Association of Farmers of the Taranteze Cattle Breed in the Korea District is active and well-organized.

- It has a General Assembly of farmers breeding Taranteze pure breed and its crossing.
- The Association Steering Committee is composed of five farmers (the President of the Association, Vice-President, the Secretary, an accountant and another member with no specific function).
- The Association operates based on its statute and internal regulations.

Association tasks

- The preservation of the breeding and productive indexes and the increase in the number of pure-bred animals and their crosses.
- The organization of milk control, artificial insemination and the structures of the herd book and its own herd book. The Association of the Farmers of the Taranteze Cattle Breed created the first herd book in Lithuania.

The reproductive animals with their own individual data, offspring testing and production data, etc. are registered in the herd book. Based on these data, breeding values are estimated and consist of:

- the testing of their offspring for the traits related to: yield, reproduction, calving, management, etc.;
- the calculation of breeding values;
- the determination of the animal breeding objectives:
  - extension of this breed at district level and in some other mountain districts;
  - protection of the economic interests of farmers breeding this breed;
  - organization of the selling and purchasing market of the animals and their importation;
  - realisation of the technical assistance based on results of milk analyses, feeding of animals, breeding systems in mountain areas, etc.; and
  - it realises milk production and quality contracts of more than 150 cows.

The results of milk control that include analysis of fat and protein content, as well as somatic cell counts are carried out at the UPRA Taranteze-France laboratories (the Zootechnician Research Institute, ZRI, at the quality food control laboratory, carry out analyses for all animal breeds throughout the country). This information is automatically transferred to the associations with all needed conclusions and the right orientations to give technical advice related to feeding, feed control that includes feed planning and feed budgeting.

Qualified advisers create positive technical and economic results. They supply general information of high interest to farmers in order to help themselves and others at all times. They contribute to the increase in general knowledge of the livestock producers. The registration data are used both in the interest of farmers and dairy plants for example, fat and protein content, food consumption, weight gain or other milk data are handled in the interests of the dairy plant and the farmers themselves.

These data are very important to the processing and marketing associations that give information to the development and quality of production. They are valid for the production cost of the product. Based on these costs they decide the prices of the sales (higher sales or higher prices).

The Association handles the interests of the producers in relation to the food industry and prepares the expenditure balance.

- The Association has imported a number of breed animals.
- It organizes some special open days where farmers can exchange their experience for breeding of the animals and feeding, etc.

- It organizes meetings and animal shows or other materials at regional levels or prepares booklets, photographs, programmes on radio or television.
- There is a technical group which supports the Association. It is composed of SBI (Institute of Sheep and Goats) and DBU (Agriculture and Food Department) specialists of the Korea district.

Contacts with research and experimental institutes are considered to be of great importance for the future of the Association. The services provided are continuously improved by incorporating the new knowledge and new technologies. So, it inspires the scientific researchers to undertake projects in the interest of associations. Therefore, the scientific researchers are elected directly by their boards.

Contact with authorities

A number of EU directives and regulations have been adopted to handle livestock production. Some EU directives and regulations are produced according to our conditions. For example, identification and registration of the animals, breeding stocks and pure-bred reproducers in livestock, the control of the animals and their production, artificial insemination, artificial insemination centres, functioning of the pure-bred herd book, requests of the quality of milk, control of mixed feed, feeding additives and intensive production systems, etc.

The Association adopts its systems to the existing requirements of the authorities. It can therefore, handle in the same way the identification system, registration of the animals, herd book keeping, etc., or through a positive dialogue with the authorities, request possible changes.

Authorities on the other hand, reply in time with concrete solutions which have a positive effect on the livestock producers. In this way, correct relations between associations, research institutes and public authorities are created.

- The Association is responsible and creates all the conditions of animal eartagging and insemination of the animals but they are weak. They have no funds and therefore, the State firstly carries out the identification of the farms and the animals in conformity to the ECC 92/102 Directive.

Actually there are about 409 artificial insemination private points. The inseminators keep the following data:
- breed, animal identification;
- all inseminations;
- date of the last insemination;
- data on biological material;
- calving.

Animal identification is made through the use of plastic eartags. Identification and registration systems are based on EU directions and zootechnic service and veterinary and statistic programmes.

The Ministry of Agriculture and Food (MOAF) is in charge of organising and controlling the implementation of the farms and animal identification and registration.

It is MOAF that designs the range of identification of animals and extension of registration in conformity with the funds of the State budget, local authority funds, farmers' participation and other programmes.

The farmers and breed associations, etc., are responsible for the implementation of the identification and registration programmes.

MOAF defines:

- identification code;
- rules and procedures of identification and registration.

The eartagging system is composed of the first two letters of Albania (AL) and nine digits. The number of the district, birth year and the rank of the birth are involved in this official nine-digit eartag.
- e.g. AL 01 - district number;
- 99 - birth year;
- 00001 - individual number.

No later than five days after a calf is born, it is registered in the Association herd book. It is identified no later than 30 days after birth.

- The Association has to preserve the biological material and handle it through all the members of the associations and the other farmers in the area where the spreading of this breed is foreseen;
- it sets up contacts with consumers, informs them on the importance of developing the livestock sector as it is closely linked to feed production, especially to quality and tradition;
- the Association is engaged in the qualification of farmers in the research and experimental institutes and abroad (at ZRI, there are 210 inseminators and other specialists in the framework of the Italian project "Integrate Animal Husbandry" and 15 farmers and inseminators in France, French project);
- a number of articles in local and central organisations of the press are published;
- farmer associations have imported about 190 cows of the Holstein breed and 80 of the Taranteze breed and distributed them in some districts throughout the country. The same can be said for imported semen. Approximately 150 580 doses of semen have been distributed, 30 containers are setting up new AI points, etc.

These associations hope to improve milk and meat production in order to increase farmer incomes.

Financing

The farmers pay their membership fee and will soon pay for:

- concrete services, advice, information, evaluation of breeding stock;
- production fees, etc.

The State supplies a number of projects and has supplied and are continuously supplying the activities and the functioning of most of the associations which gradually take into hand the application of breeding programmes, identification of animals, collection of the production data and herd book keeping, etc.

As we can see, technical and financial support is requested and this should be recognised.

List of participants (in alphabetical order)

Sreten Andonov
Faculty of Agriculture
P.O.Box 297, A. Makedonski bb
91000 Skopje,
Macedonia
E-mail: sandonov@vesta.zsv.ukim.edu.mk

Douglas Batchelor
Vice President of ICAR
46 Westville Road
KT7 OU3 Thames Dittory Surrey,
United Kingdom
E-mail: dmubylass@cs.com

Aida Blanco
Agriculture Ministry
Jose Abascal 4
28003 Madrid,
Spain

Gottfried Brem
VUW
Veterinaerplatz 1
A-1210 Wien,
Austria

Susana Breznik
Minstry for Agriculture, Forestry and Food
Dunajska 56-58
1000 Ljubljana,
Slovenia
E-mail: suzana.breznik@gov.si

Vitomir Bric
Kmetijsko veterinarski zavod Nova Gorica
Pod hrastom 18
5000 Nova Gorica,
Slovenia
E-mail: vitomir.bric-kz@siol.net

Julian Bryan
National Milk Records plc.
Fox Talbot House, Greenways Business Park,
Belling
SN15 1BN Chippenham, Wilsthire,
United Kingdom
E-mail: julianb@nmr.co.uk

Lucijan Cencic
Ministry for Agriculture, Forestry and Food
Dunajska 56-58
1000 Ljubljana,
Slovenia
E-mail: lucijan.cencic@gov.si

Slavko Cepin
Biotechnical Faculty, Zootechnical
Department
Groblje 3
1230 Domzale,
Slovenia
E-mail: slavko.cepin@bfro.uni-lj.si

Marko Cepon
Biotechnical Faculty, Zootechnical
Department
Groblje 3
1230 Domzale,
Slovenia
E-mail: marko.cepon@bfro.uni-lj.si

Vaclav Cermak
Czech - Moravian Breeders' Corporation
Hradistko pod M.
25209 Hradistko,
Czech Republic
E-mail: sppcr@login.cz

Dimitrios Chatziplis
Dept. of Animal Production, Faculty of Agriculture, Aristotle University
Aristotle University of Thessaloniki
54006 Thessaloniki,
Greece
E-mail: chatz@agro.auth.gr

Munir Chaudhry
Livestock Research Institute
Bahadurnagar
Okara,
Pakistan

Liliana Chazo
Asociacion Criadores de Holando Argentino
Laprida 1818
C 1425 EKR Buenos Aires,
Argentina
E-mail: acha@lyris.com.ar

Jurgen Claus
LKV fur Milchwirtschaft Nds-Bre e.V.
Grabenstr. 19
D-27283 Verden,
Germany
E-mail: j.claus@t-online.de

Joseph Crettenand
Schweizerischer Fleckviehzuchtverband
Ruttistrasse
CH-3052 Zollikofen,
switzerland
E-mail: Joseph.Crettenand@swisscattle.com

Vigan Dervishi
Institut de l'Elevage
149, rue de Bercy
F-75595 Paris Cedex 12,
France
E-mail: vigan.dervishi@inst.elevage-asso.fr

Marta Dianova
State Breeding Institute of the Slovak Republic
Starohajska 29
85227 Bratislava,
Slovak Republic
E-mail: spusrba@mail.viapvt.sk

Fikret Dizdarevic
Poljoprivredni fakultet Sarajevo
7. maja od Bosne 8
71000 Sarajevo,
Bosna-Hercegovina

Lubomir Dobrovic
State Breeding Institute of the Slovak Republic
Starohajska 29
85227 Bratislava,
Slovak Republic
E-mail: lubomir.dobrovic@mail.viapvt.sk

Claudia Doering
GGI German Genetics International GmbH
Am Osterfeld 14
D-49661 Cloppenbuerg,
Germany
E-mail: info@ggi.de

Reiner Donndorf
Landeskontrollverband Brandenburg e.V.
Strasse zum Roten Luch 1
D-15377 Waldsieversdorf,
Germany

Marjana Drobnic
Biotechnical Faculty, Zootechnical Department
Groblje 3
1230 Domzale,
Slovenia
E-mail: marjana.drobnic@bfro.uni-lj.si

Philippe Dubouix
Allflex Europe
17, rue Tronchet
F-75008 Paris,
France

Jean Francois Duckerts
Ministere Classes Moyennes et de l'Agriculture/Elevage
Rue des Champs Elysees, 12
B-5590 Ciney,
Belgium

Edward Dymnicki
Institute of Genetics and Animal Breeding
Postepu 1, Jastrzebiec
05-551 Mrokow,
Poland

Vladimir Dzabirski
Faculty of Agriculture
P.O.Box 297, A. Makedonski bb
91000 Skopje,
Macedonia
E-mail: vdzabirski@vesta.zsv.ukim.edu.mk

Emil Erjavec
Biotechnical Faculty, Zootechnical Department
Groblje 3
1230 Domzale,
Slovenia
E-mail: emil.erjavec@bfro.uni-lj.si

Miljenko Ernoic
Croation Center for Selection and Animal Breeding
Kaciceva 9/III
10000 Zagreb,
Croatia

Jani Fabrizio
Kmetijsko veterinarski zavod Nova Gorica
Pod hrastom 18
5000 Nova Gorica,
Slovenia
E-mail: jani.fabrizio-kz@siol.net

Sean Fitzgerald
Pedigree Cattle Breeders Council of Ireland
Farmleigh, Castelenock, Co.
Dublin,
Ireland

Philipp Furst zu Solms-Lich
Arbeitsgemeinschaft Deutscher Rinderzuchter
Adenauerallee 174
D-53113 Bonn,
Germany
E-mail: klaus.meyn@adt.de

Mabrouk Garrouri
Office de l'Elevage et des Paturages
30 Rue Alain Savary
Tunis,
Tunisie

Vaclava Gencurova
Research Institute for Cattle Breeding, Ltd., Rapotin
Vyzkumniku 267
78813 Vikyrovice,
Czech Republic
E-mail: vuchs_rapotin@ova.pvtnet.cz

Andreas Georgoudis
Dept. of Animal Production, Faculty of Agriculture
Aristotle University of Thessaloniki
54006 Thessaloniki,
Greece
E-mail: andgeorg@agro.auth.gr

Janez Glavac
Ministry for Agriculture, Forestry and Food
Dunajska 56-58
1000 Ljubljana,
Slovenia
E-mail: janez.glavac@gov.si

Abraham F. Groen
Animal Breeding & Genetics Group, Wageningen
P.O. Box 338
6700 AH Wageningen,
The Netherlands
E-mail: Ab.Groen@alg.wag-un.nl

Mustapha Guellouz
Office de l'Elevage et des Paturages
30 Rue Alain Savary
Tunis,
Tunisie

Franc Habe
Biotechnical Faculty, Zootechnical Department
Groblje 3
1230 Domzale,
Slovenia
E-mail: franc.habe@bfro.uni-lj.si

Manfred Hammel
Landeskontrollverband Brandenburg e.V.
Strasse zum Roten Luch 1
D-15377 Waldsieversdorf,
Germany
E-mail: lkv@lkv-bb.de

Ole Klejs Hansen
National Committee on Danish Cattle Husbandry
Uokaersvej 15
8200 Aarhus N,
Denmark
E-mail: okh@lr.dk

Oto Hanuš
Research Institute for Cattle Breeding, Ltd., Rapotin
Vyzkumniku 267
78813 Vikyrovice,
Czech Republic
E-mail: vuchs_rapotin@ova.pvtnet.cz

David Hewitt
Holstein UK & Ireland
Scotsbridge House, Scots Hill
WD3 3BB Rickmansworth, Herts,
United Kingdom
E-mail: davidhewitt@holstein-uki.org

Ljiljana Husinec
Croation Center for Selection and Animal Breeding
Kaciceva 9/III
10000 Zagreb,
Croatia

Kaivo Ilves
Agricultural Registers and Information Centre
1 Kreutzwaldi Str.
50094 Tartu,
Estonia
E-mail: kaivo@reg.agri.ee

Slavko Janzekovic
Obdravski zavod za zivinorejo
Ormoška 28
2250 Ptuj,
Slovenia
E-mail: slavkoj@ozvz-ptuj.si

Marjan Jasnic
Kmetijsko veterinarski zavod Nova Gorica
Pod hrastom 18
5000 Nova Gorica,
Slovenia
E-mail: marjan.jasnic-kz@siol.net

Laurent Journaux
Institut de l'Elevage
149, rue de Bercy
F-75595 Paris Cedex 12,
France
E-mail: laurent.journaux@inst.elevage-asso.fr

Sonja Jovanovac
Poljoprivredni fakultet Osijek
Trg sv. Trojstva 3
31000 Osijek,
Croatia

Heiko Jurgens
LKV Weser - Ems (ADR - Bonn, D)
Mars-la-Tour-Strasse 6
D-26121 Oldenburg,
Germany
E-mail: lkv-we@lkv-we.de

Klavdija Kancler
Kmetijsko veterinarski zavod Nova Gorica
Pod hrastom 18
5000 Nova Gorica,
Slovenia
E-mail: klavdija.kancler-kz@siol.net

Miroslav Kapš
Faculty of Agriculture, University of Zagreb
Svetošimunska c. 25
10000 Zagreb,
Croatia

Tatsuya Kazama
Livestock Improvement Association of Japan, Inc.
1-19-8, Kyobashi, Chnon-ku
104-0031 Tokyo,
Japan
E-mail: kazama@liaj.lin.go.jp

M. Sajjad Khan
Dept. Animal Breeding, Agricultural University
Faisalabad
Faisalabad,
Pakistan
E-mail: drsajjad@fsd.paknet.com.pk

Sergeij Kharitonov
All Russian Research Institute of Animal Breeding
Lesnye Polyany Pushkin district
141212 Moscow,
Russian Federation
E-mail: 6110.g23@g23.relcom.ru

Davood Kianzad
Animal Breeding Centre
P.O. Box 31585-963
31585 Karaj,
Iran

Aleksandar Kljujev
Croation Center for Selection and Animal Breeding
Kaciceva 9/III
10000 Zagreb,
Croatia

Marija Klopcic
Biotechnical Faculty, Zootechnical Department
Groblje 3
1230 Domzale,
Slovenia
E-mail: marija.klopcic@bfro.uni-lj.si

Christophe Klopp
Institut de l'Elevage
Centre INRA, Chemin de Borde, Rouge Bpis
F-31320 Castanet - Tolosan,
France

Marko Kobe
Ministry for Agriculture, Forestry and Food
Dunajska 56-58
1000 Ljubljana,
Slovenia
E-mail: marko.kobe@gov.si

Drago Kompan
Biotechnical Faculty, Zootechnical Department
Groblje 3
1230 Domzale,
Slovenia
E-mail: drago.kompan@bfro.uni-lj.si

Agu Koop
State Animal Breeding Inspection
Lai 39/41
10133 Tallinn,
Estonia
E-mail: agu.koop@agri.ee

Viktor Krek
Ministry for Agriculture, Forestry and Food
Dunajska 56-58
1000 Ljubljana,
Slovenia
E-mail: Viktor.Krek@gov.si

Dorota Krencik
Central Animal Breeding Office
Sokolowska 3
01-142 Warsaw,
Poland
E-mail: cshz@perytnet.pl

Peter Kunstelj
Zivinorejsko veterinarski zavod Gorenjske
Iva Slavca 1
4000 Kranj,
Slovenia

Esmira Lafitova
Livestock Selection and Pasture Dept.
40 Uz. Haiibevou str.
370016 Baku,
Azerbaijan
E-mail: gasimov@azeurotel.com

Vassili Lavrovski
Timiryazev Agricultural Academy
Timiryazevskaya 49
127550 Moscow,
Russian Federation

Olivier Leray
CECALAIT/Institut de l'Elevage
INRA, 89, Place du champ de Foire
F-39801 Poligny Cedex,
France
E-mail: leray@poligny.inra.fr

William Luff
World Guernsey Cattle Federation
The Hollyhocks, 10 - Clos des Goddards
GY5 7JD Castel, Guernsey,
Guernsey, Channel Islands
E-mail: wgcf@guernsey.net

Juhani Maki-Hokkonen
FAO, Animal Production and Health Division
Via le delle Terme di Caracalla
I-00100 Rome,
Italy
E-mail: juhani.makihokkonen@fao.org

Joško Marovt
Zivinorejsko veterinarski zavod Celje
Trnovlje 181 a
3000 Celje,
Slovenia

Gyula Meszaros
Livestock Performance Testing Ltd.
Tessedik Samuel n. 4
H-2100 Godollo,
Hungary
E-mail: gymeszaros@atkft.hu

Klaus Meyn
Arbeitsgemeinschaft Deutscher Rinderzuchter
Adenauerallee 174
D-53113 Bonn,
Germany
E-mail: klaus.meyn@adt.de

Stefan Mihina
Research Institute for Animal Production
Hlohovska str. 2
94992 Nitra,
Slovak Republic
E-mail: mihina@vuzv.sk

Paul Miller
National DHIA
3021 E.Dublin-Granville Road
43231 Columbus - Ohio,
USA
E-mail: pdmil@aol.com

Krystyna Morawska-Codogni
Central Animal Breeding Office
Sokolowska 3
01-142 Warsaw,
Poland
E-mail: cshz@perytnet.pl

Jiri Motycka
Black and White Cattle Breeder's Association
U Topiren 2
17041 Prague 7,
Czech Republic

Salko Muratovic
Poljoprivredni fakultet Sarajevo
7. maja od Bosne 8
71000 Sarajevo,
Bosna-Hercegovina

Toomas Murulo
Agricultural Registers and Information Centre
1 Kreutzwaldi Str.
50094 Tartu,
Estonia
E-mail: toomas@reg.agri.ee

W.R. Nagle
Irish Dairy Records Co-op
4A St. Joans, Red Cow
22 Dublin,
Ireland
E-mail: idrc@iol.ie

Karoly Neszmelyi
National Institute for Agricultural Quality Control
Kelety Karoly u. 24
H-1024 Budapest,
Hungary

Bernd Neusch
H. Hauptner und Richard HERBERHOLZ GmbH & Co. KG
Kuller Str. 38-44
D-42651 Solingen,
Germany
E-mail: gf@hauptner-herberholz.de

Seppo Niskanen
The Finnish Animal Breeding Association
P.O. Box 40
1301 Vantaa,
Finland
E-mail: seppo.niskanen@faba.fi

Victor Olori
Irish Cattle Breeding Federation
Shinagh House, Bandon
Co. Cork,
Ireland
E-mail: volori@icbf.com

Joze Osterc
Biotechnical Faculty, Zootechnical Department
Groblje 3
1230 Domzale,
Slovenia
E-mail: joze.osterc@bfro.uni-lj.si

Reinhard Pauw
Landeskontrolverband Rheinland
Endevicher Allee 64
D-53115 Bonn,
Germany
E-mail: pauw@lkv-rheinland.de

Kalle Pedastsaar
Agricultural Registers and Information Centre
1 Kreutzwaldi Str.
50094 Tartu,
Estonia
E-mail: kalle@reg.agri.ee

Tzonka Peeva
Buffalo Research Institute
9800 Shumen,
Bulgaria
E-mail: svetla_stoeva@hotmail.com

Aire Pentjarv
Agricultural Registers and Information Centre
1 Kreutzwaldi Str.
50094 Tartu,
Estonia
E-mail: aire@reg.agri.ee

Tomaz Perpar
Kmetijski inštitut Slovenije
Hacquetova 17
1000 Ljubljana,
Slovenia
E-mail: Tomaz.Perpar@KIS-H2.si

Neil Petreny
Canadian Milk Recording Board
150 Research Lane, Swite 200
N1H 7E2 Guelph, Ontario,
Canada
E-mail: petreny@ontdhi.ca

Pavla Plesnicar
Kmetijsko veterinarski zavod Nova Gorica
Pod hrastom 18
5000 Nova Gorica,
Slovenia
E-mail: pavla.plesnicar-kz@siol.net

Marijan Posavi
Faculty of Agriculture, University of Zagreb
Svetošimunska c. 25
10000 Zagreb,
Croatia

Eduard Pravnansky
State Breeding Institute of the Slovak Republic
Starohajska 29
85227 Bratislava,
Slovak Republic
E-mail: spusrba@mail.viapvt.sk

Sandor Prokai
Livestock Performance Testing Ltd.
Tessedik Samuel n. 4
H-2100 Godollo,
Hungary
E-mail: prokai@atkft.hu

Pal Rafai
Faculty of Veterinary Science
Istvan u. 2
H-1078 Budapest,
Hungary
E-mail: prafai@univet.hu

Norbert Ratheiser
Bundesministerium fur Land- und Forstwirtschaft
Stubenring 1
A-1180 Wien,
Austria
E-mail: norbert.ratheiser@bmlf.gv.at

Erik Rehben
Institut de l'Elevage
149, rue de Bercy
F-75595 Paris Cedex 12,
France
E-mail: erik.rehben@inst.elevage-asso.fr

Katrin Reili
Agricultural Registers and Information Centre
1 Kreutzwaldi Str.
50094 Tartu,
Estonia
E-mail: katrin@reg.agri.ee

Matija Rigler
Kmetijski zavod Ljubljana
Miklošiceva 4
1000 Ljubljana,
Slovenia

Jan Riha
Research Institute for Cattle Breeding, Ltd., Rapotin
Vyzkumniku 267
78813 Vikyrovice,
Czech Republic
E-mail: vuchs_rapotin@ova.pvtnet.cz

Andrea Rosati
Associazione Italiana Allevatori
Via Nomentana 134
I-00162 Rome,
Italy
E-mail: rosati.a@aia.it

Goran Roxstrom
ALFA LAVAL AGRI AB
P.O. Box 39
14721 Stockholm,
Sweden
E-mail: goran.roxstrom@mail.alagri.com

Štefan Ryba
State Breeding Institute of the Slovak Republic
Starohajska 29
85227 Bratislava,
Slovak Republic
E-mail: spusrba@mail.viapvt.sk

Andrej Šalehar
Biotechnical Faculty, Zootechnical Department
Groblje 3
1230 Domzale,
Slovenia
E-mail: andrej.salehar@bfro.uni-lj.si

Reza Schahidi
Vet.Med. Colage University of Teheran
P.O. Box 19395-3789
19395 Teheran,
Iran
E-mail: rschahidi@chamran.ut.ac.ir

Werner Schlote
Humboldt Universitat zu Berlin
Lentzeallee 75
D-14195 Berlin,
Germany
E-mail: werner.schlote@rz.hu-berlin.de

Sandor Sebestyen
National Institute for Agricultural Quality Control
Kelety Karoly u. 24
H-1024 Budapest,
Hungary

Lionel Sheridan
ALLFLEX Australia
931 Tremaine Avenue
PB 11003 Palmerston North,
New Zealand
E-mail: lionel@allflex.co.nz

Karmen Sinkovic
Croation Center for Selection and Animal Breeding
Kaciceva 9/III
10000 Zagreb,
Croatia

Dani Skaza
Obdravski zavod za zivinorejo
Ormoška 28
2250 Ptuj,
Slovenia
E-mail: danis@ozvz-ptuj.si

Janko Slavic
Zivinorejsko veterinarski zavod Murska Sobota
Štefana Kovaca 50
9000 Murska Sobota,
Slovenia

Diedrich Smidt
Pfennigsmoorweg 11
D-30826 Garbsen - Frielingen,
Germany
E-mail: diedrich.smidt@t-online.de

Thomas Soderlund
ALFA LAVAL AGRI AB
P.O. Box 39
14721 Stockholm,
Sweden
E-mail: thomasper.soderlund@mail.alagri.com

Hans Solkner
Department of Livestock Science, University of Agricultural Sciences
Gregor-Mendel Strasse 33
A-1180 Wien,
Austria

Franc Šonaja
Zivinorejsko veterinarski zavod Murska Sobota
Štefana Kovaca 50
9000 Murska Sobota,
Slovenia

Marjan Špur
Zivinorejsko veterinarski zavod Murska Sobota
Štefana Kovaca 50
9000 Murska Sobota,
Slovenia

Jean Stoll
Federation des Herd-Books Luxembourgeois
B.P. 313
9004 Ettelbruck,
Luxembourg
E-mail: fhl@pt.lu

Arunas Svitojus
Rural Business Development and Information Center
Kudirkos 18
2600 Vilnius,
Lithuania
E-mail: arunas@vic.lt

Nagi Tahiraj
Ministry of Agriculture
Tirana
Tirana,
Albania

Gavin Thompson
Bentley Czech s.r.o.
Kluchova 18b
63400 Brno,
Czech Republic
E-mail:
GavinThompsonTTCE@compuserve.com

Duncan Todd
Livestock Services (UK)
46, Underwood Road
PA3 1TJ Paisley,
Scotland
E-mail: dtodd@lsuk.demon.co.uk

Mart Uba
Agricultural Registers and Information Centre
1 Kreutzwaldi Str.
50094 Tartu,
Estonia
E-mail: mart@reg.agri.ee

Donata Uchockiene
Association of Lithuanian Holstein Cattle Breders
Kalvarijos G. 128
3018 Kaunas,
Lithuania
E-mail: donatau@litgenas.lt

Ivana Valjavec
Ljubljanske mlekarne
Tolstojeva 63
1000 Ljubljana,
Slovenia
E-mail: IvankaV@lj-mlek.si

Robert A. van der Laan
Y-TEX Corporation USA, c/o BLS Dernier B.V.
Postbus 20
NL-5830 AA Boxmeer,
The Netherlands
E-mail: r.van.der.laan@bls.nl

Pierre Van Rooyen
S.A. Stud Book and Livestock Improvement Association
P.O. Box 270
9300 Bloemfontein,
South Africa
E-mail: pierre@studbook.co.za

Nguyen van Thu
HUV, SLU
P.O. Box 7024
S-750 07 Ultuna,
Sweden
E-mail: Nguyen.van.thu@huv.slu.se

Tiina Vares
Food and Agriculture Organization, FAO
Benzur utca. 34
H-1068 Budapest,
Hungary
E-mail: tiina.vares@fao.org

Maja Vilfan
Ministry for Agriculture, Forestry and Food
Dunajska 56-58
1000 Ljubljana,
Slovenia
E-mail: maja.vilfan@gov.si

Nikolaus von Croy
Allflex Europe
Borweg 15a
D-22303 Hamburg,
Germany

Gregoire Wambergue
Allflex Europe
17, rue Tronchet
F-75008 Paris,
France

Philippe Waucomont
LINALUX aedb asbl
41, Rue de la Cle
B-4650 Herve,
Belgium
E-mail: pwaucomont@linalux.be

Daniel Webb
University of Florida
P.O. Box 110920
32611-0920 Gainesville FL,
USA
E-mail: webb@dps.ufl.edu

Wim M.G. Wismans
AMSO
Oud Zevenaarsedijk 19
6905 BJ Oud Zevenaar,
The Netherlands
E-mail: wim.amso@hetnet.nl

Milan Zjalic
ICAR
Via Nomentana 134
I-00162 Roma,
Italy
E-mail: milan@eaap.org

Mira Zupanc - Kos
Ministry for Agriculture, Forestry and Food
Dunajska 56-58
1000 Ljubljana,
Slovenia
E-mail: mira.zupanc@gov.si