

Identification and registration of animals in the European Union

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Abstract

This paper describes the relevant requirements for a national identification and registration system, covering all animals and with tracing ability for all animals. In detail is given information about the regulations, the identification methods, the registration of movements, the database, the quality control and the costs. Special attention is given to having practical regulations and to building a simple system that is usable for all purposes. © 1999 Elsevier Science B.V. All rights reserved.

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1. 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 world-wide 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 prescribe more and more in detail the conditions for an I&R system to guarantee healthy and safe products for consumers (Hobo, 1998). Sometimes the regulations prevent to build up a practical system which can easily be controlled. The conditions for the use of RFID (radiofrequency identification) in the I&R systems are nearly fulfilled and the use of RFID in identification programs will increase.

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The European Union (EU) has issued a regulation for tracing the origin and the movements of a particular animal. It will enable farm livestock to be traced at the outbreak of diseases and residues in slaughtered animals to be followed up. As an aid to livestock farming the EU also gives subsidies depending on number, age and other requirements, to farms with cattle, sheep and goats. As the determination of the numbers of animals is difficult, the Commission is aware of the possibility of fraud. A good identification and registration system can help to minimise this fraud.

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 in Directive 92/102/EEC 'On the identification and registration of animals'.

Before 1992 only I&R regulations for purebred animals were in force. Animal health regulations for transport and import have existed since 1964 (Wilmink, 1997).

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

Herdbooks for dairy cattle have registered animals for more than a hundred years. The animals were identified individually and only records on breeding were registered. In the 1950s several countries started to identify animals for animal health programs. These two systems were different and today in many countries two systems still exist, which is a big disadvantage. Having more systems is less farmer-friendly, more expensive and the quality of the systems is lower.

At the moment in Europe in a number of countries, only for cattle, national I&R systems exist based on individual identification of all animals. Outside Europe the use of a national I&R system for animal health is still not common; since the 1990s some countries have been implementing such a system for cattle.

Many identification methods are in use, such as eartag, tattoo, ear-notching, branding, paint marking, RFID (injectable, eartag and bolus), or any combination of these. Today cattle can only be identified by eartags in the EU. It is foreseen that transponders can be used after the year 2000 in national programs. Transponders are used already for companion animals, zoo animals and endangered species and horses. For farm management, automatic feeding and data recording, electronic identification has been in use since the 1970s (Eradus and Rossing, 1994). The expectation is that in the future the use of eartags and transponders are the most important identification methods in national identification programs for farm animals and of course will be used for farm management.

2. EU regulations

In 1992 the first regulation, the EU Directive 92/102/EEC of 27 November, came into force. Keepers of farm animals were required to maintain up to date records

of the animals of their holdings; records must be held of the movements of animals and the competent authority in Member States must have access to the records on request.

The most important points in the EU Directive 92/102/EEC 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 tamper-proof and easy to read during the animal's 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 re-marked 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 3 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.

An important aspect of the I&R system is the unique identification of the holdings and individual numbers given to animals (for cattle this is a must) must be unique nationwide. By adding the ISO country code (ISO standard 3166) the animal number is unique worldwide. In the directive is said for cattle that the animal is identified with an eartag with a unique code which makes it possible to identify each animal individually together with the holding on which it was born. This text many times is misinterpreted in the way that the holding number should be included in the animal number. This is not the case. It is a must to record the holding of birth. Countries may decide to use the holding number as a part of the individual animal number but it is best not to include any elements in the animal number. The ordering and logistic of the eartags is easier and the same numbering system can be used in all cases (eartag, transponder, etc.).

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

- January 1998: 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 at least should be available for 3 years.

- September 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 a passport has only to be issued and used by 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.
- September 1998: all animals except slaughter animals for export have to be identified in accordance with the regulation.
- September 1999: also slaughter animals have to be identified in accordance with the regulation.
- January 2000: marking of calves must be done within 20 days and reporting of birth and movements within 7 days; a national database should be operational in the Member States; labelling of meat to be exported must be labelled and a decision about electronic identification will be taken,

The EU has issued Commission Regulations, which lay down the detailed rules for the implementation of Council Regulation No. 820/97. These are:

- Commission Regulation EC No. 2628/97 of 29 December 1997: ‘Transitional provisions for the start-up period of the system for the identification and registration of bovines’.
- Commission Regulation EC No. 2629/97 of 29 December 1997: ‘Eartags, holdings registers and passports’.
- Commission Regulation EC No. 2630/97 of 29 December 1997: ‘Minimum levels of controls to be carried out for the identification and registration of bovine animals’.
- Commission Regulation EC No. 494/98 of 27 February 1998: ‘Application of minimum administrative sanctions in the framework of the system for the identification and registration of bovine animals’.

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:

1. Labelling must be done in accordance with the Title of 820/97.
2. Only approved operators or organisation by the competent authority may label meat.
3. Only information which can be easily checked at the point of sale may be printed in the label.
4. 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.

5. The name or logo of the approved operator or organisation must be given on the label.
6. Withdraw of approval or imposing supplementary conditions.
7. A compulsory beef-labelling system will be obligatory in all Member States from 1 January 2000 onwards and before this date the Commission will take a decision about the rules for the compulsory system.
8. Member States with a functional I&R system for bovine animals may impose before 2000 a compulsory labelling system.
9. Member States have to inform the Commission about the implementation of the labelling system for beef.

3. Guidelines for national I&R systems

The International Committee for Animal Recording (ICAR), founded in 1953 as a European organisation and developed to a world organisation, has international guidelines for the identification and performance recording of farm animals. More than 45 countries worldwide are members of ICAR. Member organisations have to fulfil the guidelines. It is important that legal bodies as EU accept ICAR as the international body for guidelines and standards for farm animals because physical borders for trade will disappear more and more and the World Trade Organisation (WTO) will determine the conditions for trade. In the EU directives is already said that the performance recording should be done in conformance with the guidelines of ICAR and Interbull, a Sub-Committee of ICAR, is the EU reference centre for the genetic evaluation of animals. ICAR approves equipment, methods, material, etc., to be used for identification and performance recording. ICAR has a liaison with IOS and within this liaison is agreed that ICAR is responsible for the manufacturers code in the code structure of transponders (ISO 11784). ICAR prepares a document for the approval of eartags and a document for the approval of transponders. Both documents can become officially end of 1998. Devices will be 'world' approved and remarking after import can disappear.

Before developing an I&R system the requirements should be agreed on. 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 has 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.

The outbreak of diseases and increasing demand of consumers for safe products requires a chain control from birth to the butcher or supermarket (Hobo, 1998). Whereas the purposes for I&R systems have been described, i.e. farm management, animal health, animal breeding, control of subsidies and for purposes of trade, it is recommended that any I&R system should be appropriate to the requirements of the species (Wilmink, 1997; Wismans, 1992). Based on the requirements of Copa/Cogeca in 1996 and taken in consideration the quality assurance aspects the requirements for a national practical I&R system today are:

- Veterinary and zootechnical checks.
- Breeding including performance recording.
- Farm management.
- Premiums.
- Hormones and residue control.
- Quality control on meat production including labelling of meat.

Important for every system but specially for an I&R system is that the system is:

- Simple and practical.
- Cost effective.
- Based on international standards.
- Usable for all relevant purposes.
- Quality control is possible at all levels.

The history has taught that it is not easy to fulfil the above conditions. The first three conditions are common and acceptable for everybody. The last two conditions are difficult ones and create a lot of discussion. Compromises on the last two conditions are obstructing a simple and cheap I&R system. To what extent the existing systems fulfil these conditions can be questioned.

Until recently the requirements of an I&R system were only based on purposes during the life of the animals. The fact that the consumer 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.

1. Regulations do not and must not prescribe any elements in the identity code of animals and also not in the identity code of holdings.
2. The same code structure is used for all identification methods within species and within countries.
3. For international registration purposes where unique identification is stipulated, the ISO standard ISO 11784 must be used to make the registration number unique in the world. The numeric country code must be used in the registration system (computer). On papers and eartags the two alpha character country code shall be used.
4. Each country is responsible for providing a unique identification system for animals and a unique identification system for holdings within its border.
5. Each country must provide identification systems for all stock according to their species. (at least unique per animal for cattle and by herd or flock for pigs, sheep and goats).
6. Where imported animals receive a new individual ID code the detail of its original identity code must also be recorded and a link between the two established.
7. On documents for international use the new ID code and original registration details of an animal must always be given.
8. The registration number of an animal does not have to correspond to the mark (ID code) applied to the animal itself (e.g. eartag, tattoo, transponder, etc.). Where they differ, however, a link between these two identification details must be made in the computer system.

9. If electronic ID is used, identification visible to the naked eye must be used for international trade.
10. A national database is used to support the system.
11. The basic data (birth, pedigree, herd) in the national database are available to the competent authorities for animal health and for premiums and to all approved breeding organisations (artificial insemination (AI), herdbook and performance recording).
12. If electronic exchange of data is done an international accepted standard shall be used.
13. By labelling of meat there must be a link between the unique number of the animal and the identification number of the meat.

4. Identification methods and EU IDEA trial

In the past many methods for the identification of animals are used. In the future only eartags and transponders and may be new techniques will be used in official national programs. A new technique can be the use of DNA fingerprinting for all animals. This technique is now used in some countries for the control of the pedigree of animals.

For identification devices it is very important that the device can be easily attached or brought into the animal with no harm for the animal. The design will remain at its place, be tamperproof and easy to read during the lifetime of the animal.

Within the EU it is not allowed for cattle to retag an animal. This request that Member States should only use EU accepted eartags. Better is, because the international trade, only international approved ID methods may be used. ICAR takes care for this (eartags and transponders).

In the agriculture sector the use of transponders in national I&R systems is not allowed. This will change in short time and certain on the moment the IDEA project of the EU will show the usefulness of RFID in national I&R systems (Geers et al., 1997). In the IDEA project the following will be investigated:

- The application technique.
- Losses during animal life.
- Reliability under practical conditions.
- Methods for static and dynamic readings.
- The method for recovering in the slaughterhouse.
- The data recording and organisation of the administration.
- Feasibility of practical implementation.

Six EU Member States (Spain, France, Germany, Italy, Portugal and The Netherlands) are involved in the project. In total about 1 million animals (bovines 48%, ovine 49% and goats 3%) will be identified by bolus (72%), electronic eartag (23%) or injectable (5%). The total costs for the project are about 22.5 million ECUs. The project started in 1998 and will last for 3 years.

Some European Countries (Austria, Belgium, Finland, France, parts of Germany, Luxembourg, Portugal and Spain) use a barcode on the eartag for automatic reading, specially for the slaughterhouses. Until now is used the barcode system 'interleaved 2 of 5'. In discussion is to change to the standard code 128 or EAN code 128 to include the country code in the barcode and to have a better link with the processing of meat.

5. Registration of all movements

To have a system which guarantees that 100% tracing of all animals is possible, the movements of the animals have to be registered. Beneath the possibility of tracing it is a very good tool for controlling the system. The EU is requesting (1999) to report the movements at least within 7 days, which is a good limit in the regulation. Practical is to ask the farmers and traders to report as much as possible the same day and offer electronic possibilities to report. The use of a voice response system (having a good telephone system in the country) and of course the data commination by PCs is possible. When the outgoing and the incoming animals are registered individually in the database, the database can report easy about missing reports in the system. In this context it is good to realise that the use of the I&R system by breeding organisations also detects missing reports. When breeding and other organisations use the same system it must not be possible for these organisations to change the data in the I&R system. To change data on identification and registration should only be possible by the I&R system and this system creates automatically updates for the other systems.

When tracing is necessary there are two main functions:

1. On which holdings, market places, etc., and for what period the animal has been.
2. Which animals where on the same moment on the same holding.

6. Database

Without the support of a database it is not possible to establish a good function national I&R system. The EC is requesting for the Member States to have a database operational on 1 January 2000 (Wismans, 1995). Some countries have already long and positive experiences with a database. Certainly in The Netherlands the database has showed its importance. Today the total (including tracing, eartags, database, communications etc) costs for the I&R system in 1998 are the same as in 1992 when only 50% of the cattle (veal calves and beef animals were not recorded) was identified and recorded in the database.

In the database should be recorded at least:

- Identification code.
- New identification code when different.
- Registration number (lifetime administrative number) when different.

- Registration 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. Today the slaughterhouses, retailers and supermarkets use the EAN standard EANCOM. Discussed and decided should be which protocol to use or databases should communicate by using one of the two protocols.

7. Quality control

Quality control becomes more and more important. Two aspects have to be considered:

1. The (administrative) process control as is done by the ISO 9000 standards.
2. Product quality.

The ISO standards will not be discussed in this paper. Product quality, which means the quality of the data is essential for a good function national I&R system. EU is also asking to carry out quality checks and also ICAR is asking for this. By the database several checks can be carried out for no extra costs. Further is important to visit the holdings where the identification is carried out, traders, markets, slaughterhouses, etc.

8. Costs

It is difficult to compare the costs of I&R systems worldwide. It is known that there are big differences both for total systems or part systems (herdbooks). When is decided to built a national I&R system mostly there is a new concept and considered is to bring down the costs as much as possible. It is possible and a must for farm animals the farmer carries out the identification of the animals and is responsible for travel documents. Using the basic data for many purposes creates less cost per purpose. In The Netherlands the I&R system for cattle, build in 1993, costs the same as the system before but the number of animals registered has doubled and covers 100% of the cattle. In 1997 the total costs (eartags, database,

import and export, control, etc.) per animal are 3.5 ECU per year and additional herdbook registration (including a registration card etc.) is done for 2.25 ECU per calf.

9. 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 a going on process (new, sometimes complex, developments and further internationalisation of our activities) and new regulations become more and more strictly to enlarge the confidence of the consumer in meat and meat products. It is a challenge to keep the regulations practical and to build a simple system for low costs. Co-operation between countries to improve the system and bring down the costs is another great challenge. In the near future electronic identification will be used in national I&R systems.

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