

The implementation of traceability systems

S. Ammendrup⁽¹⁾ & L.O. Barcos⁽²⁾

(1) Danish Veterinary and Food Administration, Region East, Soendervang 4, DK-4100 Ringsted, Denmark

(2) Regional Representation of the World Organisation for Animal Health (OIE) for the Americas, Cerviño 3101 2°, 1425 Buenos Aires, Argentina

Summary

Traceability is a tool to help countries meet their objectives of controlling, preventing and eradicating animal diseases. This article sets out the required steps in a traceability system.

Before designing a system of traceability, one must identify the different characteristics that need to be traced throughout the various steps in the food production chain. The interaction between different sectors in defining the objectives and the resulting needs of a traceability system is fundamental. A clear legal framework is also indispensable.

European Union (EU) legislation requires identification and registration for cattle, pigs, sheep and goats. For intra-EU trade these animals must be accompanied by a health certificate providing information on their identity and health status. The required identification is harmonised on an EU-wide basis with the aim of ensuring traceability for veterinary purposes. Furthermore EU legislation requires that the traceability of food, feed and food-producing animals be established at all stages of production.

Keywords

Animal identification – Cattle – European Union – Goat – Passport – Pigs – Sheep – Traceability.

Introduction

Before we can consider the implementation of animal identification and traceability in the field certain concepts need to be clarified.

Traceability is not an end in itself, but rather a tool or concept which, in certain circumstances, may be used to gather information, or verify the accuracy of existing information where appropriate, and to carry out surveillance, isolation or even destruction of products or animals in the framework of public health (food safety) or animal health measures (1).

The objectives of a traceability system must be clearly defined, and their scope must be broad, since Veterinary Services work with many animal species and the foodstuffs derived therefrom. Thus, if we are required to trace a piece

of meat from the plate to the farm or animal of origin, how extensive does traceability need to be to cover the case of a hamburger, or pieces of chicken (2)?

What the authors are trying to say is that the approach to traceability must be an integrated approach: the point is not merely to trace a product from the plate back to the animal of origin, but to cover all the related processes, to record, recover and analyse all the information required to meet specific objectives, e.g. the prevention of disease, the acquisition of health certificates, etc. (1, 2, 3, 4, 20).

Whatever the specific objectives, animal species, system or country may be, there is a series of factors that are common to all situations, and that must be considered when developing a traceability system, such as legislation, standards, procedures and the competent authority (27).

Moreover, the identification of animals, primary and industrial production sites, diagnostic laboratories and the various components of the traceability system chosen is indispensable. Each of these elements must be identified using the most appropriate system available (1, 2, 24).

As we look at the basic elements of a system of animal identification and traceability, we become aware that many of the requisite components are often already in place, since all countries that take animal health measures, and that therefore have operational surveillance systems, are implementing some form of identification and traceability (1, 2, 24, 27).

For traceability systems to be properly implemented or improved in the various countries, a clear distinction must be drawn between identification and traceability, and between objectives or missions and the instruments needed to carry them out (1, 2, 4, 27).

Since 1964 European Community (EC) legislation has included provisions for the identification and registration of live animals. Council Directive 64/432/EEC on animal health problems affecting intra-Community trade in bovine animals and swine (8) requires animals to be identified for certification purposes. This Directive also refers to the creation of computer databases for bovine and porcine animals to store information on animals and their movements. Community rules for the control of classical swine fever and foot and mouth disease were laid down in 1980 (Council Directive 80/217/EEC [9]) and in 1985 (Council Directive 85/511/EEC [10]), respectively. These rules included provisions for monitoring movements of animals which were essential to prevent any spread of disease in the event of an outbreak. However, the detailed arrangements for identifying the animals or for tracing the holding of origin were to be determined by the competent authority of the Member State involved. These directives had been substantially amended over the years to take account of developments and were replaced by the 2001 Council Directive 2001/89/EC (15) on classical swine fever and the 2003 Council Directive 2003/85/EC (17) on foot and mouth disease.

In 1990, with a view to the completion of the internal market, the Council adopted Directive 90/425/EEC (11), which laid down rules concerning veterinary and zootechnical checks applicable in intra-Community trade in certain live animals. According to these rules animals must be identified in accordance with Community rules and be registered in such a way that the original or transit holding, centre or organisation can be traced.

Community rules on identification and registration of bovine, porcine, ovine and caprine animals were laid down in 1992 (Council Directive 92/102/EEC [12]). The two basic objectives of these rules were:

a) the localisation and tracing of animals for veterinary purposes, which are of crucial importance for the control of contagious diseases

b) the management and supervision of livestock premiums as part of the reform of the agricultural policy.

In 2002 the general principles and requirements of food law were laid down in Regulation (EC) No. 178/2002 of the European Parliament and of the Council (16). This Regulation includes the general requirement that 'the traceability of food, feed, food-producing animals, and any other substance, intended to be, or expected to be, incorporated into a food or feed shall be established at all stages of production, processing and distribution'.

Developing a traceability system

The implementation of a national traceability system is a process comprising certain basic steps, in which the public sector must be involved since the process encompasses regulations, standards, international certification, and epidemiological considerations. Private enterprises also may participate, with their own standards and procedures. There will undoubtedly be many similarities and synergies between the two, to their mutual benefit. Some of the points that must be considered when designing a traceability system are outlined below (1, 2, 4, 21, 27).

Objectives

The starting point for any analysis prior to the implementation of a traceability system is a precise description of its objectives, the level of depth sought, and the characteristics to consider. A programme for developing a traceability system should include the various basic elements presented below. However, such a programme would have to be adapted to specific needs and objectives, keeping in mind a series of factors that require discussion by the country's public and private sectors, and by its trading partners (1, 4, 19, 27).

For the system to function, the Veterinary Service must identify its needs with regard to animal health, zoonoses and international certification, and the private sector and trading partners must provide their input as well (1, 2, 23, 24).

The precise objectives of implementing a traceability system will vary from country to country, but for many systems the purposes, requirements and scope could be summarised as follows:

- a system to protect and improve a country's animal health status through surveillance measures that meet World Organisation for Animal Health (OIE) standards

- a system which enables preventive measures to be taken, e.g. when a suspected animal or public health problem is detected the source can be swiftly located and appropriate measures taken to avoid its spread

- a system that is applied to animals and animal products, be they for domestic consumption or for export

- a system that is comparable to systems in other countries and provides transparency and confidence to trading partners (25, 26).

Description of the local situation

Once the objectives have been defined, the following step is a clear and detailed description of the country's current situation. This will help determine the necessary changes, although often some of the elements of a traceability system will already exist in different public or private bodies.

Some of the factors that should enter into a diagnosis of the local situation, and that are common to all countries and traceability systems, are as follows (further details on each of these points are given below):

- farms (location, type, practices)
- animal owners
- animal stocks
- movements
- means of transport
- documentation
- legal framework
- establishments where animals are sold.

Farms: location, type, practices

In order to meet the objectives of a traceability system, including disease surveillance, the location of each farm containing animals must be known, by means of maps and polar or satellite coordinates. In many countries, such information is available, but the public and private sectors must join forces to collate it and adapt it to the system's needs.

Such information must be kept up-to-date by means of a specific procedure; for example, the data provided by the different users may be subject to annual authorisation or updating where necessary. The information thereby obtained should be used to establish a farm registry in the form of a database. The information contained in such registries must be analysed to determine whether it is

sufficient to meet traceability needs, if it is not, the necessary correction should be made (1, 24).

The information should make it possible to evaluate the various criteria needed to meet the defined animal health and epidemiological objectives. Data regarding the location of the farm, its neighbours, its proximity to cities, the type of farm it is (e.g. livestock only, livestock and crops, tourism, etc.), the animal acquisition practices implemented, the people present, the foodstuffs used, and other inputs, can prove valuable when undertaking epidemiological analyses. The dynamic nature of such information must also be taken into account, along with the need for constant updating.

It is important that information be gathered, and a registry compiled, on all farms, and the system of codification must be standardised. This is because it may be necessary, for a certification procedure or the analysis of a health problem, to obtain information on the use of chemicals, pesticides, veterinary drugs, etc., and, moreover, there may be fields devoted to several activities, such as cropping, livestock, horticulture, tourism, etc. (1, 23, 24).

Animal owners

Animal owners must be identified, along with the farms on which their animals are kept, since they shoulder primary responsibility for animal management and for notification of disease events. In the final analysis, the owner is legally responsible for compliance with standards, and up-to-date data is needed for each one.

The owner of an animal, and the owner of the farm on which it lives, are not necessarily one and the same person. For all the reasons set forth above, it is important to know the geographical location of a farm; the identity of the owner is, however, no less important, albeit for legal rather than epidemiological reasons (1, 2, 24).

Animal stocks

Accurate figures are needed with regard to animal stocks per species and the type of production (breeding, fattening, etc.), and procedures for updating these figures must be specified. Such figures are of epidemiological significance, and necessary to plan surveillance and prevention actions. For example, how can a country take preventive measures, or respond rapidly to an emergency situation, if it does not know how many animals it must deal with, nor their characteristics? Species is also an important criterion, and we should not lose sight of the important role in many diseases of wild animal species, although farm owners do not own them, nor are they responsible for them. Information on the species present can be of great epidemiological significance, when related to data on the farm, zone or region, and the destination or use of the animals concerned (1, 2, 4, 23, 24).

Movements

This section concerns the movement of animals beyond farm boundaries, irrespective of destination or, in the case of transhumance, the movement of animals when they change their grazing region.

In many countries, in which the purpose of traceability is to protect animal health, monitoring animal movements is of fundamental importance. It is, however, necessary to clarify certain concepts regarding the management and processing of this information; epidemiologists in countries where existing systems of traceability are being implemented, modified or improved must specify what needs to be known with regard to the movement of animals. Therefore, epidemiologists should determine their needs on the basis of their surveillance programmes and many other factors, such as flow data, which will provide valuable information for the analysis of preventive measures and surveillance systems, and draw attention to changes in flow that result from trade (25, 26).

Furthermore, the time frame for monitoring animal movements, in order to meet the assigned traceability objectives, should be defined, as it has a decisive bearing on many other factors. The decision to perform analyses on a weekly, monthly, quarterly or annual basis will depend on a set of factors that should be analysed when deciding on objectives. When a specific epidemiological situation arises information on animal movements must be provided within a specific time period, which will vary depending on the disease. The closer one gets to the minimum time period for retrieving such information (for example, 24 h in the case of foot and mouth disease), the better one will be able to halt disease spread through the movement of animals and animal products. It is vital, therefore, that the relevant databases can be consulted within an appropriate time frame.

It is important to establish if the available resources are capable of supplying the necessary information quickly enough. To this end, the relevant documents, registries and databases should be analysed, as should the way in which they interact with each other within the existing legal framework. Changes can then be made if it becomes apparent that information requirements are not being met as quickly as they could be.

Moreover, the systems should be capable of using information held by different agencies, both public and private (1, 4, 24).

Means of transport

Means of transport, on the one hand, and the tool of traceability, on the other, have different roles to play in an animal health system. The OIE animal transport standards must be met for sanitary reasons, and transport owners must be responsible for transporting animals in a way that

complies with existing sanitary legislation. To give an example, all animal transport enterprises, even the smallest, know which trips their vehicles have made. Therefore, when an epidemiological analysis of flows is needed, or if an outbreak occurs requiring rapid data on the origin and destination of a consignment of animals, the databases kept by animal transport enterprises can provide, within hours, information on all trips made, for example, in the previous 30, 15 or 5 days within a radius of 10 km from a given farm. Immediate measures can then be taken to prohibit animal movement in these zones, epidemiological analyses can be made, and the farms of destination inspected in order to prevent disease spread.

To that end, on-line information on animal movements is not necessary, but the animal transport enterprises must be registered so that they can be contacted if the need arises. Moreover, the informational needs of Veterinary Services when it comes to flow analysis should be determined, as should the ways in which this information will be processed in the event of an emergency. National Veterinary Services will need to adapt their needs for information according to their objectives, and extract useful information from the databases of transporters.

Documentation

This is another basic issue in the implementation of traceability systems, disease prevention plans and other animal health measures. The first step is to review all existing documentation, such as notifications or reports of suspected cases, farm inspection reports, documents on the movement of animals and animal products, etc. The location of such documentation and its degree of accessibility must be noted, and, if necessary, modifications should be made to bring it in line with the requirements and objectives of the traceability system adopted (1, 2, 4, 23, 24, 27).

Legal framework

A basic aspect in implementing a traceability system, or in taking any national action, is a review of the existing relevant legislation and, on that basis, the unambiguous choice of the competent authority. Subsequently, the details of the programme can be worked out with regard to the responsibilities of each party, compulsory documentation, movement of animals and animal products and the system of registry. In other words, all programme actions must be clearly developed in relation to their legal framework if they are to be properly implemented in the field.

Other aspects to consider when establishing the legal framework are:

- the definition, roles and scope of the competent authority

- the definition of system components and the role and obligations of each one
- the documentation/notification of animal health-related events, the transport of animals and animal products and the registration system
- the animal identification system, livestock farms, processing plants, and animal and animal product transport vehicles (1, 2, 4, 23, 24, 25, 26).

Establishments where animals are sold

Available information must be collected in order to determine the location of all establishments where animals are sold, as is the case with transport enterprises. This central register of all establishments may also contain information on animal movements into and out of the establishments, but in any event, this information must be held by the establishments themselves to be used for epidemiological analyses in order to plan preventive action; when a disease event occurs, additional information may be requested in order to trace the origin of the problem and avoid its spread. Each time new information is collected, the corresponding registries and databases should be updated accordingly.

Identification

Ever since traceability has been a topical issue, the concept has been confused with that of identification in many countries and sectors. Indeed, identification is indispensable for traceability to work, but in addition to the identification of animals the establishments where they are kept or processed should be identified as well, and all these data should be cross-checked. Therefore, in each country it is necessary first of all to set the objectives of a traceability system, which is a tool to pursue various actions, such as prevention, control and eradication of diseases or health certification. It must be kept clearly in mind that identification and traceability are not ends in themselves, but rather means or tools to achieve a given objective.

Once objectives have been assigned to the various components involved in a system of traceability and identification in a given country a decision can be taken as to which identification system to use, and how to move from the current to the desired system.

It must be decided which identification system to implement for:

- animals
- farms where animals are kept
- processing plants

- animal transport vehicles
- products.

Furthermore, the registry format must allow for the necessary correlations, for example, products with processing plant, or animals with farms of origin or with any other farm through which they pass during transit.

There is much written documentation on available elements of identification. Whichever choices are made, they must correspond to the set objectives and needs (1, 2, 4, 22, 24).

Analysis of information

The key point and greatest challenge is to understand that traceability is about keeping up-to-date records of disease and other health-related events, and maintaining accessible data on laboratory results, movement of animals and their products. These data will enable Veterinary Services to pursue their specific objectives of prevention, control and eradication of animal diseases and international certification (25, 26).

What is essential is to have access to information and to registries, but the system chosen to enable these analyses will differ from country to country. Some may establish centralised databases containing all necessary information, whereas others may establish regional or local databases. No single recipe can be provided, but it is indispensable for health and certification programme officials to have access to necessary information (1, 2, 19, 21).

Implementation in the field

Once needs have been defined and the situation has been diagnosed, we can go on to the next step: implementation in the field, for which the following items, *inter alia*, must be considered (1, 24):

- planning
- training
- legislation
- financing
- administration
- timetable for implementation.

European Union legislation

The European Union (EU) has laid down requirements for the identification and registration of bovine animals, pigs,

sheep and goats taking into account the specific needs of the various species and the different production systems involved.

Bovine animals

Council Directive 92/102/EEC stated that bovine animals should be identified with an eartag bearing a code which made it possible to identify each animal individually, as well as the holding on which it was born. However, experience, and notably the bovine spongiform encephalopathy crisis, showed that the implementation of Directive 92/102/EEC was not entirely satisfactory and needed further improvement. Therefore, it became clear that it would be necessary to adopt a specific regulation for bovine animals in order to reinforce the provisions of the Directive. Hence, in 1997, Council Regulation (EC) No. 820/97 establishing a system for the identification and registration of bovine animals and regarding the labelling of beef and beef products (13) was adopted. According to this Regulation bovine animals must be identified by an eartag applied to each ear and accompanied by a passport whenever they are moved. These requirements are upheld in the current Regulation (EC) No. 1760/2000 of the European Parliament and of the Council of 17 July 2000 establishing a system for the identification and registration of bovine animals and regarding the labelling of beef and beef products and repealing Council Regulation (EC) No. 820/97 (14).

The EU system for the identification and registration of bovine animals comprises several different elements, all of which are outlined below.

Eartags

According to the detailed rules laid down in Commission Regulation (EC) No. 911/2004 (6), an eartag must be worn in each ear and both tags must contain at least the name and the code or logo of the competent authority or the central competent authority of the Member State which allocated them, the two-letter country code and a numeric code not exceeding 12 digits. An additional bar code may be authorised by the central competent authorities of the Member States. Furthermore the replacement eartags used in the event of eartag losses may contain a mark which indicates that the eartag is a replacement and which includes a Roman numeral indicating how many times the tag has been replaced.

Cattle passports

Commission Regulation (EC) No. 911/2004 also states that a passport, which will accompany the individual animal whenever it is moved, must be issued for each bovine animal within 14 days of the notification of its birth, or, in the case of animals imported from third countries, within

14 days of the notification of its re-identification by the Member State concerned. Passports may be issued for animals from another Member State under the same conditions. In such cases, the passport accompanying the animal on its arrival must be surrendered to the competent authority, which then returns it to the issuing Member State. Whenever a bovine animal is moved, it must be accompanied by its passport. The exception to this requirement is that animals can move within a Member State without being accompanied by a passport provided the Member State has a computerised database which the Commission deems fully operational. In the case of the death of an animal, the passport must be returned by the keeper to the competent authority. When animals are sent to the slaughterhouse, the operator of the slaughterhouse must return the passport to the competent authority. When animals are exported to third countries, the passport must be surrendered by the last keeper to the competent authority at the place where the animal is exported. Commission Regulation (EC) No. 911/2004 specifies that the passport must contain information on the animal (identification code, date of birth, sex, breed or colour of coat), the identification code of the mother or, in the case of an animal imported from a third country, the identification number given by the country of origin and the new identification number issued when the animal entered the EU, an identification number of the holding where the animal was born, and identification numbers of all holdings where the animal has been kept and the dates of each change of holding. In addition the passport must contain the signature of the keeper(s), with the exception of the transporter, and the name of the issuing authority.

Individual registers on each holding

According to Commission Regulation (EC) No. 911/2004 registers kept on each holding must contain up-to-date information on each animal (identification code, date of birth, sex, breed or colour of coat), the date of death of the animal on the holding, or, in the case of departure, the identification code of the holding of destination and the date for departure, and, in the case of arrival, the identification code of the holding of dispatch and the date of arrival. In addition, checks carried out by the competent authority must be recorded in the register.

Computerised national databases

In accordance with the requirements laid down in Council Directive 64/432/EEC computerised national databases for bovine animals have been fully operational since 31 December 1999. These national databases must contain information for each bovine animal (identification code, date of birth, sex, breed or colour of coat), identification code of the mother or, in the case of an animal imported from a third country, the identification number given in the country of origin and the new identification number given when the animal entered the EU, the identification number

of the holding where the animal was born, and identification numbers of all holdings where the animal has been kept, the dates of each change of holding and date of death or slaughter. In addition, the database must contain information for each holding (identification number and name and address of the holder). The database must be able to supply at any time a list of identification numbers for all bovine animals present on a holding, and a list of all changes of holding for each bovine animal, starting from the holding of birth or holding of importation.

During 2002 the Commission's Food and Veterinary Office carried out a series of inspection missions in all Member States in order to evaluate the operation of traceability systems and labelling of beef and minced beef. In general the inspection teams found that the requirements for the registration of holdings and the identification of bovine animals were understood in all Member States, and official control systems were in place to monitor their performance. Whilst operational shortfalls were frequently seen, they did not cast doubt on the validity of the basic structure in place.

Electronic identification

The current system already allows countries to use an optional electronic identifier in addition to the two compulsory eartags; however, in accordance with Regulation (EC) No. 1760/2000 of the European Parliament and of the Council, the Commission has submitted a report on the possibility of introducing more extensive use of electronic identification for bovine animals (7). This report is based on the outcome of a large-scale research project on livestock electronic identification (IDEA) launched by the Commission in 1998 and finalised in 2002. This project, which was lead by the Joint Research Centre of the Commission, has demonstrated that in principle, the use of electronic identifiers can deliver a substantial improvement in animal identification systems provided a number of conditions concerning the accompanying measures are fulfilled. The conclusions of this project allow recommendations to be made on technical issues and conclusions to be drawn concerning the conditions of introducing electronic identification arrangements for bovine animals in the EU.

Based on this study electronic identification could be introduced for bovine animals either as a compulsory system in all Member States or as an optional system, where Member States could authorise the replacement of the second eartag with an electronic identifier. The third option would be to maintain the status quo, i.e. the use of an optional electronic identifier in addition to the two eartags.

In view of the direction already taken with regard to the reinforced system for the identification and registration of

sheep and goats as laid down in Regulation (EC) No. 21/2004 (18) (see the section on sheep and goats below) the preferred option is the introduction of an optional system that would, over time, become a compulsory system. A decision on the compulsory system should take into account the practical experience gained by those Member States which choose to introduce the system on an optional basis.

Pigs

According to Council Directive 92/102/EEC pigs must be marked as soon as possible, and certainly before they leave the holding, with an eartag or tattoo. The identification mark must make it possible to determine the holding from which they came and enable reference to be made to any accompanying document which must mention the eartag or tattoo. Furthermore, the mark must enable reference to be made to the list of all holdings with animals of the relevant species which must be kept in each Member State.

The identification mark can only be removed or replaced with the permission of the competent authority, and the keeper must record any new mark in the register establishing a link with the previous mark applied to the animal.

The national systems for movements of pigs in their territories must enable the holding from which the animals came and the holding on which the animals were born to be identified.

Pig keepers must keep a register stating the number of animals present on the holding. The register must include an up-to-date record of movements (number of animals involved in each entering and leaving operation) stating as appropriate their origin or destination and the date of such movements and the identification mark.

For animals to be moved to or from a market or collection centre the keeper must provide a document, setting out details of the animals, to the operator at the market or collection centre who is a keeper of the animals on a temporary basis.

Animals imported from a third country must be identified by a mark within 30 days, or before they leave the holding of destination, whichever is sooner. This requirement does not apply if the holding of destination is a slaughterhouse situated on the territory of the Member State in which the veterinary border checks are carried out and the animals are actually slaughtered within the 30-day period. For the purposes of traceability both the identification provided by the third country and the identification allocated by the Member State of destination must be recorded in the holding register.

For movements to other Member States pigs must be accompanied by a health certificate in accordance with Community rules on health problems affecting intra-Community trade in bovine animals and swine (Council Directive 64/432/EEC). The health certificate includes information on the official individual identification of the animals concerned.

In accordance with Council Directive 64/432/EEC computerised national databases which contain information on pig holdings and of the movements of pigs from all holdings have been compulsory since 31 December 2002. Information on each movement of groups of pigs must include the number of pigs being moved, the identification number of the holding or herd of departure as well as the date of departure, and the identification number of the holding or herd of arrival, as well as the date of arrival. To ensure the appropriate implementation of functional databases for recording the movements of porcine animals Community rules for computerised national databases and rules for the registration of holdings were laid down in 2000 by amendment of Council Directive 64/432/EEC and Commission Decision 2000/678/EC (5), respectively.

Sheep and goats

Experience, and particularly the foot and mouth disease crisis in 2001, had shown that the implementation of the provisions for the identification and registration of sheep and goats laid down in Council Directive 92/102/EEC, which were much the same as they were for pigs, had not been satisfactory. However, Council Regulation (EC) No. 21/2004 addressed this acknowledged need for more stringent provisions by establishing a system for the identification and registration of ovine and caprine animals (18) that reinforced the provisions of Council Directive 92/102/EEC. This new system comprises various different elements, most of which are outlined below.

Means of identification

There must be a means of identification, approved by the competent authority, which will enable individual animals to be identified. As a general rule this means two eartags to ensure that identification remains possible even if one eartag is lost. Member States may authorise the use of an electronic identifier instead of the second eartag. Technical characteristics are laid down to ensure the compatibility of readers and identifiers so that the electronic identifiers can be read throughout the EU. For animals not involved in intra-Community trade the competent authority may authorise the use of a tattoo or a national system approved by the Commission instead of the second eartag.

Individual registers on each holding

Keepers must keep a register on the holding with up-to-date information on movements of animals to and from the

holding, including information on the holding of departure and the holding of destination. From the date when electronic identification becomes compulsory information on the individual identification codes will be included in these registers.

Movement documents

Movement documents must accompany each group of animals throughout the movement. This document must contain the following: information on the holding of departure, the number of animals moved, the holding of destination or the next keeper, and data concerning the transport as well as the date of departure and the signature of the keeper. From the date when electronic identification becomes compulsory information on the individual identification codes will be included in the documentation.

Computerised national databases

Member States must establish a computerised database with information on all holdings. From the date when electronic identification becomes compulsory all movements of groups of animals will be recorded in the database.

Other provisions

The reinforced system as outlined in Council Regulation (EC) No. 21/2004 entered into force on 9 July 2005 and since then all animals born on a holding have been identified according to the new provisions. Options are given to Member States to apply the measures slightly differently in certain circumstances, e.g. the current system requires that animals be identified by the time they are six months of age, but this period may be extended to nine months if animals are kept in free-range or extensive farming conditions. All animals must, however, be identified before they leave the holding. In addition, for animals intended for slaughter before 12 months of age, the competent authority of the Member States may authorise a system by which animals are identified by means of one eartag bearing the code of the holding of birth instead of the individual identification code. Whenever a batch of these animals is moved the only information recorded in the holding register and the movement document is the code of the holding of birth and the total number of animals being transported. When electronic identification becomes compulsory some animals will be provided with individual identification codes which will be recorded in the holding register and movement document, other animals will continue to be identified by the holding of origin as mentioned above.

With regard to electronic identification, the IDEA Project included sheep and goats as well as bovine animals. The main conclusion of the IDEA Project was that the technology involved in the electronic identification of

sheep and goats has been developed to such an extent that it can be applied. However, the implementing measures required for the proper introduction of the system of electronic identification on a Community-scale have not yet been developed, although the final report of the IDEA project provides some recommendations. Council Regulation (EC) No. 21/2004 foresees that further guidelines and procedures for the implementation shall be adopted through the Standing Committee on the Food Chain and Animal Health so that the general electronic identification of sheep and goats can be implemented by 1 January 2008. This date shall be confirmed or amended in view of the practical experience gained by those countries implementing an optional system.

be clearly defined in order to make an assessment of the situation and, on that basis, design an appropriate traceability system. When defining the objectives, needs and means of implementation, the different sectors involved, both public and private, and the trading partners must cooperate very closely.

To implement traceability, it is important to bear in mind that it is a tool to assist in the prevention, control and eradication of animal diseases, including zoonoses, and in certification. To the extent that it is understood that traceability is a tool, that identification is one of the aspects of traceability, and that it goes hand-in-hand with the analysis of recorded information, the various components involved can be successfully implemented.

Conclusions

When defining the purpose of a traceability system national objectives regarding the prevention, control and eradication of animal diseases, including zoonoses, must



La mise en place des systèmes de traçabilité

S. Ammendrup & L.O. Barcos

Résumé

La traçabilité est un instrument dont les pays peuvent se servir pour remplir leurs objectifs de prophylaxie, de prévention et d'éradication des maladies animales. Les auteurs décrivent les étapes successives de la mise en place réussie d'un système de traçabilité.

Avant de concevoir un système de traçabilité, il convient de définir les caractéristiques que l'on cherche à surveiller tout au long de la chaîne de production d'aliments. Il est fondamental que les différents secteurs concernés participent à la définition des objectifs du système de traçabilité et des besoins qui en résultent. De même, il est indispensable de disposer d'un cadre juridique clair.

L'identification et l'enregistrement des animaux sont obligatoires dans l'Union européenne pour les espèces bovine, porcine, ovine et caprine. Lors des échanges intracommunautaires, ces animaux doivent être accompagnés d'un certificat indiquant leur identité et leur statut sanitaire. Les critères d'identification ont été harmonisés au sein de l'Union européenne afin de garantir la traçabilité pour motifs sanitaires. En outre, la législation européenne impose la traçabilité des denrées alimentaires, des aliments pour animaux et des animaux destinés à l'alimentation, et ce à tous les stades de la production.

Mots-clés

Bovin – Caprin – Identification animale – Ovin – Passeport – Porcin – Traçabilité – Union européenne.



Aplicación de los sistemas de trazabilidad

S. Ammendrup & L.O. Barcos

Resumen

Los países recurren a los sistemas de trazabilidad para alcanzar sus objetivos de control, prevención y erradicación de enfermedades animales. En este artículo se exponen los componentes obligatorios de los sistemas de trazabilidad.

Antes de desarrollar un sistema de trazabilidad deben determinarse las distintas características que se rastrearán en las diferentes etapas de la cadena de producción de alimentos. Es de fundamental importancia que los distintos sectores trabajen en colaboración a la hora de definir los objetivos y las necesidades consiguientes de un sistema de trazabilidad. También es indispensable que se disponga de un marco legal claro.

La normativa de la Unión Europea (UE) exige la identificación y el registro del ganado bovino, porcino, ovino y caprino. Para que puedan comercializarse dentro de la UE, los animales deben ir acompañados por un certificado sanitario con información sobre su identidad y estado sanitario. La identificación obligatoria se armonizó en todos los países de la UE para garantizar la trazabilidad con fines veterinarios. Además, la reglamentación de la UE impone que se establezca la trazabilidad de los alimentos, piensos y animales para producción de alimentos en todas las etapas de la cadena alimentaria.

Palabras clave

Bovino – Caprino – Identificación de los animales – Ovino – Pasaporte – Porcino – Trazabilidad – Unión Europea.



References

1. Barcos L.O. (2001). – Recent developments in animal identification and the traceability of animal products in international trade. *In* Traceability of animals and animal products (H.A. MacDaniel & M.K. Sheridan, eds). *Rev. sci. tech. Off. int. Epiz.*, **20** (2), 640-651.
2. Barcos L.O. (2004). – Identificación animal y trazabilidad [Animal identification and traceability]. Technical Item II. *In* Proc. 72nd OIE General Session, 23-28 May, Paris. Document 72 SG/10. World Organisation for Animal Health, Paris.
3. Canadian Food Inspection Agency (CFIA) (1999). – Enforcement of the National Cattle Identification Program (R. Robinson & J.A. Kellar, eds.). CFIA, Ottawa, 1-24.
4. Canadian Food Inspection Agency (CFIA) (1999). – Regulation amending the health of animals regulations. Section 172. Animal Identification. CFIA, Ottawa.
5. Commission of the European Communities (2000). – Commission Decision 2000/678/EC of 7 November 2000 laying down detailed rules for registration of holdings in national databases for porcine animals as foreseen by Council Directive 64/432/EEC. *Off. J. Eur. Union*, **L 281**, 16-17.
6. Commission of the European Communities (2004). – Commission Regulation (EC) No. 911/2004 of 29 April 2004 implementing Regulation (EC) No. 1760/2000 of the European Parliament and of the Council as regards eartags, passports and holding registers. *Off. J. Eur. Union*, **L 163**, 65-70.
7. Commission of the European Communities (2005). – Report from the Commission to the Council and the European Parliament on the possibility of introduction of electronic identification for bovine animals. COM(2005) 9 final. European Commission, Brussels.

8. Council of the European Communities (1964). – Council Directive 64/432/EEC of 26 June 1964 on animal health problems affecting intra-Community trade in bovine animals and swine. *Off. J. Eur. Union*, **121**, 1977-2012.
9. Council of the European Communities (1980). – Council Directive 80/217/EEC of 22 January 1980 introducing Community measures for the control of classical swine fever. *Off. J. Eur. Union*, **L 47**, 11-23.
10. Council of the European Communities (1985). – Council Directive 85/511/EEC of 18 November 1985 introducing Community measures for the control of foot-and-mouth disease. *Off. J. Eur. Union*, **L 315**, 11-18.
11. Council of the European Communities (1990). – Council Directive 90/425/EEC of 26 June 1990 concerning veterinary and zootechnical checks applicable in intra-Community trade in certain live animals and products with a view to the completion of the internal market. *Off. J. Eur. Union*, **L 224**, 29-41.
12. Council of the European Communities (1992). – Council Directive 92/102/EEC of 27 November 1992 on the identification and registration of animals. *Off. J. Eur. Union*, **L 355**, 32-36.
13. Council of the European Communities (1997). – Council Regulation (EC) No. 820/97 of 21 April 1997 establishing a system for the identification and registration of bovine animals and regarding the labelling of beef and beef products. *Off. J. Eur. Union*, **L 117**, 1-8.
14. Council of the European Communities (2000). – Regulation (EC) No. 1760/2000 of the European Parliament and of the Council of 17 July 2000 establishing a system for the identification and registration of bovine animals and regarding the labelling of beef and beef products and repealing Council Regulation (EC) No. 820/97. *Off. J. Eur. Union*, **L 204**, 1-10.
15. Council of the European Communities (2001). – Council Directive 2001/89/EC of 23 October 2001 on Community measures for the control of classical swine fever. *Off. J. Eur. Union*, **L 316**, 5-35.
16. Council of the European Communities (2002). – Regulation (EC) No. 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety. *Off. J. Eur. Union*, **L 31**, 1-24.
17. Council of the European Communities (2003). – Council Directive 2003/85/EC of 29 September 2003 on Community measures for the control of foot-and-mouth disease repealing Directive 85/511/EEC and Decisions 89/531/EEC and 91/665/EEC and amending Directive 92/46/EEC. *Off. J. Eur. Union*, **L 306**, 1-87.
18. Council of the European Communities (2004). – Council Regulation (EC) No. 21/2004 of 17 December 2003 establishing a system for the identification and registration of ovine and caprine animals and amending Regulation (EC) No. 1782/2003 and Directives 92/102/EEC and 64/432/EEC regarding the labelling of beef and beef products. *Off. J. Eur. Union*, **L 5**, 8-17.
19. Disney W.T., Green J.W., Forsythe K.W., Wiemers J.F. & Weber S. (2001). – Benefit-cost analysis of animal identification for disease prevention and control. In Traceability of animals and animal products (H.A. MacDaniel & M.K. Sheridan, eds). *Rev. sci. tech. Off. int. Epiz.*, **20** (2), 385-405.
20. Hunter S. (1996). – Tracing single animals for quality control purposes. Allflex Europe SA, France.
21. Instituto Argentino de Normalización (IRAM) (1994). – Normas IRAM-IACC-ISO sobre gestión y aseguramiento de la calidad. Cuarta edición ampliada en 1998. IRAM, Buenos Aires.
22. Landais E. (2001). – Le marquage du bétail dans les systèmes pastoraux traditionnels. In Traceability of animals and animal products (H.A. MacDaniel & M.K. Sheridan, eds). *Rev. sci. tech. Off. int. Epiz.*, **20** (2), 445-462.
23. Neophytou G. (1999). – Systems of animal identification and their importance for disease surveillance. In Comprehensive reports on Technical Items presented to the International Committee or to Regional Commissions. OIE, Paris.
24. Van Vugt F., Ferri G., Scudamore J., Vallat B., Chaisemartin D., Bonbon E., Zwingmann E., Caja G., Almanza de Lara V., Kellar J., Marshall B., Clifford J., Hammerschmidt N., McCutcheon S. & Barcos L. (1998). – Seminario Internacional de la OIE sobre identificación permanente de animales y trazabilidad. Del Campo al Plato, 25-26 November, Buenos Aires. Secretaría de Agricultura, Ganadería, Pesca y Alimentos (SAGPyA)/ Servicio Nacional de Sanidad y Calidad Agroalimentaria (SENASA), Buenos Aires.
25. Wilson D.W. & Beers P.T. (2001). – Global trade requirements and compliance with World Trade Organization agreements: the role of tracing animals and animal products. In Traceability of animals and animal products (H.A. MacDaniel & M.K. Sheridan, eds). *Rev. sci. tech. Off. int. Epiz.*, **20** (2), 379-384.
26. World Organisation for Animal Health (OIE) (2003). – Terrestrial Animal Health Code, 12th Ed. OIE, Paris.
27. World Organisation for Animal Health (OIE) (2003). – Veterinary Services: organisation, quality assurance, evaluation. *Rev. sci. tech. Off. int. Epiz.*, **22** (2).