
Brazilian and Mercosur experiences in development and implementation of animal identification and recording systems

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Customer demands for food safety and origin certification are causing major challenges to the livestock industry. Mercosur countries are quickly developing and adopting animal identification and recording systems to comply with the required product traceability. In this matter, Brazil has been pioneer in implementing the Brazilian Bovine and Bubaline Identification and Certification System (SISBOV) in 2002. This system aims individual certification of origin, identification, registration and monitoring. Each animal has a unique individual identification system and receives an animal identification document (DIA), which is equivalent to a passport, and must accompany the animal in every movement. Currently, to be considered traced and exported, animals have to stay in the system for 40 days before the DIA may be issued. As of April 2004, there were about 15 million animals registered in SISBOV. Similar systems are being adopted in Argentina and Uruguay, whereas sanitary problems regarding the Food and Mouth disease have hindered the implementation of traceability programs in Paraguay. Mercosur countries, particularly Argentina, Brazil and Uruguay, are in a key position to supply beef products complying with the most exigent consumer's requirements and, in this regard, are adopting highly reliable and auditable traceability systems of their cattle populations.

Summary

Keywords: beef cattle, identification, mercosur, origin certification, recording, traceability.

Introduction

Since the beginning of the last century, animal identification and recording (I&R) systems have been implemented in Argentina, Brazil, Paraguay and Uruguay, which are the countries composing the Mercosur common trade market. These I&R systems were focused on pedigree information from purebred animals and maintained by breed associations (herd books). During the 1970's performance recording geared towards the establishment of data based genetic improvement programs was implemented.

Recently, a whole new paradigm has surged in animal I&R systems. New customer demands for food safety and origin certification are causing major challenges to the livestock industry. This has being particularly relevant for beef commodities, since several factors triggered by the Bovine Spongiform Encephalopathy (BSE) outbreaks in Europe, Canada, United States and Japan have severely damaged consumer trust in cattle products. Beef commodities consist in one of the most important exports for Mercosur countries, particularly Argentina, Brazil and Uruguay, which compose a long-established beef production region (see Table 1). In 2001, the Mercosur countries accounted for 16% of the world beef production and 17% of the beef exports (FAOSTAT data, 2004). Therefore, this paper focuses I&R systems for cattle, even so, most concepts also apply to other livestock species, e.g. sheep and goats.

The European Union (EU) is a key market for Mercosur beef. Thereby, the associated countries are quickly developing and adopting animal I&R systems to comply with product traceability (defined as the ability to follow all information concerning the animal health, sanitary, management and alimentary conditions, as well as location, movements and processes occurred from birth to consumer table), which is demanded by EU customers.

The objective of this paper is to describe the main actions taking place in Mercosur countries to assure traceability of beef products. Brazil has been pioneer among Mercosur members in developing traceability systems and a more comprehensive description of the Brazilian system is given below, followed by some key action been taken in the other countries composing the Mercosur free trade market.

Mercosur strategies and animal I&R systems towards product traceability

The external market is the chief price maker for beef products in Mercosur countries, i.e., in times when exports were low prices were also low and vice-versa. In order to maintain the current markets and to attain new markets in the future, it is imperative to offer safe and origin certified products. In the EU, Regulation (EC) No 1760/2000 of the European Parliament and Council established a system for the identification and registration of bovine animals and regarding the labelling of beef and beef products. According to these regulations, animals should be individually identified by an ear tag applied in each ear and accompanied by a passport throughout all movements, in order to permit bovine animals to be traced. Moreover, all EU members must have a National database

Table 1. Population, bovine herd stock, production, exports and consumption of beef products for Mercosur countries in 2001.

Country	Population (1 000)	Cattle stock (1 000)	Beef production (1 000 MT ¹)	Beef exports, (1,000 MT ¹) (% production)	Beef consumption, (kg/yr/person)
Argentina	37 529	48 851	2 452	191 (8%)	56.5
Brazil	174 029	176 389	6 671	798 (12%)	34.3
Paraguay	5 604	9 889	250	59 (24%)	33.9
Uruguay	3 366	10 595	317	186 (59%)	54.5

Source: FAOSTAT data, 2004

1 MT= Metric Tons

to register individually each animal ID and main characteristics (e.g., birth date, gender, breed, and country of origin). All producers and farms must also be registered in this database.

These requirements also apply to EU beef suppliers, including the Mercosur countries, which are in the process of developing their national systems, with distinct levels of accomplishment, as described below.

In February 2002, the SISBOV (Sistema Brasileiro de Identificação e Certificação de Origem Bovina e Bubalina; Ries & Antunes, 2003) was created by Ministry of Agriculture, Livestock and Food Supply – MAPA’s Agricultural Defense Secretariat. SISBOV’s objective is to accomplish the individual certification of origin, identification, registration and monitoring of all bovine and bubaline animals, both national and imported. Since July 2002, all slaughtered animals to be exported to the EU must be registered in SISBOV.

This system functions in partnership with the private sector. MAPA accredits public and private national organizations, which actually do the certification process alongside the beef producers. New rules have been recently established, through normative resolution N°21 of April 2, 2004 (Ministério da Agricultura, Pecuária e Abastecimento, 2004), to facilitate the functionality of the system, to standardize the identification stamps, and to improve disease control. The process to register a producer, farm and animals in SISBOV is as follows:

- 1) Registration of the producer and its farm(s) in the SISBOV through a certifying organization;
- 2) Producer indicates how many animals will be registered in the program and the dual identification method to be used (see Table 2 for options);
- 3) Producer identifies the animals using the identification devices provided by SISBOV through a certifying organization;

The Brazilian Bovine and Bubaline Identification and Certification System - SISBOV

- 4) An auditor accredited by the certifying organization must visit the farm, audit the animals and fill a report to be forwarded to certifying organization;
- 5) Animals are registered in the SISBOV National database by certifying organization;
- 6) Any movements, sanitary and nutritional management must be registered in the system by the producer, using an interface software developed and supplied by the certifying organizations conforming with MAPA's regulations;
- 7) The traceability cycle for an animal closes with its slaughtering in a certified plant or by its death.

The SISBOV identification system

Each animal has an individual identification, unique in the whole Country, issued and controlled by the SISBOV's coordination and composed of 15 digits: the first three digits characterize the Country of birth; the two subsequent digits represent the State of origin; the nine subsequent digits identify the bovine or bubaline (of these nine digits, the last six are considered the management or working number of the animal), and the last number is a verification digit. Each animal must have dual identification, following one of the options described in Table 2.

Colour coding is also used in this system: the standard colour for ear tags is yellow; whereas white indicates an imported animal and orange is used in case a lost original ear tag has to be replaced.

Table 2. Dual identification options permitted by the Brazilian Bovine and Bubaline Identification and Certification System – SISBOV^a.

Option	Primary ID	Secondary ID
I	SISBOV ear tag ¹ in the right ear	Button ear tag ¹ in the left ear with the management number ²
II	SISBOV ear tag in the right ear	Electronic device
III	SISBOV ear tag in the right ear	Tattoo in the left ear of the management number
IV	SISBOV ear tag in the right ear	Iron brand in the right hind limb lower portion (in two rows of three numbers) of the management number

^aAnimals registered in breed associations may additionally have their registration number in a tattoo or ear tag, as long as their SISBOV complete and management numbers are printed in the registration document.

¹See Figure 1.

²SISBOV's 9th to 14th digits.



Figure 1. Regular and button ear tags used by the Brazilian – SISBOV.

Each individual registered in SISBOV has an animal identification document (DIA). This document is the official SISBOV identification, being equivalent to a passport, and must accompany the animal in every movement. Information contained in the DIA includes: the number of the animal in the SISBOV and in the certifying organization; country of origin; breed; gender; farm of birth; city and state of birth, city and state of identification, identification date, birth date, identification of the certifying organization and MAPA's logo. The DIA is issued by the certifying organizations based on information contained in the National database. After animals death (natural or slaughter) the document is confiscated and the animal removed from the database.

To be considered traced and allowed to be exported to EU, the minimal time that an animal has to stay in the system before the DIA may be issued was established by MAPA in Normative Resolution 88/2003, according with the calendar presented below.

Animals to be exported to the EU and other markets, will be released to be slaughtered after accomplished the following requirements:

- a) From May 31, 2004, remaining a minimal of 90 days in the SISBOV's National database.
- b) From November 30, 2004, remaining a minimal of 180 days in the SISBOV's National database.
- c) From May 31, 2005, remaining a minimal of 365 days in the SISBOV's National database.

All animals originated from farms located in Food and Mouth disease free States (Bahía, Espírito Santo, Goiás, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná, Rio de Janeiro, Rio Grande do Sul, Santa Catarina, São Paulo, Sergipe, Tocantins, federal district, and Rondônia) must be included in the SISBOV National data base by 31 December 2005, within 90 days after birth. All animals from all States must be included in the system by 31 December 2007.

*The Animal
Identification
Document*

SISBOV's Calendar

As of April 2004, there were 27 accredited certifying organizations and about 15 million animals registered in SISBOV.

Other Mercosur countries

Individual identification and certification systems, similar to SISBOV, are being implemented in the other Mercosur countries with some peculiarities, as described in what follows.

Argentina

In Argentina, Resolution 15/2003 of the Argentinian National Health and Agroalimentary Quality Service - SENASA (Servicio Nacional de Sanidad y Calidad Agroalimentaria, 2004) has established the Identification System of Cattle for Exportation (Sistema de Identificación de Ganado Bovino para Exportación; Ministerio de la Producción, 2003), with which all farms registered in the Rural Establishments Suppliers of Cattle Slaughtered for Exportation Database must comply, satisfying requirements of external markets, especially the EU.

The identification system is based on ear tags placed in the left ear, following a sequential and unique number, which are provided to the producers by private companies previously registered and accredited by SENASA. Producer registration number is also printed on the back side of the ear tag.

Since 15 August 2003 all animals destined to external markets must be identified and remain in the system for at least 40 days prior to slaughter and all farms supplying animals for exportation must grow animals derived from their own herds or from herds registered in Establishment of Origin database. For each animal an individual identification card is issued and accompanies the animal in all movements, particularly when in transit to the slaughter plants. Moreover, all animals born in these registered farms since Resolution 15/2003 has been published must be identified before weaning and all herd stock must be identified and registered in the system by 30 June 2004. Furthermore, each farm must keep a movements and stock registration book, in which birth, death, purchases and sales of animals, as well as the usage of ear tags, are recorded. Veterinarians accredited by SENASA are responsible to audit the farms, animals and books.

Uruguay

At present, Uruguay is in the transition process from the current group traceability systems to an individual identification and traceability system. The newly created National Cattle Information System - SNIG (Sistema Nacional de Información Ganadera, 2004a,b) has the objective of assure cattle traceability from farm of origin to packing plant, both individually and in groups. This is based in two parallel strategies: the consolidation and optimisation of the current group traceability system and the gradual introduction of an individual traceability system. The system integrates information on animals stock, movements and changes of ownership, as well as productive and sanitary processes.

Producers are currently being invited to voluntarily join a pilot plan, which is the first implementation step of the National individual traceability program (Ministerio de Ganadería, Agricultura y Pesca, 2004). This pilot plan intent to individually identify one million head of young cattle (male less than one year old and females less than two years old), preferably from those producers engaged in branded beef programs, for example Uruguayan natural beef, Organic beef, Hereford beef, etc. A dual identification systems consisting of a ear tag and an electronic device (either a button shaped ear tag or a ruminal bolus transponder) is being adopted. The number consists of 12 digits, the first three identifying the country and the nine remainder being the animal identification, from which the last four digits correspond to the animal's working number. This identification will be unique and permanent, being unchangeable and not recyclable. The information record in the moment an individual is registered in the system includes: the identification number, the producer code, season and year of birth, animal category, gender and breed. In order to precisely record animal movements, transporters will be equipped with electronic device readers attached to notebooks wireless connected to SNIG.

The SNIG will also be integrated with the Uruguayan Geographic Information System to facilitated the prompt location of animals and farms in the case of disease outbreaks, especially Food and Mouth disease (Sistema Nacional de Información Gandadera, 2004a).

Sanitary problems regarding the Food and Mouth disease status, have closed the most important international markets, including the EU, for Paraguayan beef. This has hindered the implementation of traceability programs in Paraguay and, even though, there is crescent awareness of the Paraguay beef industry for the need of having product traceability, if the important markets are to be recouped (Revista El Productor, 2003). Paraguay is least achieved Mercosur country in this matter.

Paraguay

Consumer demand for product safety has cause fundamental changes in beef cattle industry worldwide. This, in addition to raising consumer concerns with animal welfare and environmental conservation has boosted the requirement of origin certification and traceability of beef products and processes from the birth of the animal to the consumer table. This implies the development and implementation of unique, permanent, reliable and audible cattle identification systems.

Mercosur countries, particularly Argentina, Brazil and Uruguay, are in a key position to supply beef products complying with the most exigent consumer's requirements. These countries production systems are, in general, extensive, pasture based and environmentally sound, and they also have good sanitary conditions, particularly regarding BSE and Foot and Mouth disease. Moreover, Brazilian and Uruguayan cattle is completely hormone free, whereas Argentina's herds that sell cattle to

**Conclusions
and
perspectives**

external markets are registered by SENASA and must also be hormone free. In order to recoup lost consumers, maintain the current and attain new markets, these countries have adopted or are in the process of implementing highly reliable and auditable traceability systems of their cattle populations.

Finally, it is important to note that before benefits from these systems can be harvested, there are costs to bare. The development and maintenance of the national databases are being covered by the government, however the cost of animal identification and audition of the systems are being shared with the producers. In Brazil and Argentina the identification cost (of about one Euro per animal if an electronic identification device is not used) are being entirely paid by the producers. Nonetheless, there are cases where the slaughter houses loan the money or even pay such costs, if the producer commit to sell them the traced cattle. On the other hand, Uruguayan government is paying between 50 and 65% of the identification costs of about two Euros including the ear tag and the electronic device.

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