

# National Livestock Identification Scheme

## A new era in identification, traceability and livestock management

Alliance Consulting and Management

PO Box 1209

ROMA QLD 4455

Ph/Fax: (07) 4622 6823

Email: mahern@allianceconsulting.com.au

*Rick Beasley and Matt Ahern*

---

### **Background**

### Introduction

More than thirty years ago, Australia introduced a system of tail tagging to identify the property of consignment of livestock. This proved very successful in the eradication of bovine tuberculosis and brucellosis. Although faced with difficult terrain, Australia remains one of the few countries which has managed the eradication of these diseases.

About ten years ago, it was appreciated that better systems of identification and traceability would be required and research was commissioned by the Australian Meat and Livestock Corporation to find suitable technology for the permanent identification of livestock.

This led to the establishment of the National Livestock Identification Scheme (NLIS). The scheme was pressed into service in 1999 in response to demands from the European Union that the traceability systems were not adequate for supply of beef to that market.

Pertinent identification and lifetime traceability schemes are now becoming the norm in most of Australia's beef marketing competitors and major markets for beef. Countries implementing permanent identification schemes include all the member states of the European Union, New Zealand, Canada, Japan, Brazil, Uruguay, and Botswana.

---

The NLIS is a national program run under the auspices of SAFEMEAT, the government and industry partnership responsible for red meat safety and integrity. The program is conducted by Meat & Livestock Australia and is currently funded by producer and processor levies.

### NLIS structure and objectives

This structure is different to nearly all other countries implementing permanent identification schemes where the programs are government run regulatory programs. The NLIS has a number of industry-based committees responsible for the policy direction and technical standards.

The scheme is voluntary in all states except Victoria, which introduced legislation in 2001 to phase in the mandatory use of NLIS in that state. Under the Victorian legislation, all cattle born after January 1 2002 must be identified with NLIS devices prior to leaving their property of birth. Requirements for all devices to be read at abattoirs and saleyards and all movement transactions to be recorded on the national database will be phased in to be fully completed by January 1 2005. Other states are presently considering similar arrangements.

The objectives of the NLIS are to:

- Assist the Australian cattle industries to retain access to, and remain competitive in key export and domestic markets
- Enable government agencies and industry to respond quickly and effectively to future livestock disease, chemical residue and food safety incidents
- Enhance and support quality assurance, genetic improvement and residue and disease control programs

- Enhancing arrangements for preventing livestock theft and identifying stolen cattle
- Improve on-farm productivity by facilitating better herd monitoring and management
- Improve the efficiency of data exchange between all sectors of industry including carcase feedback data, market eligibility compliance to specification and residue and disease status information.

---

## NLIS technology

In all other countries implementing similar schemes, identification is by visual tags, typically with a bar-coded enhancement. Australia is the only country in the world, which has opted for a national scheme based on electronic identification.

### ***ISO standards***

Australia has adopted the international ISO standards for livestock identification. These standards (ISO11784 and 11785) are now reflected in the Australian standards AS5018-2001 and AS5019-2001. These standards define the frequency and code structure of the transponders and ensure the uniqueness of numbers.

### ***NLIS standards***

While the ISO standards define the basic technology used, devices need to have high retention rates, good readability, persistence over time and tamper resistance. These and other issues are covered in the NLIS standards. Once a manufacturer can establish that devices will meet these requirements, they are accredited for use within the NLIS system. To date, five devices (two ear tags and three rumen boluses) have been accredited.

### ***Full and half duplex devices***

The ISO standards allow for both full (FDX-B) and half duplex (HDX) devices. While hand held readers can successfully combine both technologies, dual panel readers have not yet been demonstrated to work effectively. Consequently, the NLIS standard uses HDX only technology at this time. The standard does allow for new technology to be introduced once certain conditions are met.

### ***NLIS numbering***

Each microchip has a unique unalterable electronic number burnt onto the chip. This is referred to as the radio frequency identification (RFID). In addition, the ear tags have an externally readable number (NLISID) marked on them. In the case of the rumen bolus, this number is displayed on an associated ear tag. This number contains the Property Identification Code (PIC) of the property where the device was applied, information regarding the manufacturer, device type and year of manufacture as well as a user defined individual animal number. These two numbers are associated at manufacture of the device and the information recorded on the database can be accessed using either number.

### ***Ear tags and boluses***

Both ear tags and rumen boluses are accredited for use within NLIS. Boluses have an associated ear tag to indicate the presence of the bolus and to display the visual number. The ear tags are either white (breeder devices) or orange (post-breeder devices). Breeder devices are applied to cattle still on their property of birth while post-breeder devices are used to identify introduced cattle, which have not previously been identified with a NLIS device and are no longer on their property of birth.

## Common readers

It is essential that all NLIS devices can be read with common readers. All NLIS accredited devices, regardless of manufacturer, will be able to be read with the same reader. Readers can be hand held or panel readers. Hand held readers are portable and generally less expensive but the read range is often less. Panel, or fixed readers allow for full automation but are generally more expensive and more difficult to move from yard to yard.

## NLIS database

Meat and Livestock Australia have established a national database to support the NLIS. This database has also taken over the Extended Residue Program (ERP) database, which holds lists of Property Identification Code's which have a known residue risk status.

The NLIS database is a web-enabled system allowing stakeholders to access only data they are entitled to view and to only make changes where permitted. Each stakeholder group has different access screens and different functionality.

Because the devices can be read, stored and transmitted electronically, the manual recording and input to the database is minimal. Around 96% of all data into and out of the database is in electronic form, allowing the NLIS database to be able to be run with a staff of three.

The database holds information regarding the animal history, its movements throughout its lifetime and a range of statistics. These statistics can relate to specific disease or residue risk statistics and market eligibility information. In addition, information can be stored on lost or stolen cattle, livestock mortgage register, and specific treatments or eligibility for specific programs such as organic production or breed specific marketing programs such.

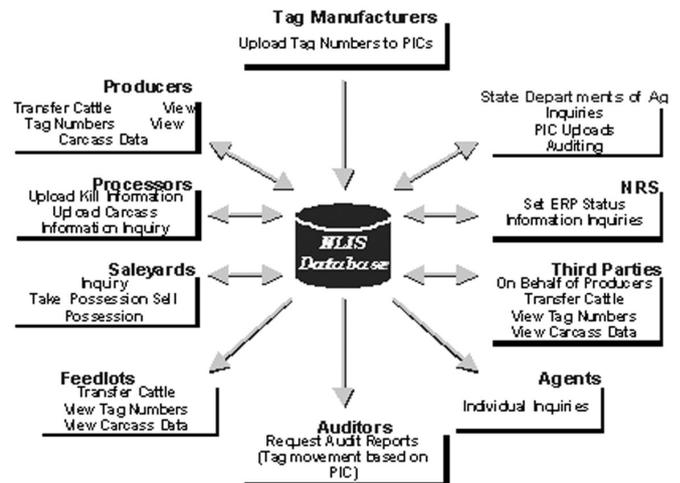


Figure 1. NLIS database access for different industry stakeholders

The scheme commenced with the introduction of the new arrangements for the supply to the EU in December 1999. Since then, the system has grown as shown in Figure 2.

The original impetus for the scheme was the million tags supplied to producers by the Victorian government and accreditations for the supply to the EU. The EU accreditations have now reached a plateau but growth is continuing outside this sector. Numbers of devices have grown rapidly since the announcement of the introduction of mandatory identification in Victoria.

## Infrastructure

It is essential that infrastructure is available at saleyards and abattoirs to read devices and communicate with the database. Considerable effort and government and industry resources have been spent in this area. Specific software has been developed to allow abattoirs to be able to automatically communicate with the central database.

To date, there are almost 50 saleyards throughout Australia with these facilities and there are over 25 abattoirs with readers and database connections. Almost 1200 cattle producers have electronic accounts with the central database.

## Implementation

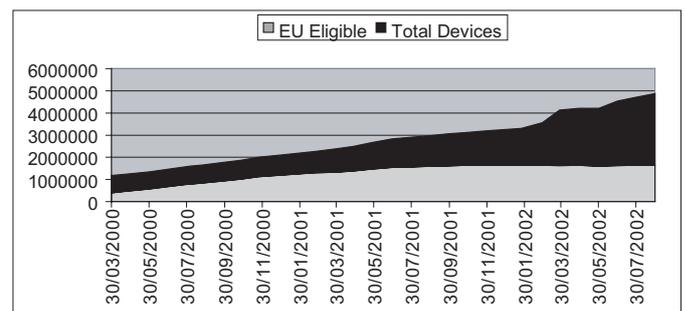


Figure 2. NLIS accredited device numbers

### ***On-farm usage***

While the main thrust of the NLIS is for reasons of product integrity and animal health and residue control, there are very significant on-farm benefits associated with the use of electronic identification.

The ability to record each animal electronically and accurately allows for more information to be collected and analysed. There are a number of software packages now developed which are designed to operate in conjunction with electronic identification and allow data capture and retrieval crush-side. Electronic scale heads are also becoming more intelligent and have the capability to store and retrieve data other than weights.

The NLIS database now has the functionality to receive and distribute carcase feedback from abattoirs. This will ensure that post-slaughter information from a number of sources can be brought together and made available to authorised parties in a standardised format. On-farm software systems can then import this data and, through the common electronic identifier, link carcase data with live information such as pedigree, feeding and management data.

### ***Future directions***

The NLIS database will continue to be developed to improve interaction and functionality. A range of interfaces and file formats will be developed for specific stakeholder requirements.

It is likely that other Australian states will follow the model adopted in Victoria and move to phase in the mandatory use of NLIS. This is likely to take a number of years before full implementation across all states.

The information carried on vendor declarations becomes more useful if linked to the transaction history of the animal. A movement to electronic vendor declarations, with the information from each declaration stored against the animal history would give Australia the most complete and accurate traceability system in the world.

---

## Conclusion

The National Livestock Identification Scheme is considered a world leader in Livestock Identification technology. In addition to the benefits associated with whole of life livestock identification, traceability and product integrity from a market access perspective, NLIS provides opportunities for the industry in terms of automated collection, analysis and sharing of valuable information on individual animals to improve productivity and increase compliance to market specifications. Further development of NLIS and investment in appropriate industry infrastructure could see the scheme become a valuable tool for beef producers across Australia.

