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## Research and Information Service Briefing Paper

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# Overview of selected animal registration and traceability systems outside NI – main features and costs

## 1 Background and context

This briefing paper provides a brief overview of selected animal registration and traceability systems in use outside of Northern Ireland. The selected systems are compared in terms of their key features and costs.

The context for this paper is provided by DARD's proposal to develop a new Northern Ireland Food Animal Information Service (NIFAIS) to replace the current Animal and Public Health Information System (APHIS) which went live in 1998.

The requirements for the identification of farmed animals within Northern Ireland are as a result of EU legislation including:

- **Council Regulation EC No 1760/2000<sup>1</sup>** - establishing a system for the identification and registration of bovine animals and regarding the labelling of beef and beef products;
- **Council Directive 2008/71<sup>2</sup>**- on the identification and registration of pigs;
- **Council Regulation 21/2004<sup>3</sup>** - 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.

Council Regulation EC No 1760/2000, which had its origins in the mad cow disease crisis, set out requirements for those keeping cattle within the EU. Every Member State was required to set up a cattle identification and registration system. This system must comprise the following elements:

- ear tags to identify animals individually;
- computerised databases;
- animal passports;
- individual registers kept on each holding.

Given these requirements many countries from outside the EU who wished to export to the EU decided to align with many of these requirements themselves.

Table 1 within the paper provides details of current animal registration and traceability systems operating outside of Northern Ireland when compared to APHIS, but it should be noted that directly comparable information has been difficult to find.

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<sup>1</sup> [REGULATION \(EC\) No 1760/2000 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL 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, 17th July 2000](#)

<sup>2</sup> [COUNCIL DIRECTIVE 2008/71/EC on the identification and registration of pigs, of 15 July 2008](#)

<sup>3</sup> [COUNCIL REGULATION \(EC\) No 21/2004 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, 17 December 2003](#)

## 2 Overview of APHIS and comparable systems currently operating outside NI

Table 1: key characteristics –animal identification and traceability systems

Country	System name	Year introduced	Species covered	Key features	Costs	Updates
Northern Ireland	APHIS (Animal and Public Health Information System) – provides a centralised repository of information on food animals	1998	Cattle Sheep Pigs Goats Birds	<ul style="list-style-type: none"> <li>• Keeper registration and movement information on cattle, sheep, pigs, poultry, goats and horse establishments</li> <li>• Deals with animal registration – particularly the births and deaths of cattle</li> <li>• Provides disease status info eg TB, BR</li> </ul> <p>Cattle</p> <ul style="list-style-type: none"> <li>• Register cattle births, deaths and stillborns.</li> <li>• Produce movement notification of cattle moving a herd to market, abattoir or farm.</li> <li>• Confirm cattle movements into a herd.</li> <li>• View and download a herd list including information about animals DARD statuses, TB &amp; Br test results and export eligibility.</li> <li>• View movement and progeny history of every animal in a herd</li> <li>• View post and ante mortem details of slaughtered animals.</li> </ul>	<p>Costs from 1998 to July 2014 estimated at £24.3 m – annual cost of £1.42m<sup>4</sup></p> <p>Establishment and administration costs borne by DARD</p> <p>Individual farmers have to meet the cost of tags</p> <p>In the instance of sheep EID DARD provided capital funding to enable the purchase of readers etc.</p>	Proposed Northern Ireland Food Animal Information System (NIFAIS) – due for phased introduction (initially for cattle) in 2017.

<sup>4</sup> DATA provided by DARD Veterinary service

Country	System name	Year introduced	Species covered	Key features	Costs	Updates
				<ul style="list-style-type: none"> <li>Produce a report to count and classify animals in accordance with the Nitrate Action Programme.</li> <li>Upload data conveniently from your farm software management package (not available on all software packages)</li> </ul>		
GB	CTS (Cattle Tracing System) – administered by British Cattle Movement Service	1998	Cattle – separate systems for sheep and goats and pigs	<p>Cattle</p> <ul style="list-style-type: none"> <li>Each cow is issued with a passport – number of passport is matched in ear tag on animal</li> <li>report births, movements and deaths and get receipts for your transactions</li> <li>access a list of all the cattle on your holding, see their details and look at the history of your herd</li> <li>view your holding's transactions for the last 6 months</li> <li>see if there are any problems with your transactions and send BCMS information to resolve them</li> <li>order bar code labels and forms</li> </ul>	<p>£15 million a year – does not include tag costs borne by farmer<sup>5</sup>.</p> <p>The estimated costs of establishing the CTS have been estimated at being £13million of which £3.5 million went on the development of the database<sup>6</sup>.</p> <p>In 2003 a further £12 million was invested to upgrade the CTS system</p>	<p>2001 Departmental review developed a vision for livestock identification covering cattle, sheep and pigs – with a single point for collecting data from keepers.</p> <p>Proposal to achieve the vision through the so called Livestock Identification and Tracing (LIT) Programme. LIT was allocated funding of £136 million between 2003-4 and 2005-6 – including £46 million in capital investment<sup>8</sup>.</p> <p>Pilot LIT scheme was undertaken in carried out between 2005 and 2007 to estimate detailed costs and benefits but development was suspended in May 2006 – no data beyond this date.</p>

<sup>5</sup> ibid

<sup>6</sup> [Cattle Passports, Parliamentary question by Mr Jack MP to the Minister of Agriculture, Fisheries and Food, Thursday 4 Dec 1997 \(PQ 18831\)](#)

Country	System name	Year introduced	Species covered	Key features	Costs	Updates
					and to improve its performance <sup>7</sup>	
Republic of Ireland	Animal Identification and Movement (AIM) system - successor to the as Cattle Movement Monitoring System –	1998	Cattle sheep, pigs and goats	<p>Cattle</p> <p>Guarantees the safety of beef and beef products by the operation of an effective animal identification and tracing system.</p> <p>System has four elements:</p> <ul style="list-style-type: none"> <li>• tagging,</li> <li>• bovine passport,</li> <li>• on-farm bovine herd registers and</li> <li>• a computerised database (AIM)</li> </ul> <p>The Animal Identification and Movement (AIM) records identification and movement data on cattle, sheep, goats and pigs.</p> <p>AIM system is a database which records all bovine birth, movements and disposals. The system captures details of all animal movements and this information is used to verify the origin, identity and life history of cattle entering the food chain. It is also used to check compliance of cattle with eligibility criteria of the Single Payment Scheme</p> <p>AIM works in tandem with the Animal Health Computer System in facilitating the maintenance of a high health status of the animals.</p>	<p>2009 value for money review<sup>9</sup> identified the costs of AIM as follows:</p> <p>The capital cost of developing CMMS and AIM is fully financed by the Exchequer which to date amounts to approximately €19m. Over the 2004 – 2007 period expenditure on maintenance of the database was approximately €1.38m per annum.</p> <p>Tag costs are borne by farmers</p>	Lack of data
Botswana	Livestock	2001	Cattle	Utilises a reticular bolus with an RFID chip	Fully borne by the	Lack of data

<sup>8</sup> [Identifying and Tracking Livestock in England, National Audit Office report, 2003, page 35](#)

<sup>7</sup> [Cattle Passports, Parliamentary question by Mrs. Curtis-Thomas to the Secretary of State for Environment, Food and Rural Affairs, 15 September 2003 \(PQ 129065\)](#)

<sup>9</sup> [Value For Money Review of the Bovine Animal Traceability System \(2004-2007\), Department of Agriculture, Fisheries and Food 2009](#)

Country	System name	Year introduced	Species covered	Key features	Costs	Updates
	Identification and Traceability System(LITS) <sup>10</sup>			<p>generally inserted at 3 months old</p> <ul style="list-style-type: none"> <li>• Individual identification, registration and traceback of cattle and beef</li> <li>• Computerised system</li> <li>• Brings together separate cattle, animal disease and manual brand databases in a single computerised system</li> </ul>	<p>Botswana government – initial set up costs of US\$35 million</p> <p>Cost to farmers for the individual reticular bolus utilised for identification new about US\$2.50 and</p>	
Australia	National Livestock Identification System <sup>11</sup> (NLIS) - system for identifying and tracking all cattle through their life	1999 (initially as a trial in Victoria)	Cattle initially but expanded to other species – namely sheep and goats	<p>Permanent, whole-of-life system that allows cattle to be identified and tracked from birth to slaughter.</p> <p>Cattle are identified with a RFID tag (ear or rumen bolus) to identify individual animals</p> <p>The NLIS database is the central repository for electronically recording movements.</p> <p>Tags are colour differentiated –white indicates that animal was born on the premises (breeder device) and orange that it was bought in (post breeder device).</p>	<p>The estimated annual operating cost of the national NLIS system is \$5 million (CAD). This covers staff, along with hardware and software updates. The greatest proportion of costs is incurred by the NLIS helpdesk, which employs up to 50 people<sup>12</sup>.</p> <p>NLIS ear devices is around AUS\$3.00 each + GST + a handling fee. The</p>	<p>Work undertaken in 2013 in relation to upgrading the National Livestock Identification System (NLIS) for sheep and goats.</p> <p>3 options considered as part of Regulatory Impact Assessment as follows:</p> <p>Option 1: Enhanced mob based system - enhancement of the existing mob based system with improvements in the verification and enforcement of business rules throughout the supply chain.</p> <p>Option 2: Electronic Identification (EID) system - the EID of animals with exemptions for sheep and goats sold directly from their property of birth to abattoirs or export</p>

<sup>10</sup> [http://www.moa.gov.bw/downloads/lits\\_faq.pdf](http://www.moa.gov.bw/downloads/lits_faq.pdf)

<sup>11</sup> <http://www.agriculture.gov.au/SiteCollectionDocuments/about/nlis-report.pdf>

<sup>12</sup> <http://vcm-international.com/wp-content/uploads/2014/09/Australias-Traceability-System-Case-Study-August-2014.pdf>

Country	System name	Year introduced	Species covered	Key features	Costs	Updates
					rumen bolus is a little dearer	depots.  Option 3: EID without exemptions.
Canada	Canadian Livestock Tracking System – administered by the Canadian Cattle Identification Agency <sup>13</sup>	2001	Cattle – separate systems exist for sheep, bison and pigs	<p>3 basic elements: animal identification; premises identification; and animal movement.</p> <ul style="list-style-type: none"> <li>• Designed for the containment and eradication of animal disease</li> <li>• As of July 2010 all cattle must be tagged with a RFID tag prior to moving from their current location or farm of origin</li> <li>• Provides accurate and efficient trace back information by use of a national database.</li> <li>• Allows for the electronic reading of numbers without previously required line of sight</li> <li>• Ensures Canada has an accurate and comprehensive age verification system – includes birth data.</li> <li>• Provides the necessary basis for full animal movement tracking</li> <li>• The information maintained at the CCIA office includes date, record of individual unique number and link to the herd of origin and packing plant</li> <li>• The information is secure and the CCIA will only provide information from those records to the Canadian Food Inspection Agency in the event of a request for trace back for health or safety reasons</li> </ul>	Initial funds for the CCIA were received through a grant from the Beef Industry Development Fund. Additional funds to be used for trials and development have been approved through Agriculture and Agri-Food Canada, the Canadian Food Inspection Agency and a number of provincial governments and private industry organisations.	No indications from available data of major or radical upgrade

<sup>13</sup> [http://www.canadaid.com/about\\_us/faqs.html](http://www.canadaid.com/about_us/faqs.html)

Country	System name	Year introduced	Species covered	Key features	Costs	Updates
				<ul style="list-style-type: none"> <li>Age verification is used to enable animal birth date data to be associated with an animal identification number</li> </ul>		
New Zealand	National Animal Identification and Tracing (NAIT) <sup>14</sup>	2009	Cattle Deer	<ul style="list-style-type: none"> <li>Uses RFID ear tags</li> <li>Low frequency technology is used for NAIT RFID tags (FDX and HDX tags)</li> <li>Once tagged animals are located on a national database. Information recorded includes                             <ol style="list-style-type: none"> <li>The animals location</li> <li>Movements in the animal's life</li> <li>Contact details for person responsible for the animal</li> </ol> </li> <li>This enables traceability in the event of a biosecurity incursion</li> <li>The information collected can be used to trace back to source of disease and implement testing regimes</li> <li>Increases consumer confidence and food traceability</li> </ul>	<p>Government met the capital expenditure of building the NAIT system</p> <p>NAIT's shareholders covered the running costs during the development phase.</p> <p>NAIT's shareholders are DairyNZ, Beef + Lamb NZ and Deer Industry NZ</p> <p>The NAIT scheme is funded by government and through levies:</p> <ul style="list-style-type: none"> <li>35% of NAIT's ongoing costs are met by government</li> </ul>	<p>Nothing proposed at present but there could be scope for adoption of UHF data tags. OSPRI New Zealand (OSPRI) who deliver NAIT have a number of priorities for the scheme as follows:</p> <ul style="list-style-type: none"> <li>Increase awareness and acceptance of the scheme</li> <li>Increase compliance</li> <li>Make it easier for farmers to use the system</li> </ul> <p>Achievement of these priorities appears to be focused on incremental improvement and promotion of the scheme rather than a radical upgrade</p>

<sup>14</sup> <http://www.nait.co.nz/about-us/>



Country	System name	Year introduced	Species covered	Key features	Costs	Updates
					<ul style="list-style-type: none"> <li>65% of NAIT's ongoing costs are recovered by tag and slaughter levies</li> </ul>	

### 3 Observations and questions

After consideration of the data in table 1 the following observations are made and questions posed

- Cattle are the key species driving the creation, maintenance and development of these systems – as reflected by the fact that some countries only appear to operate traceability and identification systems for cattle or chose to develop the system for cattle initially before extending it to other species;
- Whilst EU regulations have directly influenced the development of many of these systems (not just of EU Member States), due to the need to ensure access to the EU market, some systems appear to meet the minimum EU requirements whilst others exceed them. This does raise the question as to whether those countries that exceed the minimum requirements do so a result of direct design or whether they exceed the EU requirements as a result of meeting the requirements by adding to existing systems?;
- In general terms it is hard to directly compare animal identification and traceability systems due to the fact that these systems tend to be tailored to meet the specific needs of the agricultural industry operating within the country/region;
- APHIS appears to be quite unique in terms of the range of data that it holds compared to the systems identified here in terms of the data that it holds and how this can be used – animal health data in particular is mostly held in other databases within other jurisdictions that may or may not be compatible with the traceability and registration systems;
- The challenge of developing a multi species single database for animal identification and traceability data appears to have proven too much for the authorities within GB given the apparent failure to deliver the so called Livestock Identification and Tracing (LIT) Programme despite considerable expenditure ( £136 million between 2003-4 and 2005-6 – including £46 million in capital investment). Whilst no evaluative data has been found by the researcher relating to the project the reasons for the failure of this project and any potential lessons for the development of NIFAIS would be of value;
- With all the systems identified, individual value for money and comparative cost with other systems is difficult to establish. The Value for Money review of the Irish AIM system did however conclude that the ‘...system provides value for money in terms of cost, efficiency of delivery and achievement of objectives, and it merits public funding<sup>15</sup>. Costing data is available for a number of the systems and this does suggest a variation in both set up and running costs (NI running costs of £4m annually, ROI €1.38million annually for example) but these figures lack contextual information such as the number of species and total number of animals involved, and as such direct comparison is not recommended;

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- Rather than focussing on the question of cost in relation to these systems, there might be greater value in ensuring that the maximum benefits are derived from the system. This has a particular resonance with the development of NIFAIS – how will data collected from the new system be utilised by DARD, other parts of government, academia etc in order to achieve the following<sup>16</sup>:
  - Control and eradicate particular farm animal diseases;
  - Deliver health programmes for TB, BR, BSE, EBL and for industry led disease control schemes;
  - Protect animal welfare;
  - Detect improper use of medicinal and growth promoter products;
  - Comply with grant schemes;
  - Confirm compliance with Farm Quality Scheme conditions;
  - Support the marketing of animals and animal products;
  - Facilitate trade by streamlining imports and exports.

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<sup>16</sup> [NIFAIS: a computerised animal information system to replace the current APHIS system, Easy read leaflet, DARD](#)