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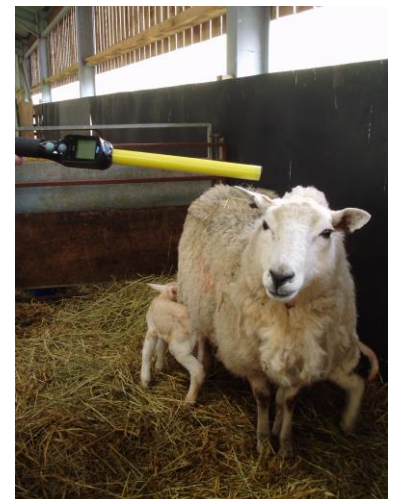
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Electronic Identification: Making the most out of compulsory tagging¹

Dr Claire Morgan-Davies & Harriet Wishart²

Summary

- Electronic Identification (EID) is a compulsory requirement introduced in 2010 in the UK sheep industry for breeding animals over 12 months old. For younger slaughter animals, regulations vary between Scotland and the rest of the UK.
- Many have seen the introduction of EID tagging into the sheep industry as burdensome; however, it can present a fantastic opportunity to improve a flock if used as a management tool.
- EID tags can aid data collection and are individual specific.
- Using EID tags can greatly decrease the time required for handling animals and can help sort (draft) individuals into appropriate management groups.
- A properly calibrated sheep automatic drafting weigh crate can simultaneously weigh and draft over 500 animals per hour, saving much needed time for the farmer and reducing handling stress for the animals.
- Recording tag numbers and weights electronically is much more accurate than recording by hand, with few opportunities for errors to occur. Additionally, once recorded, the data can be stored and easily transferred/uploaded to other farm management programmes for further use.
- Data collected on individuals (such as weight change) can be used to enhance flock characteristics or specific desirable traits which can aid whole flock improvement. This could offer an opportunity for farmers to improve productivity or market driven qualities, particularly in larger, more extensive farms.
- Decreased handling of individual animals through the use of an automated weigh crate can improve welfare and reduce stress which can have negative impacts on production, particularly at key periods such as early pregnancy. It can also increase the health and safety for those involved in handling the animals.



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<http://www.scotland.gov.uk/Topics/Research/About/EBAR/StrategicResearch/future-research-strategy/Themes/Theme5>

² Hill and Mountain Research Centre, Future Farming Systems, SRUC. E: Claire.Morgan-Davies@sruc.ac.uk; harriet.wishart@sruc.ac.uk

Introduction

Electronic Identification (EID) became a mandatory requirement for the identification of sheep in 2010. Prior to this, tagging had been used in both the cattle and sheep industry for over 60 years, most often in the form of self-piercing plastic ear-tags. The purpose of tags is to identify the animals individually to help monitor and track animal movements from one holding to another.

Tagging is an important part of livestock traceability, not only for the consumer to be sure of the end-product's provenance, but also for monitoring and controlling disease outbreaks such as Foot and Mouth Disease (FMD) in 2001 and 2006.

Much of the legislation regarding sheep movements and tagging were introduced after the FMD outbreaks, when issues surrounding tracking of sheep were raised.

This Policy Briefing will outline what EID technology is and how it can aid management options on sheep farms. It will discuss some of the issues surrounding the use of EID tags and will highlight possible policy implications for using this technology on Scottish farms.

Background to the introduction of EID tags

EID was introduced into livestock farming in the early 1980s, to monitor and track animal movements from one holding to another more accurately. Within Europe, EU legislation requires the identification and registration of bovine, ovine, caprine and porcine animals as well as equidae to improve livestock traceability.

Research programmes were initiated and sponsored by the European Community in the early 2000s on electronic identification of ruminants (e.g. the IDEA Project³), in particular small ruminants. Following these programmes, legislation on EID was introduced for the various species.

For instance, the current system for the identification and registration of bovine animals requires in particular, a double ear-tag with individual code. For sheep and goats, the current system for identification and registration is based on Council Regulation (EC) No 21/2004. One of the elements of this regulation is a requirement for double individual identification; animals must be identified by an ear-tag and a second means of identification (2nd ear-tag or tattoo or electronic transponder⁴).

In the UK, prior to 2010, not all animals had to be tagged. It is now compulsory that all breeding animals over 12 months old require an EID tag that is unique to them within that flock.

There are some differences in the regulations between Scotland and the rest of the UK regarding electronic identification. Younger slaughter animals (12 months or younger) in Scotland require an electronic identification tag⁵ whereas in England and Wales this was not necessary until recently⁶.

³ Ribó, O., Korn, C., Meloni, U., Cropper, M., De Winne, P., & Cuypers, M. (2001). IDEA: a large-scale project on electronic identification of livestock. *Revue Scientifique et Technique-Office International des Epizooties*, 20(2), 426-436.

⁴ Legislative requirements for the identification and registration of bovine, porcine, ovine and caprine animals within the European Union. Sprenger, K. U.; Pauw, R.; Speedy, A.; Mäki-Hokkonen, J.; International Committee for Animal Recording (ICAR), Roma, Italy, ICAR Technical Series, 2007, 12, pp 47-56

⁵ Scottish Government (2013) Sheep and Goat identification and traceability – guidance for keepers in Scotland. <http://www.scotland.gov.uk/Resource/0043/00433374.pdf>

⁶ England changed to an EID slaughter tag from 01/01/2015 <https://www.gov.uk/sheep-and-goats-identification-registration-and-movement> Wales is proposing to introduce them from 01/01/2016 <http://wales.gov.uk/topics/environmentcountryside/ahw/farmanimaltracing/sheepandgoatidentification/?lang=en>

The Technology Explained

There are various forms of EID which are a type of Radio Frequency Identification (RFID). EID can be in the form of an ear-tag or a bolus in the stomach. Some of the advantages and disadvantages of these options are described in Table 1.

The current EID tags used in the UK are **low frequency**, with a relatively low read range (about 20cm) and work passively, i.e. the information they contain can only be read⁷. The next generation, known as **ultra high frequency**, have read/write ability and information can be written directly to the tag⁸. The read range is also far greater. Whilst commercially available, the uptake is still minimal. Further development of EID technology is required to improve usability and uptake.

EID readers are used to read and collect the individual ID number stored on the EID tag, bolus or implant. As well as different types of tags there are also different commercially available readers, which are either handheld or panels. Panel readers are attached either to a race wall or fitted within a weigh crate; both systems read the EID as the animal passes by but the latter is also able to record EIDs against weights. Digital weigh heads have also been developed to collect, store and use information about each individual EID tagged animal that passes through an automatic weigh crate. The handheld readers are particularly useful when collecting a list of individual EIDs from animals in a race or a pen as the tags are only read once. The list of EIDs from these animals is then stored in the reader. It can be printed or downloaded and used with other softwares.

Farm management software companies sell these readers to customers so information collected on farm can be uploaded into farm management softwares stored on a PC or online. More recently these companies have developed mobile applications designed to be used on mobile phones or tablets, so that information about animals can be entered live whilst on farm.

Table 1. Advantages and disadvantages of the different types of EID

Types of EID ¹	Advantages	Disadvantages
Bolus	Good read rates Tamper-proof	Require greater skill to administer Food safety concerns Not as easy to read as tags
Ear-tag	Easy to attach Evident which animal is tagged Cheaper	Can be tampered with (removed or replaced) Can be lost more easily

⁷ DEFRA (2013) Electronic identification (EID) in sheep: Your technical guide.

<https://www.gov.uk/government/publications/electronic-identification-eid-in-sheep-technical-guide>

⁸ Ruiz-Garcia L and Lunadei L (2011) The role of RFID in agriculture: Applications, limitations and challenges. Computers and Electronics in Agriculture 79, 42-50.

The Management Options

The main improvement and benefit to the farmer relates to mandatory record-keeping (medicine, deaths and movements), which is made easier by using the EID technology. However, on farms, there is further potential for EID to be used to improve:

- *Breeding:* EID can support data collection for EBVs (Estimated Breeding Values). Breeding information can be stored and linked to the EID number of the animals, and easily retrieved for later use. It can also help at mating time, to identify and sort the animals into different mating groups.
- *Health and welfare:* EID can ease and improve record keeping of health treatments of individual animals. As any information relating to health or treatment is linked to the EID tag, it is readily available and can be flagged up when the animal's tag is being read. The latest research also focuses on lamb worming management which can contribute to minimising anthelmintic resistance⁹.
- *Productivity and labour:* Weight data collection using handheld electronic devices (e.g. readers) can be used subsequently to manage individual animals based on their weight change. For instance, researchers at SRUC are trialling a targeted approach to winter feeding of the ewes, based on individual weight change recorded using this system. Potential links to abattoir data collection are also being researched, as a means for farmers to obtain more accurate feedback on the animals being sent to slaughter, on an individual basis. Auto-sorting animals (via the combined use of an EID reader and weigh crate) also eases farm handling and can save labour on farms¹⁰.

EID Issues/Problems

There are of course some barriers that have prevented the sheep industry from benefiting from the full potential of EID. The industry has seen EID tagging to be rather burdensome¹¹, as the EID tags are more expensive than the non-EID ones, with no immediate obvious bonus. This is a key motivation for ongoing research to investigate and demonstrate the potential benefits of the technology to farmers.

Additionally, although the handheld readers are more affordable (starting at ~ £150-£200), the costs of the sheep handling facilities (fixed EID reader, weigh crate and auto-drafter) required to realise the full potential of EID are currently high, requiring large capital expenditure which many sheep farmers feel they cannot afford.



⁹ In collaboration with Moredun Research Institute, SRUC is testing a Targeted Selective Treatment approach for lamb worming, based on individual animal weight change as assessed by EID, under hill farm conditions. This approach substantially decreases wormer use and can help prevent anthelmintic resistance in flocks.

¹⁰ See SRUC YouTube video on "Maximising the benefits of sheep EID" - (<https://www.youtube.com/watch?v=PJO7-3XSsIU>)

¹¹ Mottram, T. (2011) Investigating the suitability of electronic identification in livestock. *Veterinary Record*, 169 (10) 247-248.

However, these problems can be overcome. For instance, in Wales, a group of farmers and industry representatives collaboratively used Rural Development Programme funds to support farmers to use electronic recording systems in their sheep flocks and to enable them to benchmark flocks/individual animals (central database), as a means of improving the efficiency of Welsh sheep production systems and the quality of lamb they produced (TAG (Technology, Agriculture and Greater Efficiencies) project¹²). The up-coming Scotland Rural Development Programme could also be used in a similar way by farmers or crofters.

Reliability and readability of the tags have also been found to be an issue for some farmers, as raised by Brian Pack in his report "Doing Better Initiative"¹³. Although tag readability both on farm and at abattoirs is good, read rate can be reduced when readers are not installed or set up properly¹⁴.

Policy Implications

- Improvements to the Scottish sheep industry can be made using EID technology, such as easing animal data collection, improving accuracy and speed of recording, reducing the level of labour required at handling time, creating more opportunities for animal management (for example, worming strategy). However, further support (financial and training) is required to maximise the potential benefits of EID technology for livestock management.
- Face-to-face training and support (such as that used in Wales), and on-farm demonstration of how to use the technology, are means of information dissemination that are valued by farmers, and therefore should be supported to encourage uptake.
- Initiatives to help share the costs of the technology are needed to improve uptake amongst sheep farmers, such as, for instance, the TAG project in Wales.
- Combining the use of electronic identification with data collection for genetic improvement (EBVs) could encourage sheep farmers to make better use of the available technology to improve animal performance and, thereby, farm efficiency and profitability.
- The future CAP (Pillar I) will demand comprehensive, accurate and up to date records for compliance to the Basic Payment Scheme, and using EID in that capacity could help farmers, provided there are adequate tolerance levels due to potential tag losses. However, under the proposed CAP Pillar II, there is no obvious route within the SRDP to support farmers to acquire this type of costly technology, despite the recognised need to improve farms efficiency and profitability within the hill areas of Scotland.
- The removal of the Land Management Options from the CAP will also restrict/limit the uptake/potential of using EID technology. To make it a success story for Scotland novel approaches to providing funding support for supply of equipment or guidance on usage is required.

For more information on the work of SRUC's Rural Policy Centre, please contact: Dr Jane Atterton, Manager and Policy Researcher, Rural Policy Centre, SRUC, T: 0131 535 4256; E: jane.atterton@sruc.ac.uk; W: www.sruc.ac.uk/ruralpolicycentre

¹² <http://www.menterabusnes.com/tag>

¹³ <http://www.scotland.gov.uk/Publications/2014/08/2494>

¹⁴ DEFRA (2014) Defra's response to ALIDMA's study of Electronic identification (EID) tag reading. <https://www.gov.uk/government/publications/defra-s-response-to-electronic-identification-eid-tag-reading-study>