



Introduction of mandatory electronic identification of cattle in Denmark

O.K. Hansen

Danish Cattle Federation, Livestock Registration and Milk Recording, Agro Food Park 15, DK-8200 Aarhus N, Denmark

Abstract

Electronic identification (EID) of cattle in Denmark is by regulation mandatory as of 1. July 2010. Denmark is the first EU member state to introduce mandatory EID of cattle, but for sheep and goats in EU it has been mandatory as of 1. January 2010. This paper discusses the background and the considerations before this decision was made and describes how it will be implemented.

Keywords: identification, cattle, EID.

1.0 History

1.1 Identification in general

Denmark was the first country with regular milk recording schemes starting in 1895. Here of course individual identification of cows is necessary and it was done by ear notching.

This system was used until 1982 when Danish Cattle Federation (DCF) introduced the current numbering system with premises numbers and nationally unique lifetime numbers and lifetime ear tags for animals in milk and beef recording schemes (herdbook animals). At that time the average herd size in milk recording was 40 cows. The change was coordinated with introduction of a cattle database in 1984.

Until 1991 metal ear tags were used. These provided very poor readability. The farmer had to catch the animal and often to clean the metal tag to be able to read the number. As of 1991 plastic ear tags with good readability are used.

In 1995 DCF asked for a national legislation to make identification and registration of all cattle in a central national database mandatory. This was in order to enable control of all movements of cattle in order to help eradication of infectious diseases such as IBR (Infectious Bovine Rhinotracheitis). However, no national legislation was made until EU-legislation was published in June 1997. At that time the numbering system built by DCF was adopted by Danish authorities. The national database already had 70 % of all cattle registered and the remaining 30 % were registered before March 1998. At that time the average herd size in milk recording was 65 cows.

1.2 Electronic identification

In 2001 Danish Meat Board representing slaughterhouses and DCF made a study on feasibility of EID followed by a test in eight herds 2001 – 2003. The test covered aspects from daily farm management to automatic identification when entering the slaughterhouse.

DCF has actively followed experience gathered in Australia, Canada and other countries already implementing mandatory EID in cattle.

In 2007 DCF asked for national legislation mandating EID of cattle.

In 2008 DCF, Veterinary Services of Denmark, and the Department of EU Control made a joint test of transponders and transceivers. The test covered aspects from reading distance to practical use of handheld readers and panel readers. In 2009 DCF finalized a report on technical and economic aspects regarding EID. At the same time the Ministry for Food, Agriculture and Fisheries published a report on possible ease of administrative burdens for farmers. Now the average herd size in milk recording was 135

cows and still increasing. In December 2009 finally the regulation on mandatory EID for all cattle in Denmark was published.

2.0 Technical aspects

2.1 Selection of devices

When EID is a voluntary solution used only for automating identification of animals for daily management purposes quality issues may be left to the market place. If the user is not satisfied with the product he has to discuss it with the manufacturer or he might choose products from another manufacturer. This is how manufacturers improved the quality of products over time simply to stay in the market.

When EID becomes mandatory by law the situation is different. The competent authority must approve products for the official identification scheme and they must check that the products satisfy relevant quality criteria. Products with bad performance cannot be approved but still there may be options for the farmers to choose among a list of approved products.

Also the competent authority must ensure that the identity of animals moved can be read where the animals arrive. Thus EID products approved must be conforming to general standards for the country and possible even internationally.

ICAR is the Registration Authority of ISO and has for almost 15 years been active in testing and approving conforming devices to ISO 11784/11785. In animal identification these standards are the basic standards. Previous ICAR test protocols have now been transformed into the ISO 24631 standard but ICAR still is the Registration Authority. You can find all ICAR approved devices on the ICAR website.

2.1 ISO conformance and performance

2.1.1 Transponders

Transponders approved for official identification of cattle in Denmark have to be ICAR approved for ISO 11784 and ISO 11785 conformance, which means they have to pass the ISO 24631-1 test. In addition they have to be performance tested according to ISO 24631-3.

The test made by DCF in 2008 with six types of tags all tested against five types of readers provided useful information about reading distances, which could later be related to the ISO 24631-3 test when it started in late 2008.

The transponders chosen for cattle in Denmark all have a minimum activation field strength under 0,6 A/m (115,6 dB μ A/m) and a modulation amplitude higher than the EU requirement for transponders for sheep and goats. Transponders for sheep and goats in EU must have a activation field strength at or under 1, 2 A /m (121, 6 dB μ A /m) and a modulation amplitude at or above 10 mV at a field strength 1,2 A/m.

In comparison to all other transponders currently tested by ICAR the cattle transponders chosen in Denmark are in the upper 33% when we talk about expected read range.

2.1.2 Transceivers (readers)

The read distance for a transponder depends on several factors including the transponder (see above section) and the transceiver. The transceiver must deliver sufficient field strength to activate the transponder. When activated the transponder must respond with a signal strong enough to be received by the transceiver. In addition the transmission may be hampered by electronic noise from the environment. Laboratory testing of read distances must be done under controlled and identical conditions, which means actual read distances in practice might be different. These are the reasons why it is not possible to guarantee exact read distances.

In Denmark there are no official requirements on transceivers. The use of transceivers on farms is voluntary so the performance requirements are to be agreed between user and supplier. DCF very strongly advocates the farmers buy "ISO readers" which are readers capable of reading HDX and FDX-B transponders at almost same performance level. This goes for handheld readers and panel readers, bought separately or as built in readers in barn equipment.

2.1.3 HDX and FDX-B

Transponders with the same performance test results from ISO 24631-3 test will to the best of our knowledge perform equally independent on HDX or FDX-B technology. The reason for discussions about HDX and FDX-B performance might be a bigger variation in performance among products coming from a big number of manufacturers of FDX-B products compared to a lower number of manufacturers of HDX products.

Transponder performance should never be compared without an ISO 24631-3 test. When you compare tractors from different companies you would always ask how much power each tractor provides. The parallel situation when discussing transponders is to ask for the performance test results on transponders from different technologies and manufacturers.

As for tractors the performance needed from transponders depends on the task to be done. Previously I discussed performance criteria for sheep and goat applications compared to cattle applications. The performance test can only provide performance information. Performance criteria need to be defined for different applications.

2.0 Economic aspects

1.1 Where EID is useful

The overall goals by introducing mandatory EID are easier everyday herd management, improved data quality in registration, improved food safety, and improved farm economy.

EID is able to ease identification in milking equipment, feed stations, weighing animals, separation gates, surveillance, and moving animals etc. The rapid growth in herd size means that EID solutions are feasible for ever more herds. We have seen already that the number of herds voluntarily using EID is hastily growing.

EID will also be able to ease identification when outside personnel apply services such as milk recording, AI-service, veterinary treatment, hoof trimming, transporting, slaughtering, and rendering. Not only is the identification of animals quicker, it is also more reliable and electronic transfer of the identity read takes out mistakes from misreading and miswriting of data. In order to harvest the advantages at full scale it is important that all animals are electronically tagged as soon as possible. When harvesting the benefits at full scale EID is also economically feasible for smaller herds.

1.2 Estimated cost benefit

The following benefits are based on estimated time saving at normal events in herds after EID tagging of all animals, and the economy is estimated as saved working hours at a normal salary for those events:

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| 1. Better and more effective herd management and implementation of new technique
13 € per cow and year : | Total 6.7 million € |
| 2. Easier identification and registration in AI-service
0,25 € per first service: | Total 173,000 € |
| 3. Easier identification and registration in veterinary service
1.33 € per visit: | Total 800,000 € |
| 4. Easier identification and registration in milk recording
40 € per visit: | Total 2.0 million € |
| 5. Easier identification and registration in hoof trimming
0,40 € per trimming: | Total 240,000 € |
| 6. Easier identification and registration in transporting
0,40 € per moved animal: | Total 350,000 € |
| 7. Easier identification and registration in slaughterhouse
1,33 € per slaughtered animal: | Total 650,000 € |

8. Easier identification and registration in rendering plant 0,40 € per rendered animal:	Total	40,000 €
9. Easier identification and registration in markets, shows, etc. 0,80 € per animal:	Total	80,000 €
10. Easier identification at authority on farm inspections One working hour per inspection:	Total	67,000 €
Annual savings:		11.1 million €
Estimated extra cost for EID tags:		1.0 million €
Readers etc. for service providers:		670,000 €
Annual costs		1.67 million €

The desire to use automated identification for on farm daily herd management is decided by the farmer himself and so the costs for on farm readers are not considered a part of costs from introducing mandatory EID.

Benefits arise from time savings in registration of animal identities and in handling fewer errors in registries. Some of the time savings are harvested directly by the farmer and have no impact on invoiceable costs. Benefits harvested by service providers should eventually come back to the farmer when service providers invoice their services.

Benefits for the competent authority cannot alone cover the cost of implementing mandatory EID.

Off farm benefits cannot alone cover the cost of implementing mandatory EID.

Benefits for service providers are more than double of the extra costs. This means that even farmers not utilising electronic reading themselves will benefit from the introduction of mandatory electronic identification.

More than 50 percent of possible benefits are directly on farm.

The benefits will not be fully harvested until all animals have been electronically tagged. This is expected by 2015. For the first couple of years after implementing the regulation the investments will be higher than the benefits.

3.0 Administrative aspects

The above estimated cost benefit is valid only when all cattle is electronically identified. The interest of service providers to invest in portable transceivers and automated data capture depends on the proportion of animals with EID.

Introduction of EID could be done by three different regimes:

1. Voluntary use of EID

10–15 percent of tags sold in recent years were electronic tags, so the system already exists. Only farmers seeing personal benefits will start using EID. Risk that transponders used in voluntary on farm applications do not follow internationally agreed standards and do not have ID-codes unique outside the specific farm where applied.

Voluntary use means it will take long time before service providers and authority inspection body want to invest in reader equipment and automatic data capture.

2. Use of EID in all animals tagged after fixed date

The system provides gradual implementation so that service providers etc. can incorporate the benefits after a few years.

Farmers and service providers will gradually learn the benefits related to EID, which will improve the interest of voluntary EID tagging of animals born before the start date.

The cost of EID tagging will from the start be at the same level as normal future operating cost.

15 – 18 months after the start date heifers for AI-service, and the AI service might be interested.

At the same time bulls for slaughter will wear EID, and the slaughterhouses might be interested. 27 months after the start date first calves in dairy herds will wear EID and the veterinarians might be interested.

Three years after the start date approx. 15 percent of the Danish cattle population would still not be EID tagged. After four years it would be approx. 10 per cent. At such time the authorities might decide mandatory EID tagging of all animals not yet wearing EID.

3. Retagging of the whole population within a short period

After a very short while (months) everybody (farmer, service provider, authority etc.) will be able to implement all benefits from EID.

However, it would be necessary to retag the full existing cattle population incurring a lot of extra work and extra cost at a time when the benefits of EID have not been evident in practice.

Variations of the three main regimes have been discussed and also questions regarding funding of EID. One variation was to exempt smaller herds from mandatory EID. Another variation was that bigger herds paid a small levy for EID tags. The levies could then have funded the extra cost of EID in smaller herds even if the EID tagging would still be mandatory for all.

By December 2009 option 2 was chosen and a regulation was issued making the use of EID mandatory for all cattle to be tagged after 30. May 2010.

Information letters were sent by Danish Veterinary Services to all keepers of cattle in Denmark in December 2009. DCF has sent further information in its newsletter early March 2010 and by a special letter again reaching all keepers of cattle in Denmark by the end of April 2010.