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Application of different transponder variants with cattle (IDEA project)

Field trial results

In an EU field investigation different transponder variant were investigated for suitability in practice. In the German part of the project around 45,000 cattle on a total 285 farms were marked by electronic earmarks, injection transponders or boli. As a further part of the project data were collected for recording success of identification, loss rate and recovery. Of all the transponder variants investigated the electronic earmark is currently the most favoured.

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Keywords

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Literature

Literature details are available under LT 02417 via Internet at http://www.landwirtschaftsverlag.com/landtech/local/fliteratur.htm

The reliable identification of domestic animals has steadily increased in importance. The documentation of national and regional origin will in the long term be required especially in the beef premium segment. Nowadays, reliable animal identification is also an indispensable basis for an efficient, large-area combating of epidemics and an absolute requirement for reliable conducting of support schemes. For such tasks, electronic animal identification shows some advantages over conventional marking systems, the former offering an individual automatically readable identification for all requirements and with that making possible a very efficient and specific classification of data.

The IDEA project

The aim of the EU large-scale investigation IDEA was to compare different components of electronic animal identification under the given variety of production conditions in several countries [1]. In Germany from April 1999 until the end of 2001 only cattle were marked for this purpose. All transponders and scanners used were checked before the investigation by the EU joint research office (Joint Research Center, Ispra, Italy) and certified as meeting the established standards for electronic animal identification (1SO 11784 / ISO 11785).

In the German part project trained staff marked a total 44388 cattle of different breeds with injection transponder, bolus or electronic earmark (*table 1*) on 285 farms. The majority of marked animals were feeding bulls with a smaller proportion of milk and suckler cows as well as calves brought into the trial. Alongside information on the material and its practicability, data was also collected on its functionality and reliability in information transference as well as ease of removal in slaughterhouses. This information was subsequently transmitted to a central databank.

Results

The evaluation of the collected data showed that the applied transponders suffered definitely less loss compared with the currently accepted official earmarks. Instead of up to 15% [2] the losses in the field investigations here reported were much less for all three variants. Electronic ear markers coming from two of the three manufacturers supplying this trial had a loss rate of only 1%. These two types (Allflex S.A. and Nedap B.V) differed from the official ones in size and shape, being smaller and round so that they could be attached in a more sheltered position within the ear opening. The registered loss rate for the injected transponders and boli was under 0.3% although it must be noted here that three from a total 8700 animals carrying a bolus died after the insertion. In two cases the cause was diagnosed as a performation of the oesophagus (animal age at application 6 to 7 weeks). In the third case (animal age around 3 months) no post mortem examination was conducted. An inflammation reaction was registered in four cases amongst the animals (18145) with injected transponders and three of these were

Table 1: Overview of transponders used in the IDEA-Project

Transponder variant	Manufacturer/ Supplier	Technology	Number of treated animals
Injected transponder, 23 mm	Allflex Europe S. A.	HDX	18145
Bolus	Allflex Europe S. A.	HDX	8700
Electronic earmark	Allflex Europe S. A. Hotraco Micro ID B. V. Nedap Agri	HDX FDX-B FDX-B	9425 2391 5727
Total			44388

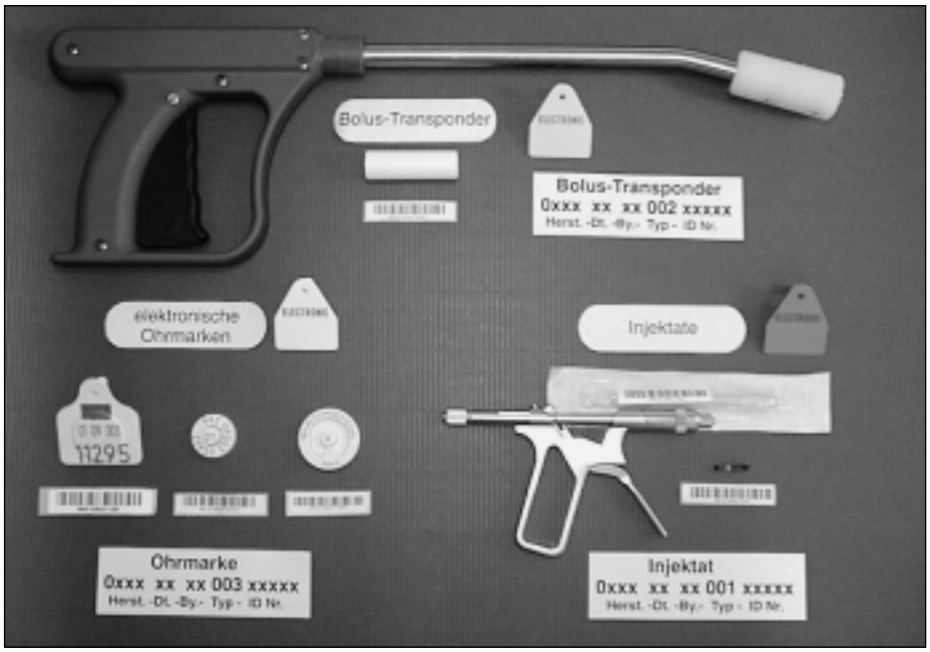

Fig. 1: Transponders used in field (IDEA-Project)

successfully treated with antibiotics. In one case meningitis was diagnosed whereby it could not be completely determined whether this had a connection with the transponder injection.

Positive experience regarding readability of the boli signals [3] could only be confirmed to a limited extent in the field trials. Thus some boli could not always be scanned by the hand-held scanners used in the project. Here, young calves were relatively simple to check. But because scanning distance was too limited with the equipment used, results could be uncertain with cows and feeding bulls. The weakness of identification hereby lay not with the identification signal but rather with the functionality and operating reliability of the scanner [4]. In general, checking the feeding bulls was problematical. These were loose-housed in groups in pens. Where the animals were meant to be identified from the passage with a hand-held scanner the current scannable distance of from 30 to 50 cm was not enough. Under the assumption that cattle in a crush could be singled out there exists the possibility of applying a stationary scanner with substantially greater operating distance and, with that, improved identification reliability.

In the six slaughterhouses involved, the IDEA animals represented a very small proportion of total livestock throughput. This meant additional effort in removing transponders during the daily slaughter routine. Despite this, the removal rate happily lay by 78.6% in total. For the injection transponder, bolus and electronic earmark the removal rates were 73.6%, 79.3% and 83.7% respectively. Under the assumption that in future the majority of animals delivered to slaughterhouses will be fitted with transponders it can be expected that the work routines will be further optimised and, with that, the removal rates further improved.

Evaluating the transponder variants

According to experience so far, all three transponder variants (injection, bolus and earmark) are in principle suitable for the general system of electronic identification of animals. However, as far as attachment/insertion of transponders is concerned there are certain advantages and disadvantages regarding marking, identification and removal. A summarised evaluation is shown on *table 2*. Should the electronic identification be introduced as quickly as possible as official identity sign, then the electronic earmark is at the moment the most practical variant. It can also be combined with a visual earmark with the same number One should be aware here, however, that through the external attachment there is less protection from manipulation For evaluating the security, however, the whole identification system including databank supported documentation of the animal number has to be considered.

Characteristic	Bolus	Injection	Electronic earmark
Application	+	+*	++
Scanning by hand-held instrument	-	+	++
Scanning via processor technology	+/-	+	++
Slaughterhouse removal	+	-	++
Loss	++	++	+
Access protection against removal of the information carrier	++	++	+**

Table 2: Comprehensive evaluation of different transponder types

++ very positiv, + positiv, - negativ * assumes trained personell
** in combination with databank

Summary

Transponders for electronic identification have reached a high technical standard. The establishment for a comprehensive system for automating animal identification does, however, depend on scanners that must be capable of meeting the requirements of agricultural practice. Here further developments in the actual operation and in scanning distance are required. In certain circumstances additional mechanical preparations for singling-out animals and/or reducing speed of movement are necessary in order to realise the required automated identification, especially in slaughterhouses but also in all other operation venues.