

Heiko Georg, Gracia Ude and Anja Schwalm, Brunswick

New Aspects in Electronic Animal Identification – Part 2

In a study about the introduction of electronic animal identification (eTK) in cattle keeping with electronic ear tags, a questionnaire was given to experts and a cost-benefit appraisal was calculated. Part of the results were already published in Landtechnik 3/2008. The farmers regard a mandatory eTK positively, since they expect synergy effects. Model calculations indicate that the costs arising will be reasonable. Farmers, who do not want to use eTK, only pay the cost of the electronic eartag. For dairy farms, annual costs will probably range between 7.50 and 13 € per head.

In Germany, the identification of animals and thus the introduction of electronic identification for animals (eTK) is the responsibility of the Federal States. In some Federal States, electronic identification is voluntary. This raises the question of costs and benefits for farm businesses. This paper reports on the investigation of costs and benefits using a questionnaire based farm survey using a questionnaire. Some results have already been reported [1]. Further results are presented here.

Materials and methods

We have already provided a description of the survey technique [1]. Three dairy farms were surveyed in each of the States of Bavaria, Lower Saxony and Thuringia. The Thuringia farm businesses passed their questionnaire to other businesses with the result that we received 5 completed forms from Thuringia along with the three responses from each of the states of Bavaria and Lower Saxony. This sample size is too small to give confidence that the results are representative of dairy producers in these States. A fully representative survey would have required issuing questionnaires to 1000 dairy farmers and a response rate of 8 to 10 %.

Results

All farmers registered and deregistered animals in the HI animal database over the in-

ternet. The conventional mail is no longer used. Seven farmers favoured replacing the left ear tag for tagging and one favoured the right. Two farmers had no preference with respect to which ear tag to replace. The multiple use of tagging is in demand, e.g. for the identification of calves at automatic milk replacer feeders. The reason for preferences included that optical ear tags are always on the right side and most farms are equipped better to read these in the day-to-day management of animals. In one case, optical reading of the conventional tag is done in the rotary milking parlour.

If all facilities were equipped with ring antennae, the choice of ear would be largely irrelevant.

The question of advantages and disadvantages for the farm business generated a neutral to generally very positive response. Electronic identification technology was seen as 'useful' to 'very useful' in farm and herd management with a score of 7 to 9. With a score of 5 to 6, respondents viewed the technology neutrally to 'very useful' with respect to HI-Tier database, managing the herd register, and labour input. The score in relation to monetary costs and benefits was only 3 to 4, i.e. no preference. With the exception of economic benefits, more than half of the farmers assess the effects as 'useful' or 'very useful' (Fig. 1).

Dr. agr. Heiko Georg, Dr. agr. Gracia Ude and Dr. med. vet. Anja Schwalm are scientists at the „Institut für Agrartechnologie und Biosystemtechnik“ (Head: Prof. Dr. K.-D. Vorlop and Prof. Dr.-Ing. A. Munack) of Johann Heinrich von Thünen-Institut (vTI), Bundesallee 50, 38116 Braunschweig; e-mail: heiko.georg@vti.bund.de

Keywords

Cattle, electronic identification, traceability

Literature

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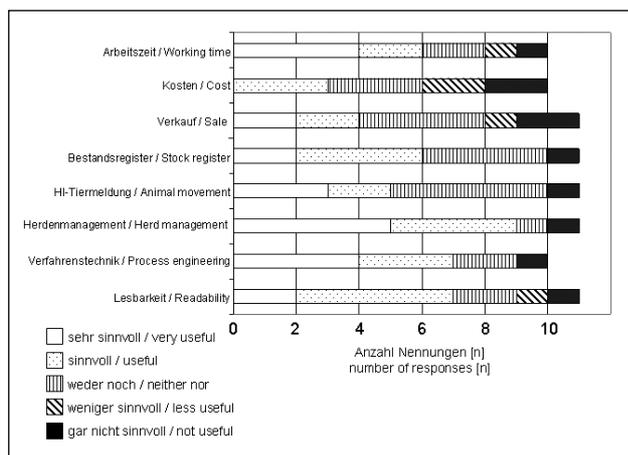


Fig. 1: Assessment of electronic animal identification (eTK) by the farmers

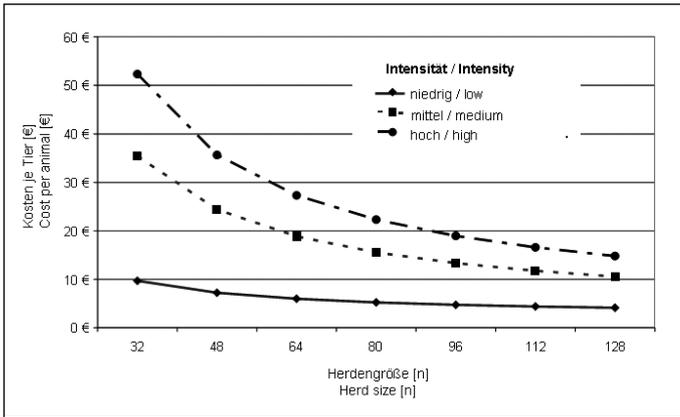


Fig. 2: Costs of different equipping intensities per animal, depending on herd size

Technical equipment	low	Intensity medium	high
Electronic identification	850.00 €		
Bluetooth-electronic identification		1200.00 €	
Electronic weighing		3000.00 €	3000.00 €
Automatic reading			2700.00 €
Software		700.00 €	700.00 €
PC		1000.00 €	1000.00 €

Table 1: Costs of eTK for different equipping intensities

Economic assessment

Suckler cow and beef production generally involves use of less technology, compared with milk production. Three intensities of technical investment were assumed in the economic modelling.

In the low technology variant, it was assumed that animals are weighed using a mechanical scale, either owned or borrowed. Electronic weighing facilities are assumed to be used in both the technically intensive variants, with the most technically advanced variant equipped with automatic reading within handling facilities. The economic modelling is based on the assumption that the electronic animal identification can be used in suckler and beef herd management, in particular in selecting animals for branded meat marketing programmes, which require animals with particular weight and growth characteristics. If, e.g. animal prices are affected by a target bodyweight, investment in this advanced weighing technology could be economic for even small farm businesses. The costs of the three levels of technology in Table 1 are presented detailed in Figure 2. Hard- and software depreciated in four to six years and an interest rate of 4.5 % is assumed. A price of 2.25 € per identification set (per animal) is also assumed.

Based on our own survey information, the economic modelling of milk production assumes that 80 % of transponders need replacing after being used over one cow lifetime in the herd [1, Part 1] und [2]. In the most favourable situation, existing antennae in the milking parlour are ISO-compatible based on HDX- or FDX-communication (or both) and can be recognised by the electronic tags. In such situations, the continued purchase of transponders is no longer necessary leaving only the cost of the eTK, assumed here to be 2.25 € per set.

In the case that the existing animal detection technology in the milking parlour is not compatible with the eTK, replacement or

modification of equipment must be considered. It is assumed that two new detectors in animal runs would be needed. The ‘milking parlour detection only’ variant assumes that a concentrate feeding station (CF) is not used, because a total mixed ration (TMR) is fed. If detection equipment on a concentrate feed station is used further or replaced, the antenna must be moved from its position on the trough to a higher position to interact with the ear based device. Because concentrate feeding stations have a limit of about 50 cows each, more stations are assumed for larger herds (Fig. 3). This accounts for the steps in the curves covering the variants ‘Milking parlour + concentrate feeders’ and ‘Milking parlour + concentrate feeder + selection unit’. A ten year useful life for the system is assumed for calculating the annual costs per animal. A third variant adds the facility to select animals from the herd, which is available in many new dairy units or existing large herds. Annual costs of 7.5 to 13.0 € are calculated for dairy units with 120 up to 250 cows (Fig. 3).

Where calves are reared on an automatic milk feeding station, equipment can be modified quite easily to identify individuals as long as the electronic tag is in the left ear to align with the standard used by a large producer of automatic feeders. Older systems (ten years old) based on electronic tags attached to the normal optical ear tag may be compatible. However, the attachment of such tags to conventional optical ear tags leads to increased tag losses.

Fig. 3: Annual costs of eTK for different equipping variants, depending on herd size

