

Experience with an Electronic Identification System for Cattle

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Allen Trenkle, professor of animal science

Summary

An electronic identification system involving placement of transponders in rumen boluses was evaluated in thirty feedlot steers. All the devices were retained and remained functional in the steers. Twenty-eight of the devices were recovered at the packing plant. Two of them were lost because of an incomplete understanding that attempts were being made to recover the boluses from rumen contents. Use of rumen boluses is a practical alternative for electronic identification of cattle that is permanent and nearly tamper proof.

Introduction

Reliable identification of cattle is important for establishing ownership, and for health management, food safety, disease control and genetic evaluation. As cattle producers learn to use value-based marketing opportunities, it will be important to collect data on individual animals to cull breeding animals based on knowledge of performance of offspring. A dependable identification system is needed to track animals from birth through the packing plant and in the future beyond packing plants to retail stores. A dependable system is one that is retained with the animal, can be read as cattle progress through the production sequence and can be interfaced with a record system. The system must be automated to track large numbers of animals. Several companies are developing electronic identification devices (EID). Some of these contain transponders that are located in ear tags, others place the transponder in a small glass capsule that can be placed under the skin, and others place the transponder in a bolus that is placed in the rumen of cattle. The purpose of this paper is to relate experiences of using a system that had the transponder in a bolus.

Methods

AVID, Norco, California, developed the EID system used. The microchip was in a 20 x 75 mm ceramic bolus (Figure 1) weighing approximately 70 grams. Boluses were read with a hand-held scanner (AVID Power Tracker II, Figure 2), their numbers matched with the visual ear tags, and were placed in thirty 950 lb steers using a balling gun. The steers were fed a finishing diet containing 80% cracked corn, 12% alfalfa pellets and 8% supplement. After being placed in the animal the device could be read by placing the scanner on the right side of the animal posterior to the shoulder blade. If it could not be read from that location, moving to the left side resulted in a successful reading.

Activating the microchip with the reader displayed a nine-digit number. For this study the reader was not interfaced with a computer program. The nine-digit numbers were manually recorded.

The cattle were harvested at two beef packing plants. One location was a small plant that processed up to twelve animals during a four-hour period once per week. The other location processed about 800 animals per eight-hour shift.

Results and Discussion

All the devices were retained in the steers and could be read when the animals were restrained in a chute. All the devices could be easily read following stunning and hanging of the cattle on the rail, by holding the scanner above the brisket. At the small packing plant the boluses could be found with the reader and were recovered from the reticulum. At the larger plant the viscera were transferred downstairs from the processing floor where the rumen contents were emptied to recover the tripe. Again the boluses were easily recovered from the contents of the reticulum. All of the boluses were recovered from the eighteen steers processed at the small plant. In the larger plant, ten of twelve were recovered. One was lost because the viscera were condemned and sent directly to condemned offal. One bolus was not recovered for unknown reasons, but we suspect that the first one sent downstairs was missed or the viscera were sent to condemned offal. In another study conducted elsewhere, it was observed that 80% of the boluses had migrated from the reticulum to the ventral sac of the rumen. The boluses probably remained in the reticulum in our study because of the lack of coarse roughage in the diet, which would reduce rumination and movement of masses of digesta within the rumen and reticulum.

Equipment was in place at the larger plant to read ear tags having transponders. This plant routinely recovered those tags by removing them from the ears, removing the pins, cleaning them in a washing machine and recycling the tags through another group of cattle. The personnel at the plant expressed some enthusiasm for the boluses as an EID system because they would be easy to recover, clean and recycle. It would be a simple modification in the plant to place a coarse screen in the stream of rumen contents to recover the boluses. Rinsing the boluses in water is sufficient to clean them.

Advantages of the bolus EID are their capability for 100% retention and their being virtually tamper proof. These two features may be significant advantages for electronic identification of breeding animals. It would be possible to locate an antenna directly in the handling system and interface the reader with computer software to automate reading and recording of the identification numbers. One

disadvantage of the boluses is that if the transponder becomes nonfunctional, the number cannot be obtained. Some systems with transponders in ear tags print the identification number on the tag. As more equipment is developed to read systems from several companies, it seems that the use of the bolus system could be an effective identification system for segments of the ranching and feeding phases of cattle production.

Figure 1. Ceramic bolus with microchip embedded inside. The size of the bolus is 20 x 75 mm and weighs about 70 grams.



Implications

A system that involved placement of a transponder in a rumen bolus was found to be an effective method for electronic identification of finishing steers.

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Figure 2. Hand-held reader used to activate and read the microchips placed in rumen bolus EID.

