

Electronic Identification Product Testing and System Development in Sheep and Cattle

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Over the past several years, the need for permanent and traceable animal identification has become increasingly evident. While the technology has existed for over twenty years, the application to livestock enterprises has remained minimal in the United States. With increased public demand for food safety, and increased industry standards in biosecurity, mandates for animal identification are on the horizon. A major challenge to livestock producers in the United States is the implementation of system that works within their enterprise, as well as seeing economic benefit from such a system. The objectives of this project were to test different electronic identification (EID) products and their usefulness in a sheep and cattle production setting, as well as the development of a complete EID system for Colorado State University that could be used as a model for livestock producers.

Mature breeding ewes and yearling ewes housed at ARDEC, Fort Collins, Colorado, were utilized to test the efficacy of rumen boluses, provided by EZ-ID in Greeley, Colorado, as a means of electronic identification. Ewes had previously been administered boluses, and the readability of the boluses was measured twice during the summer. 39 ewes with boluses were also randomly selected at the first reading to have a microchip placed in the caudal fold to compare readability of permanent EID methods. Readability of microchips was measured, and migration of the chip was to be observed if the ewes were euthanized. In addition to testing readability, the accompanying computer program for data collection was also utilized on a chute side computer. Cattle on a feedlot study (n=195) were ear tagged with EZ-ID visual ear tags containing electronic chips. The readability of the tags was measured at the time of tagging and 28 days post-tagging. Retainability of the tags was noted at 28 day intervals until cattle were harvested. Development of an integrated EID system was researched and proposed to Colorado State University. Several options were analyzed, combining different EID devices and equipment, computer equipment, and software for data collection. The proposed system utilized ear tags as the identification product, chute-side laptops for data recording directly from the scale and EID reader, hand held computers for data collection in the field that could download information into the main file system. The goals of the proposed system were to improve data collection for research and serve as a model for ranchers wishing to implement an identification system.

The readability of the large rumen boluses were 65.1% (28/43) at the first reading; 52.6% (20/38) at the second reading. Miniboluses readability was 98.6% (68/69) at the first reading; 94.7% (54/57) at the second reading. Microchip readability at the time of administration was 100% (39/39); 90.3% (28/31) at the second reading. Retainability of the ear tags was 99.6% during the span of the study, while the readability was 65%. Three options were proposed for Colorado State University, with set-up costs ranging from \$10, 445-139,695, regardless of herd size. Recommended identification method cost ranged from \$2.00-4.50 per animal. As of yet, none of the options has been implemented.

While boluses provide a means of permanent identification, the poor readability and difficulty in usage make them impractical for most livestock producers. While ear tags would be simpler to use, the inability to ensure that they remain with the animal for its

lifetime is an issue. However, the need for some sort of EID system is necessary, as mandates for such systems will eventually be put into action. Challenges that need to be dealt with when designing a system are costs, usefulness to the producer, availability of systems in other locations where livestock will be traveling (i.e. packing house), the need for a national, uniform, and accessible database, and an infrastructure to mediate rapid tracebacks. Some of these challenges will or already have been met with resistance, making that an additional challenge to incorporation of a national system.