



Value of Individual Record Keeping to Commercial Livestock Operators

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November 2005

There are a number of potential benefits associated with the use of individual animal identification systems. The objective of this fact sheet is to describe how individual animal identification and analysis technology might impact producers' income. These impacts may be the result of either an increase in returns due to premiums received for additional information about the sale cattle, or through increased management of individual animals and decreased emphasis on managing the whole herd as a single unit. It is possible that price premiums may decline in importance over time as more producers use individual identification systems, and individually identified animals become the *de facto* standard.

Animal ID May Provide Access to New Markets and Price Premiums

Producers and allied industry may use the National Animal Identification System (NAIS) to initiate data collection across all production segments (traceback) and thereby differentiate their products leading to increased income through price premiums. Loader and Hobbs¹ speculate that traceability in the beef industry may have hidden benefits, including the reorientation of the industry towards the consumer.

Differentiated products and specialized markets
Differentiated products often contain both content and process quality attributes valued by the consumer that cannot be verified through physical inspection. Examples of such quality attributes include free-range, organic, natural, and lean, as well as many others. These attributes are indistinguishable to the consumer at the time of purchase unless products are labeled to indicate that they contain these attributes, or there is a mechanism to communicate this information to the consumers in some other way. A recent UC study documented premiums paid to producers who sold "natural" beef (non-implanted, no antibiotics, no ionophores).² While some of the premiums a producer may glean from participation in such "natural programs" will be offset by expenses associated with meeting the program requirements,

producers who adopt identification systems may discover that their cattle qualify for more lucrative marketing opportunities. The only way to verify many of these quality attributes is through record-keeping, which establishes and documents that the attribute(s) actually exist in the product. Food traceability systems can be designed to provide the breadth of information necessary for this type of quality attribute verification.

The decision as to how or whether to adopt individual animal identification will hinge on the value of the benefits derived from collection of individual animal data and tracability. Adoption will be rapid if the resulting benefits are high. Pacific Rim trading partners are requiring documentation to verify age and origin of beef destined for their markets. Some marketing alliances are taking advantage of this requirement to ensure that their products will be among the first shipped to this market since the December 23, 2003 Bovine Spongiform Encephalopathy (BSE) case. A few auction yards are developing programs through which participating producers can verify age and origin of their cattle. In all cases, having a workable individual animal identification program in place is the first step. The data associated with the NAIS may satisfy special processing market requirements, and therefore the costs of the NAIS may be partially or wholly offset by price premiums resulting from specialized marketings. Ideally, record keeping costs will be entirely covered by market premiums.

Many of the quick-service restaurants, including McDonald's, Jack in the Box, and Red Lobster, desire meat from processors who ensure high safety standards. Rewards for meeting stringent safety standards include guaranteed sales through marketing contracts and premium pricing.³ Meat processors who want to protect "high safety" markets will look to cattle producers who can provide evidence of safety procedures in production through animal identification and record-keeping. In fact, McDonald's plans to have a minimum of 10% of its U.S. beef purchases source traceable by the end

Ranch	N	Carcass weight		Marbling		Yield grade		Backfat thickness		Ribeye area	
		Below	Above	Below	Above	Below	Above	Below	Above	Below	Above
A	205	2.0	14.4	49.2	18.3	0	19.8	1.0	17.9	8.2	2.9
B	253	6.0	17.9	45.5	24.3	0	16.7	0.2	13.7	8.6	14.2
C	454	4.7	27.3	47.3	26.7	0	43.8	0.2	42.9	7.9	4.8
D	183	1.3	55.3	41.5	24.9	0	50.3	0.9	43.4	2.8	13.3
E	111	12.6	14.4	45.9	14.2	0	30.3	0.6	19.5	15.2	5.6

Table 1. Percent of carcasses by ranch projected below or above specifications^a for carcass traits.⁵

^a Specifications: carcass weight 272 to 363 kg, YG 1.5 to 3.5, ribeye area 71 to 96.8 cm², backfat thickness 0.25 to 1.52 cm, marbling score 4.7 (marbling of Slight +, quality grade of Select +) or greater.

of 2004, and 100% source traceable in the near future.⁴ McDonald's hopes its traceability policy will instill consumer confidence in its ability to contain food safety problems quickly and manage any associated ramifications.

Finished cattle processing and fabrication

In general, the processing sector of the beef industry mass produces high quality and very safe beef products. But in the context of implementing individual identification and subsequent traceability systems, the processing sector has system constraints. For example, a packer may not have a buyer for beef at the final stage of the packing process. Therefore, throughout the production process, the packer will frequently not know if the buyer is interested in or willing to pay for traceability. Consequently, some packing firms view beef traceability as an "all or nothing" situation for a particular production plant, since the packer does not know what proportion of product requires traceability. This means that every product has to be traced, or the packer may not sell in the marketplace requiring traceability. In other words, the buyers of meat who require traceability will have to pay more for that service so that the packer can recover traceability costs. Or the packer can choose not to sell to buyers that require traceback. It may be that in the future they will have no choice but to maintain traceability. The multiple products being produced from each carcass are distributed widely during the beef fabrication process, and this means that in most of the current beef processing facilities, it is difficult to trace a specific beef cut back to an individual carcass, animal, or producer. Thus, the same modern U.S. processing technology that allows carcasses to

be efficiently turned into beef products causes logistical challenges and potential increases in costs associated with traceback of individual product to the original animal or farm. This disconnect between the farm-of-origin, live animal, carcass, and its beef products is why the NAIS is referred to as a "live animal" identification and traceback system versus a complete "beef" or "meat" traceback system. The question still remains as to whether the economic incentives (market access and/or consumer driven) exist to drive processing plants to invest in the development of new individual animal ID technology that will facilitate farm-to-fork traceback.

Animal ID May Aid in Production Efficiencies

Individual animal identification systems not only allow for the breadth of information needed for quality attribute verification, but they can also provide the information needed to track an animal's performance from weaning to harvest and enable the identification of individuals with the most profitable genetic merit. Ranchers can use performance measurements at all stages of the production process (cow-calf, stocker, feedlot, and packer) to manage animals and sell off low performing cattle before spending additional dollars. For carcass traits such as yield grade, as much as 50% of the calf crop may have values outside of industry recommended standards (Table 1).⁵ Culling some animals based on these data, or not saving heifers from cows based on the dam's performance is one potential benefit from keeping individual records. Additionally, replication (increase) of identified optimal and profitable genetics can increase herd performance over time, resulting in cost efficiencies and improved profits.

There are a number of software programs available, especially for the cow-calf segment of the industry, that can be used to keep individual performance records. Those complying with the National Cattlemen's Beef Association standardized performance analysis (SPA) definitions are:

- **Angus Beef Record Service (BRS)**
(816)383-5100 www.angus.org
- **CattleSoft CattleMax Software**
(877) 454-2697 www.cattlesoft.com
- **CHAPS**
(701)227-2348 www.chaps2000.com
- **CowCalf5**
(402)762-4357 www.cowcalf.com
- **Cow Sense**
(800)584-0040 www.midwestmicro.com

Most of these allow analysis of individual cattle records to allow for the identification of superior (or inferior) animals. An Oklahoma State summary of these types of programs is available at <http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Document-1926/CR-3279web.pdf>.

Implementation

Whether these programs will work for an individual cattle producer depends on their management ability and commitment to use the information to make improvements. The likelihood and costs of adopting individual identification and analysis technology may define those who will benefit from increased production efficiencies or price premiums from specialized markets. Most operators have less than 100 head of cattle (92 percent of the operators in California have fewer than 100 head) and the cost of the technology may be high for smaller herds. They may contract with third parties or have centralized marketing organizations perform the identification. This may restrict their opportunities to incorporate enhanced or additional management information. Larger herds can spread fixed costs of the technology over many cattle, and they will likely have greater flexibility and opportunity, as well as lower implementation costs, to collect information that is beneficial for management decisions and marketing.

Producers that have a moderate-sized herd may face a dilemma in that they may be simultaneously too small to sufficiently spread fixed costs, but large enough that the costs of using a third party-vendor are substantial. Unlike the larger producers, moderate-sized herds may not be large enough to have negotiating power to lower costs.

Similarly, in spite of adopting individual identification and analysis software, moderate-sized herd may still be too small to fully capitalize on specialized markets and price premiums in a cost effective manner.

Some alliances are providing post-ranch data back to producers. Ranchers Renaissance, for example, is a cooperative of ranchers, stockers, feeders, processors, and retailers that sells its beef under the Cattleman's Collection, Harris Ranch, and Ranchers' Reserve brands. Ranchers Renaissance has used electronic animal ID since its inception in 1997. The company states that this is the most efficient and economical way to collect data on each animal. This information is then shared with all partners in the production chain. The data collected includes animal source verification, process verification, and genetic verification. However, implementation of a NAIS does not in itself guarantee a flow of information from the processor back to the producer. Participation by all segments in the production chain either through alliances or third parties is required to achieve this connection of data from birth to processing. Thus, again, opportunities for this type of data interchange may not be evenly available based on herd size and likelihood of establishing alliances or costs of third party participation. Even with increased connectivity between different segments of the beef industry, technology in the 5 to 10 year span is unlikely to greatly facilitate information from the post-breaking of the carcass back to the production segments.

Seedstock producers should not find new identification and analysis technology difficult or challenging to implement as they are already individually identifying animals. While there may be marginally higher costs of the technology compared to traditional individual animal identification, increased recordkeeping speed, reduced labor and errors may be benefits that counter-balance costs.

Stocker operators, after a period of time, will start to receive cattle that are already tagged and therefore avoid identification costs.

However, the various sources of purchased cattle can result in the need for different technologies to properly read different tags if there is not compatibility between companies. This issue may require the purchase of several different types of readers. In addition, the frequent movement of stocker cattle may increase bookkeeping costs associated with movement record keeping, even when there is no change of ownership. This will depend on the specific reporting requirements of the NAIS which are currently unresolved. These costs to the stocker will be spread over a relatively small weight gain per head, and thus may be difficult to recover. These constraints may result in greater communication and alliance between cow/calf producers, centralized markets, and other third parties and stockers to standardize technology, with resulting financial rewards through reduced costs and/or premium prices. Similar linkage incentives may exist with the next chain in the production, the feedlots.

Centralized markets may face substantial changes in operation and requirements for methods to rapidly collect, assemble and disseminate individual animal data. However, these markets may also benefit from marketing services to individuals electing to not personally implement the technology.

Summary

Individual animal identification in accordance with the NAIS standards may increase sale value received for cattle due to enhanced prices related to the availability of additional production information about the cattle. Additionally, the availability of improved records may facilitate better on-ranch individual animal management and selection decisions. Costs for implementation and benefits may vary by herd size, with this may create more dilemmas for the medium size producers compared to small or large producers. Individual animal identification and analysis programs may provide improved financial returns for individual cattle producers, depending upon their management ability and commitment to use the information to make improvements.

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Acknowledgements

The authors and University of California Cooperative Extension committee would like to thank the California Department of Agriculture for providing the funds to develop this fact sheet and educational materials for Animal Identification. In addition, the committee appreciates the contributions of the Western Extension Marketing Committee.