A FEEDBACK SYSTEM TO PROMOTE INTEGRATION, SHARING OF INFORMATION AND PROFITABILITY AND SUSTAINABILITY OF ALL BEEF SUPPLY CHAIN SECTORS

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SUMMARY

A joint Beef Industry Supply Chain Systems Project between the Queensland Government and Nolan Meats Pty Ltd was developed to foster improved supply chain relationships between processors and suppliers. The project focus was to take advantage of value adding opportunities and improved efficiencies by implementing an innovative feedback system. An electronic identification system (EID) for source verification, quality assurance, and the collection and transfer of animal performance information was evaluated. Sixty-six producers supplied 1,544 cattle that were individually identified with EID tags at feedlot induction, and their performance traced through to slaughter. Data collected showed that the top 10% of animals made a profit of $68/head compared with the bottom 10% that made a loss of $142/head. Variation in the data collected highlighted the opportunities to improve efficiencies and returns for both the processor and the suppliers. The processor could identify those suppliers with high market compliance cattle. In turn, suppliers received feedback information identifying the type of animals they needed to produce to attract the highest returns. This project demonstrated that better communication and recognition of high performing suppliers will enhance the development of supply chains that will increase the efficiency and competitiveness of the industry.

Keywords: profitability, sustainability, beef, supply chain

INTRODUCTION

A feature of the Australian and some international beef industries has been a fragmented structure, composed of many independent segments, each trying to profit from each other's mistakes (Ritchie *et al*. 1996). Factors impacting significantly on the future of the Australian beef industry include the increasing international competitiveness for beef markets by other countries and other meats (Burns 2000); the prediction that world trade in meat is expected to nearly triple in the next 15 years, with an expected increase in international beef trade of 187% (Delgardo *et al*. 1999); the increasing demands for an ethically and sustainably produced product (J.R. Pillarisetti, *pers.comm*.); and an increasing cost of production, with no predicted increase in real prices for product (Vercoe 2002).

This segmented industry structure has prevented the flow of economic signals that could promote the impetus for the improved management of many traits that are key to ensuring consumer acceptability of the final product. This has hurt the competitive position of beef in the market place. Therefore, to ensure that customer requirements are met, there is a need to develop a system such that economic signals for live animal, carcass and eating quality traits can flow consistently to, and be quickly translated into action by, the different industry segments. The development of a 2-way flow of information, as part of a total beef resource management system, focused on improving the efficiency of each segment, should lead to increased profitability for all parts of the chain (Kinghorn 1999; Burns 2000). Once this system is in place, the development of cooperative structures is more likely to follow. The general lack of vertical integration and Value Based Marketing (VBM) has limited the knowledge of customer needs and reduced the impetus for the adoption of technology. The promotion and development of both vertical and horizontal integration will assist in improved efficiencies and adoption of technology (Ritchie *et al*. 1996).

Central to improving the efficiencies of all beef supply chain sectors is the need for an identification and feedback system to ensure the delivery of animal performance information, source verifications, and trace-back credentials for beef products. This will assist in the development of a VBM System that consistently sends correct market signals to the supply chain, rewarding those producers who produce to market specifications. The European Article Number already exists for tracking carcase and food, and what is now needed is the link to the animal and the transfer of information. Therefore, major attitudinal and structural changes must be implemented by the industry to address the need for a 2-way flow and sharing of information through a national identification system.

Through the Food and Meat Industries Taskforce (FMIT), a Queensland Government initiative, a project was initiated to develop strategies to improve the efficiencies of Queensland beef industry supply chains. The FMIT was a multi-disciplinary, multi-organisational, across government business unit established to work with the Queensland processing industry to improve its efficiency and increase value adding. Supply of cattle of sufficient quality has been regularly identified by the processing industry as a major constraint to efficient production. The processor-driven Beef Industry Supply Chain Systems Project focussed on the promotion and improvement of cooperation between the processor, lot feeder and commercial beef producer. The objectives of the project were to: 1) demonstrate the variation in value of a group of cattle and identify potential areas of improvement; 2) create closer links between the processor and suppliers of cattle by providing extensive performance feedback information and understanding of customer requirements; and 3) demonstrate the use of electronic identification (EID) tags for the provision of feedback. This paper reports the success of delivering on these project objectives.

MATERIALS AND METHODS

Collaborators

Nolans Meat Pty Ltd (Nolans), a family owned processing business based at Gympie, north of Brisbane, is focused on servicing the domestic trade market. Currently, it slaughters and processes approximately 400 cattle/day (about 70,000 cattle/year) and supplies high quality beef products to supermarkets, wholesale outlets and butcher shops in all mainland states of Australia. To ensure a consistent supply of animals that meet specifications, approximately 50,000 cattle are lot fed, either through the company's Wide Bay feedlot or custom fed through 2 other local feedlots. Many of these cattle are sourced from saleyards and 'boxed' on arrival, making linkage of cattle to the breeder impossible. The remaining 20,000 head are supplied by direct consignment. Recently, Nolans has implemented the Meat Standards Australia (MSA) grading scheme and has been successful in increasing market share through the delivery of a high quality product.

Livestock and Equipment

One thousand five hundred and forty-four cattle of both sexes and various breeds were sourced from southern and central Queensland. These cattle had an average liveweight of 285 kg. Purchase prices were $2.10/kg for steers and $2.00/kg for heifers. Two types of commercially available EID tags were used. The hardware used to read the EIDs was commercially available. Nolans' staff developed the software and collected the data. Cattle were slaughtered at the Nolans' abattoir.

Methods

An invitation was sent to Nolans' suppliers in December 2001 to participate in the trial. Sixty-six producers supplied the 1,544 cattle for the trial that began with feedlot induction during the week of 21 January 2002. At induction, each animal was tagged with either 1 of 2 commercially available EID tags and allocated to pens in supplier groups. Cattle were on feed for 70-100 days, with all animals included in the final results, including those outside specifications. Cattle were slaughtered at an average weight of 426 kg. Nolans' staff customised their existing software to record individual animal performance data from the feedlot and slaughter floor, including MSA grading and offal compliance. On 11 May 2002, suppliers were invited to attend a presentation to discuss the performance of their cattle, and the potential for use of the information to improve future animal and carcase performance.

RESULTS

Electronic identification

Initially, the use of EID tags and the new software increased induction time, however, as staff became more familiar with the process, and software problems were addressed, induction times returned to

normal. Problems were encountered with 1 EID product with respect to the electronic reading of tags and attaining effective male-female connection. Subsequently, this product had a high loss rate of approximately 10%. The design has since been altered. The equipment used in the reading and collection of electronic data proved to be very robust with no breakdowns recorded. Accuracy of the read rate of the tags on the slaughter floor was 98%.

Feedlot Results

The performance of the project animals in the feedlot is presented in Table 1. Results are not adjusted for days on feed, but are presented as the animals were slaughtered. Major issues highlighted by the feedlot manager included: 1) number of cattle incorrectly consigned on completed National Vendor Declarations; 2) number of cattle delivered out of specifications; and 3) cattle sourced directly from a property came onto feed much better than saleyard cattle.

Table 1. Summary of results of the performance of cattle in the feedlot.

Trait	Average	Standard deviation
Entry Weight (kg)	285	43
Daily Weight Gain (kg/d)	1.7	0.38
Entry cost ($)	584	89
Exit weight (kg)	429	58
HSCW (kg)	230	38.7
Feedlot Weight Gain (kg)	144	33
Exit Weight (kg)	429	58
No. Days on Feed	86	6
Final $ value	744	127
Profit $	-33	72

Abattoir Results

The final results and the variation for the whole group of cattle are also presented in Table 1. There was a considerable drop in market price from the time of offer to time of slaughter and, on average, the group lost $33/head.

This project also identified opportunities for improving cattle health, overall performance and increased returns by reducing damage to various organs. Specifically, offal condemnation rates of 10% for livers, 5% for kidneys, 6% for skirts (thick and thin) and 1% for hearts resulted in weight losses of 1500, 68, 42 and 19 kg, respectively.

Price

The Eastern Young Cattle Indicator declined from 345 cents/cwt at the offer time, to 339 cents/cwt at the time of delivery, to 318 cents/cwt at the time of slaughter (a decline of 8%). This decline in price had a negative effect on the financial return of the exercise. In addition, it demonstrated to suppliers the financial risk that meat processing businesses can be exposed to from market price variations.

Feedback Day

One hundred and seven producers comprising the 66 suppliers of the trial cattle attended the Feedback Day on May 2002. On this occasion, the various forms of feedback information were explained and opportunities for improvement identified. Nolans now has an established EID system in place between their feedlot and abattoir, as standard practice, to enable identification of problems and opportunities, for example, preferred suppliers of cattle.

DISCUSSION

Access to animal feedback information allows producers to assess how well their production systems are complying with customer requirements. This feedback highlights areas that require attention if the producer wishes to continue to supply to this market. Improvements in performance will maximise the value of producers' animals, resulting in greater returns through a VBM system, and ongoing demand from the processor. Correct interpretation of this feedback information is required in relation to the producers' breeding objectives and management practices. It is paramount that an animal's history is also recorded and considered during any decision making process. This history would identify checks in growth performance due to sickness, poor nutrition as a weaner, or poor temperament. It would also indicate improved performance due to compensatory gain or genetic superiority. For example, 1 supplier's data selected at random demonstrated the large variability in performance that occurs in

many herds. The variation in profit from the bottom 10% ($-98.92) to the top 10% ($53.96) highlights improvement opportunities. Data evaluation for this supplier highlighted areas having the most impact on profit. In this case, they were: 1) growth rate in the feedlot (1.99 kg/day *v.* 1.4 kg/day); 2) carcase weight at slaughter (264 kg *v.* 207 kg); 3) carcase pH (implying issues with temperament); and 4) ossification (suggesting animals may have been sick or on poor nutrition prior to feedlot entry).

Nolans has made feedlot and abattoir performance data available to their suppliers. However, very few have requested this information despite Nolans clear intention at the outset to target those cattle that are more profitable. As a result, producers have waived an opportunity to use this information to negotiate higher returns for their product. We believe that the processors involved in this project recognise the variation in lines of cattle, and inefficiencies of price averaging. These companies have seen the need to provide information and price incentives to suppliers to help them identify this variation and increase compliance rates. To overcome this issue, closer communication between the processors and supplier is needed to promote the benefits to all sectors.

The ability to electronically access well-formatted information, and to utilise computer software to evaluate the data, will simplify assessment of feedback information in the future. Feedback in traditional paper format often creates confusion, misinterpretation and difficulty in analysis and is, therefore, often not used. For example, BREEDPLAN genetic performance information could be accessed to identify and select bulls that will improve identified weaknesses in the areas of reproduction, growth and carcase traits.

The National Livestock Identification System (NLIS) is being evaluated in Australia as a means by which industry may meet the demands of the production, processing and consumer sectors for traceability, food safety, and eating quality information to remain globally competitive. In addition, it will also play a major role in limiting the impact of disease outbreaks. Further, NLIS has the potential to enable the electronic feedback of performance information to seed-stock and commercial producers, many of whom have been isolated from customer requirement information through the traditional saleyard system. This information, used in combination with improved property recording, will result in more informed management decisions. Critical components of this strategy will be the software utilised to interpret the data, and the desire of the producer to use it in day to day management.

Finally, without an effective feedback system, commercial producers continue to find it difficult to develop effective breeding objectives and management programs to improve the value of their product. In addition to a disease management function, NLIS has the potential to provide effective feedback. This could improve Australian beef industry supply chain efficiencies by providing processors with cattle having high compliance rates to customer requirements, and competitive margins for all supply chain sector participants. Processors are aware of the inefficiencies, and some are taking steps through increased communication to encourage supplier changes. Therefore, an effective feedback system, potentially utilising NLIS, needs to become an integral component of a total beef resource management system strategy.

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