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Tracking of Animals from Birth to Beef: Implications for Genetic Evaluation, Quality Assurance, Animal Traceback and Information Access

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Background

Beef cattle production in Canada involves several segments of the industry: seedstock producers, commercial cow-calf producers, feeders, sale barns and packing plants. Traditionally, the industry has had little in the way of market signals from the packer back through to the seedstock level. The focus of genetic improvement programs has been from the seedstock and cow-calf sectors but the economic incentive and market signals have not been connected to the traits these producers measure. Traditional genetic improvement has focused on growth and maternal traits, but more recently industry interest has increased in the area of carcass traits. By developing data collection and genetic evaluation systems that measure and evaluate traits "in "birth to beef", the traits for genetic improvement and the marketplace economic signals can become one in the same. To be complete this data collection system must include calf performance traits, growth and feed efficiency measures and carcass and meat quality traits.

The Canadian beef industry has a big challenge to meet increasingly diverse consumer demands while continuing to produce high quality and safe beef. There is increased public awareness and concern over food safety (eg: UK and Europe BSE outbreak, Hepatitis A linked to imported strawberries, Hudson Foods and E. coli 0157:H7, etc). Typically, cattle change ownership 3 to 4 times from birth to beef. Food safety guarantees are becoming a major factor in marketing assurance. In order to fully implement the principles of Hazard Analysis Critical Control Points (HACCP) and quality assurance programs, a national identification system to identify and track animals through all parts of the production system is essential. Individual animal identification enables us to brand our product and stand behind it.

Due to increased interest in food safety issues, with the BSE scare acting as an extra catalyst, the Canadian Cattlemen's Association (CCA) has *created* a working group to design a national beef cattle identification and animal traceback system. This process of implementing a quality assurance program from birth. to beef has already begun at the packer and feeder levels with a goal to establish HACCP quality assurance procedures in producing, transporting, marketing, processing and distributing sectors to ensure a safe and healthy product.

At the same time, in order to make effective breeding decisions and manage health and nutrition to produce a more wholesome beef product, an effective animal traceback system must allow for the transfer of information on individual animals from sector to sector yet at the same time maintain a fine balance to ensure that information confidentiality remains intact.

BIO's Birth to Beef Information System

BIO's birth to beef information system, known as BIO-LINK, was started as a pilot project in 1994. The primary goal was to develop a complete, electronic based information system that connected all sectors of the beef production chain from seedstock and commercial cow-calf producers to retained owners, feedlot operators and packers.

BIO-LINK currently operates as a full service and is used across various sectors of the beef industry -from pure-bred breeders, commercial cow-calf producers, retained owners to backgrounders, feedlot operators and four different packing plants.

This complete birth to beef collection system also ties in with herd recording and central bull evaluation information. Pre-weaning and post-weaning information include birth weight, calving ease, weaning gain and yearling gain. Sires evaluated on the Bull Evaluation Program have information collected for gain on test, individual feed efficiency, average daily gain, height, scrotal circumference, along with real time ultrasound measurements of backfat depth, rib eye area, and percent intramuscular fat. This bull **e**valuation performance data combines well with BIO-LINK data in a performance and progeny test design.

Feedlot information collected through BIO-LINK includes feedlot arrival date, shipping weight, days on feed, average daily gain in feedlot, carcass weight per day of age (for retained owners), and days to market. Health information is optional but data can be collected on feeding programs, implants and additives used, vaccinations and additional management information. Carcass data that are collected include hot carcass weight estimated yield percent, yield class and grade. Rib eye area and fat cover are optional carcass In order for an identification system to be readily accepted by all sectors of the beef industry, the system needs to be accurate, low-cost and easily administered. Individual animals were initially tracked using the radio frequency identification tags (RFID). Although the system works very well, the high purchase, recycling and handling costs for the tags limited the expandability of the B1O-LINK service. Animals are now individually tracked using laser printed bar code tag technology.

BIO operates a central database with information provided from the various beef sectors. All parentage, herd, feedlot and carcass data on cattle are combined as well as weekly prices, grading averages and calculated information such as feedlot average daily gain and carcass weight per day of age. BIO manages and stores the information but does not own it. Individual animal information is co-owned by the breeder, feeder and packing plant. By tracking ownership information along with data on the cattle, BIO can maintain a list of owners who are eligible to receive information on each animal. A database is maintained that matches original ownership of tags as well as the owner of the cattle as they arrive at the packing plant. Information received from each packing plant is individually coded so the origin of the carcass information is always known. Validation is done to ensure a person requesting reports or information on a specific animal owned that animal at some point in the production chain.

Advantages for Best Beef Industry

BIO-LINK provides the mechanism to identify animals all the way through the production chain back to the her of origin. Various opportunities that can be provided through BIO-LINK ARE as follows:

Information to identify sires with superior genetics for meat quality characteristics and increased feed efficiency.

Information to direct breeding programs to meet customers' changing needs .

Information to demonstrate superior feed lot performance and health management.

Ability to identify preferred suppliers with cattle with superior meat quality characteristics.

Ability to customise purchasing program to a specific marketing program (such as niche markets).

Information to enhance quality control and assurance programs, resulting in an improved image to customers.

Identify calves for a branded beef product line.

Information to reduce costs by avoiding duplicate management and health practices.

Ability to incorporate computer visioning system technology, once available, for individual animal value assessment and then relay this information back to suppliers.

Ultimately, the combination of growth traits with real time ultrasound and actual carcass measurements will result in comprehensive genetic evaluations for carcass traits. Armed with more birth to beef information, breeders can make better informed breeding decisions and use this for increased marketing opportunities (such as marketing bulls overseas).

Individual tracking is invaluable for quality assurance. Successful marketing of Canadian cattle will become more and more dependent on the ability to track animals. The main purpose of an effective trace back system is to preserve the beef export and domestic markets. The success of animal trace back, quality assurance and genetic evaluations are all dependent on access to information. Success can only result if information is linked from sector to sector.

Tracking information on animals from birth to beef is being done successfully by BIO. This system operates as a full service to pure-bred breeders, commercial cow-calf producers, backgrounders, feedlot operators and packing plants. Data is collected on pure-bred and commercial cattle under commercial conditions. BIO 's

birth to beef information tracking policy on information access is as follows: " *Any person involved in the breeding and/or feeding of an animal will have access to parentage, herd performance, health, feedlot and carcass information on that animal"*. With industry co-operation, it is possible for information to flow successfully from sector to sector in a form of vertical integration of information. Much of the co-operation hinges on the fact that individual animal information in co-owned by the breeder, feeder and packing plant. The solid support of users of the BIO-LINK service for vertical information integration is backed by their belief that access to all information on an animal benefits their enterprise while at the same time they are secure in knowing that their competitor can not access that information.

Successful tracking of animals from birth to beef will result in improved efficiencies and reduction of costs which will ultimately position the beef industry to compete more effectively with the pork and poultry industries and take advantage of a huge market opportunity.