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“Quality Assurance “Down Under”: Market Access and Product Differentiation”

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Executive Summary

Australia and New Zealand are major beef producing countries and major beef exporters. Unlike the case in the United States, where less than 10 percent of beef is exported, approximately 60 percent of Australia's and 85 percent of New Zealand's beef production is exported. Because of their dependency on a diverse set of export customers, these two countries are developing quality assurance programs that differentiate their beef in the global market and assure individual customers that the product is safe and meets customer needs. The Australian government and beef industry have invested in innovative identification, grading, and quality assurance systems that can be used by processors, producers, and supply chains. New Zealand relies upon individual processors to develop and implement quality assurance programs with their producers and suppliers. Using these innovations, supply chains have been able to distance themselves from the commodity market.

Key words: beef, quality assurance, traceability, value-added.

Quality Assurance “Down Under”: Market Access and Product Differentiation

In November 2001, a team from Iowa State University traveled to Australia and New Zealand to study the countries' quality assurance systems in beef production and marketing. Along with Canada, the two countries supply over 80 percent of U.S. beef imports. Perhaps more importantly, Australia is a major U.S. export competitor in Japan and other Asian markets. The beef sectors in these countries depend on exports; their industries have taken strides to secure access to world markets. Although within these two countries the approaches to quality assurance systems, traceability, and product differentiation vary, they are far more commonplace than are those seen in the United States. In addition, the beef processing sectors in Australia and New Zealand operate on a much smaller scale than does that in the United States. Why has their industry evolved as it has? Are there things that can be learned and applied to the U.S. market? Australia and New Zealand are significant beef producing countries and major beef exporters. Australia exports approximately two-thirds of its supply while nearly 85 percent of New Zealand beef is sold overseas. Together they supply approximately half of the beef imported to the United States, which is a major market for both countries. This translates into approximately 30 percent of Australia's beef production and 40 percent of New Zealand's total beef production. Thus, U.S. consumers eat as much or more Australian and New Zealand beef as do the countries' own consumers. In recent years, Japan has imported about the same amount of beef from the United States as it does from Australia. Both Australia and New Zealand also export to Europe, which has high expectations for quality assurance and trace-back of meat products. Although they follow different tracks to meet customers' export demands, both countries are pursuing innovative quality assurance (QA) and market access programs.

In an effort to move away from the commodity market, processors and producers within each country are also differentiating their products from other domestic products, as well as from those of global competitors. Australia has taken an industry approach by investing producer “checkoff” funds and processor contributions to develop tools and make them available to all Australian supply chains. These tools include the National Livestock Identification Scheme (NLIS), Meat Standard Australia (MSA) grading, and the Cattle Care QA program. New Zealand virtually eliminated government subsidies to agriculture in the mid-1980s and has since taken a more individual approach to production and marketing. New Zealand now encourages individual firms to develop their own QA systems to address market demands. Because the QA programs are unique to the processor and some switching costs are involved, New Zealand producers are loyal to their chosen processor.

The following is a brief overview of the beef sector and QA programs in Australia and New Zealand. I discuss the two programs observed in the two countries, comparing and contrasting them with each other and, when appropriate, with such systems in the United States. Then, I give examples of how producers and/or processors are implementing QA and/or innovative marketing systems to differentiate their products and to improve their competitive position in the global beef market.

The Australian Beef Industry

Australia had 18,000 specialized beef producers (with at least 50 percent of farm income from beef) in 2000 and an additional 20,000 non-specialized herd producers. The 1999 cattle inventory was 26.6 million total cattle, with 11.6 million head of beef cows. There is an approximately 800,000 head capacity in feedlots, as the majority of beef slaughter in Australia is grass fed rather than grain fed. Annual cattle slaughter was 7.5 million head in 2000. Approximately one-third of the beef produced is consumed domestically and two-thirds is exported (30 percent to the United States, 30 percent to Japan, and the remainder to other countries). Most of the cattle herd is on diversified grain livestock farms in the southeast quadrant of the country. In general, Australian agricultural production systems are quite flexible; it is possible to change the enterprise mix by 30 percent in two years as market conditions change.

The bulk of Australia's beef production is for the commodity market. There are small niche markets, which are growing quickly but from a small base. Only 20 to 25 percent of the cattle slaughter is grain fed, with the remainder being grass fed. Grass-fed slaughter cattle have a range of weights (660-1,220 lbs) and are seasonal, depending on pasture conditions. During the dry season, producers may bring cull cows, two- to three-year-old steers and heifers, and calves less than a year old to market on the same day. Much of the beef exported to the United States is grass-fed manufacturing beef (95 percent chemical lean). The beef product destined for Japan is produced with supplemental grain feeding and some long-term grain feeding (150-270 days on feed). The length of time on a high-concentrate diet is documented through the Australian Lot Feeders Accreditation program to assure buyers of the extent of grain feeding. An ear tag noting the week of placement must be attached to the beef animal when it is slaughtered in order for it to be sold to Japan as grain-fed beef. By comparison, the U.S. cattle inventory in 2000 was over 97 million head with 33.4 million beef cows. There are more than a million farms with cattle, feedlot capacity exceeds 11 million head, and nearly all steers and heifers (not kept for breeding) that are slaughtered are grain fed. The United States consumes over 90 percent of its beef and exports approximately 9 percent, with half of the exports going to Japan.

Major changes in the Australian beef sector began in the mid-1980s. Historically, many cities and towns had municipally owned packing plants; however, as plants needed upgrading and capital investments, cities sold their plants to private companies. With this re-investment, economies of scale came into play, unions began to lose power, and multinational companies began to buy, remodel, or build new plants. Larger plants began to pressure smaller, older, higher-wage-rate plants. The largest plant currently processes 3,200 head/day and is owned by Australian Meat Holdings, a division of Conagra. Cargill owns a plant at Tamworth (700 head/day-one shift), which is considered a "good-sized, efficient plant." Both companies own other plants as well, which has raised concern that the pattern of concentration in Australia's beef processing sector may follow that of the United States. Of greater concern to many industry observers is that two grocery retailers (Woolworths and Coles) have an 80 percent market share in Australia.

New Zealand Beef Industry

New Zealand has a land area approximately 1.8 times the size of Iowa, with 3.8 million people. The beef industry in New Zealand is much smaller than that of either Australia or the United

States. In 2000, New Zealand had approximately 9.0 million cattle of which 4.7 million head were beef animals and 1.5 million were beef cows. Approximately one-third of the beef produced is from dairy-breed bulls raised for slaughter at approximately 1,100-1,300 pounds. Another one-third of the beef is from cull dairy and beef cows. Because little grain is raised or imported, essentially all cattle slaughtered are grass fed in intensive grazing systems. Beef exported to the United States is extremely lean manufacturing beef for grinding and is used primarily in the fast food industry.

In general, New Zealand beef processing facilities are smaller than U.S. plants. There are 29 plants approved for beef exports, many of which process both beef and lamb. Two of the four largest processing companies are cooperatives, one of which owns a controlling interest in the largest privately held processor. These larger companies own multiple plants and generally have larger-than-average plants.

In 1984–85, New Zealand greatly reduced government support of agriculture. This country of 3.8 million people is heavily dependent on exports and focuses on animal product exports, such as lamb, wool, and dairy, rather than on the export of raw products, such as grain. As a market-oriented country, New Zealand exports 95 percent of its lamb, wool, and dairy, and 85 percent of its beef production. New Zealand plants are inspected by and certified to standards set by each importing country and are often inspected by individual companies to which they sell.

Value-Added Information Systems:

Traceability, Precision Grading, and Quality Assurance

With a few notable exceptions, the Beef Quality Assurance (BQA) program in the United States is a voluntary educational program. BQA, administered by the National Cattlemen’s Beef Association, focuses on best management practices for injection sites and pharmaceutical use. In the United States, branding of beef products or differentiation by grade (Select, Choice, or Prime) is determined by a U.S. Department of Agriculture (USDA) employee at the plant. To qualify for some programs, for example, Certified Angus Beef, Certified Hereford Beef, or other breed-specific programs, the live cattle have to express specified visual characteristics and then meet the USDA grading standards. Such programs generally place little or no requirement on the production process, seldom require BQA, and do not require documentation. The carcass is accepted or rejected based on characteristics evaluated post harvest by a third party (USDA grader), who sorts commodity beef into various outcome groups that can be merchandised to wholesale or retail buyers. In recent years, producers have received premiums or discounts depending on how their cattle were graded (i.e., the percentage of cattle achieving a higher USDA quality or yield grade). Producers typically can get carcass (and premium and discount) data on a lot basis from the packer if they sell cattle on a value-based system. If producers want to trace the measurement and value to an individual animal, they generally have to pay a data collection fee.

Much of the beef produced in Australia and New Zealand is commodity beef—in many cases, manufacturing beef destined for hamburger. However, in striving to break out of the commodity market, supply chains typically provide more information about their products and strive to improve the quality of their products. While U.S. producers think of quality in terms of USDA grades (Prime, Choice, Select), Australian and New Zealand supply chains strive to meet the

mark of quality as defined by their customers. The following programs are examples of how the beef industry or individual supply chains in Australia and New Zealand are implementing product differentiation.

Traceability and Information

In Australia, the voluntary QA system is led by national governmental agencies and a single industry entity, Meat and Livestock Australia (MLA). In contrast, at this point, New Zealand's program is strictly voluntary and is led primarily by processors based on private entity participation. For this reason, it appears that implementation of some of the component parts of the system may be moving at a slower pace than is the case in Australia. The purpose of these systems is to enhance Australian and New Zealand beef products in terms of integrity and value to the end user, or customer.

In Australia, the industry voluntary QA objectives are clearly identified:

- Demonstration of food safety along with a DNA sampling protocol for trace considerations
- Long shelf life
- Proof of quality for export through a national identification system
- Determination of customer preferences

Control systems in place in Australia consist of a quality protocol called Cattle Care, used for management in conjunction with the Australian Quality Inspection System (AQIS), and for control of exports to ensure food safety. Cattle Care is a modular series of packages that deals with all facets of production, handling, and processing. The series has been modified to include systems for other livestock, such as lamb and veal, and a modification for grains is under consideration.

New Zealand is creating a system that will contain many of the same elements as Australia's Cattle Care but with participation on a processor-by-processor basis, as it appears the system is in an earlier stage. This factor may explain the differences noted between the two countries. With some federal research support, the Australian industry has invested in infrastructure to improve information flow through the supply chain. In general, there is greater information passing from the producer to the packer than is commonly the case in the United States. The producer must complete and sign a National Vendor Declaration form with each lot of cattle sold. This standard form carries a unique number and is signed by the seller or the person responsible for the husbandry of the cattle. When the cattle are sold at auction, the sales agent must provide information on the Stock Agent Company and the buyer and must maintain a copy of the form for a minimum of two years. Information on the Vendor Declaration includes the following:

- Seller name, address, phone, and Property Identification Code (PIC), a unique farm identification number assigned by the government
- Description of the lot (number by sex, if they are in the NLIS, and travel permit number)
- Whether the cattle have been treated with a growth-promoting hormone
- Verification of whether the cattle are part of an independently audited quality assurance program

- Whether the cattle were bred on the property, and if not, how long they have been at the PIC
- Information about the feeding program (by-product feeds, sprayed pastures, withdrawals)

From this information, the buyer knows if the animal is eligible for special programs, if there are particular risks, and who is the individual responsible for the animal. The seller signs a form assuming responsibility for each lot of cattle and verifying the accuracy of information as represented. From this information and the "tail tag" or other formally recognized identification, the cattle can be traced to the seller's farm if problems arise.

The industry organization, MLA, has developed and operates the NLIS, which uses radio-frequency identification tags and a single national database to provide trace-back. NLIS is a voluntary, real-time, on-line system of individual identification of animals. NLIS had 3.2 million head of cattle entered in its first two years, starting in December 1999. Demand for the program is driven by the European Union, which would not renew Australia's ability to export to its member nations without a trace-back system in place. Currently, individual identification is mandatory in Victoria, and beginning in July of 2002, feedlots, which feed 25 percent of slaughter cattle, will require electronic tags for incoming feeder cattle. In late October of 2001, Japan announced a mandatory identification system for all of their cattle. If Japan requires a comparable system for imported beef, Australia has the infrastructure in place because they developed one to assure market access in the European Union.

Because the focus of NLIS is on food safety and trace-back, only four data points are required and accepted: tag number, selling farm PIC, buying farm PIC, and date of transfer. Farmers order tags through local government offices, and the tag company makes the tags and sends tag information (tag number and selling farm PIC) to the NLIS. The buyer must enter data when cattle are sold; the seller does not have to have equipment or even record the data. The cost of tags varies by state but ranges from AU\$2.80 to \$3.80 per tag (approximately U.S.\$1.40 to \$1.90). A farmer or alliance may choose to record and monitor additional data in a separate database using the same tag, but NLIS uses only the four data points. Private sector companies are emerging to provide management software using the same tag. Lenders are accepting tags as proof of existence and ownership and are providing greater access to credit and lower rates (12 percent with tags compared with 16 percent without).

The Meat Standards Australia Grading System

The MSA grading system is a voluntary program that was developed as a cooperative effort between government and industry with university research support. MSA grading uses a series of objective pre-harvest and post-harvest measures or interventions to predict eating satisfaction (tenderness, juiciness, flavor) for primal or sub-primal cuts rather than for the whole carcass. The research utilized taste panel data from 19,000 consumers sampling 10 pieces of meat each for a total of 190,000 observations. Variables that have been found to affect eating satisfaction include genetics, age of animal, amount of grain feeding, meat color, fat color, and marbling. Interventions that improve eating satisfaction include electrical stimulation of the carcass, "tender-stretch" (hanging the carcass by the tendon in the rump rather than the hock) for 12 hours, aging of the beef 14 to 21 days, or method of cooking.

To qualify for an MSA grade, the cut has to score a three-, four-, or five-star grade on a five-star scale. Because the grading system is on a primal basis, it is possible that cuts from the same carcass may have different grades and that a cut could improve in grade based on intervention, aging, or cooking. For example, a flank steak may never exceed three-star and that grade is achieved only under certain cooking methods. A filet from the same carcass may start as a three-star but upgrade to a four-star after 21 days of aging. The USDA grading system establishes a grade for the entire carcass after it has chilled 24 hours.

Packers, retailers, and restaurants that use the MSA system and display the MSA symbol and “guaranteed tender” promise must be audited to assure they are following procedures. Furthermore, the MSA grading provides a trace-back system on an “as needed” basis. Processing plant employees take blood samples for DNA analysis from each carcass while it is still identified for the seller. These samples are bar-coded and packaged for later retrieval if required. If a customer requests a refund because of a bad experience, a tissue sample from the meat is taken for a DNA match. The product is traced back through the supply chain to identify if the problem resulted from some improper action in the chain (improper cooking or aging, malfunction at the plant, or misinformation from the seller). The cost of running a trace on a cut is AUS\$30-\$40, but only the offending cuts are traced back.

Examples of branded beef programs that are using the MSA system include the following: Certified Australian Angus Beef (CAAB)—similar to the Certified Angus Beef (CAB) program in the United States. The Australian Angus Association controls the CAAB program. In addition to MSA grading, participants must show lineage to a sire registered in the Angus herd-book. In the United States, cattle need only to have a black hide and grade in the upper two-thirds of Choice to qualify, thus dismissing the need for preharvest information.

Nolan Meats—a family-owned meat company with a new, small packing plant and a vertically integrated feedlot to supply approximately one-half of its cattle needs. Nolan’s plant is ISO 9002 certified and uses MSA grading to differentiate its beef from that of large processors like Australia Meat Holdings (Conagra) in the domestic market. The Nolan plant is not inspected for exports and thus relies completely on the domestic market.

Hereford Prime—a coop to promote beef from Hereford sired cattle, it entered the retail meat business in 1998. Cattle are Hereford or Hereford crosses that have not been pen or lot fed and have not received a growth-promoting hormone. MSA grading provides trace-back and information flow on the meat. In addition to meat premiums, the hides are individually graded, and premiums and discounts are paid to producers.

Cha-Cha-Char—a five-star restaurant along the waterfront in Brisbane. Its beef entrées all carry the MSA symbol even though they appear to come from different regions of the country. Each entrée has a brief story about where it originated. The menu also describes in detail the MSA grading system and how that affects the eating experience.

Australian Quality Assurance Systems

Australia has different QA programs requiring different levels of documentation depending on the market need. One commonality is that industry and government are involved and sanction the program. An example is the Australian Lot Feeder’s Accreditation program, a significant ele-

ment of the overall program. While grain-fed cattle product comprises a fraction of total production, it represents the highest value outcome and appears to be a growing activity for beef output, especially for export. Because grain feeding is not the norm in Australia, Japanese customers wanted some way to quantify the term "grain fed." Accredited feedlots document the feeding process and record the "induction" or placement week on the animals' ear tags. At slaughter, the packer can quickly tell the number of days the cattle have been on feed and market them into the appropriate grain-fed market (120, 150, 180, 210, or up to 300 days on feed). Grain-fed cattle for the Japanese market are reported separately in the monthly cattle-on-feed reports. Although the cattle may not go to Japan, because of the extra documentation required for exports to Japan, feedlots have to decide which market they are targeting when the cattle are placed on feed. Cattle Care is a program of quality assurance, which began in August 1994. It is administered by AusMeat, an Australian producer-packer consortium. On several occasions during the 1980s, organochlorine residues appeared in the meat. The Australian meat industry commissioned a Swiss firm, Society General Surveillance, to examine ways to ameliorate the quality control issues in Australian beef. The firm recommended implementing an on-farm ISO system. Using the concepts of ISO (International Organization of Standardization), Codex Alimentarius, and HACCP (Hazard Analysis Critical Control Point), a group of ten professionals in Australia created an ISO auditable system. Representation on the advisory committee is comprised of 50 percent industry and 50 percent Australian meat customers. This advisory committee convened and reviewed the preliminary program called Cattle Care. Since the inception of Cattle Care, the board convenes periodically to change aspects of the system to either meet customer demands or to provide pragmatic modifications for on-farm use. The result is a system with a document notebook entitled, "Cattle Care." In Australia, approximately 25 percent of all the herds, ranging in size from 8 to 64,000 cows, are under the Cattle Care quality system. In similar ISO programs, more than 900 sheep farms are covered under Flock Care and almost 100 percent of the dairy farms participate in Dairy Care.

The system has been expanded to include other species and crop farm usage. Inasmuch as many of the principles of quality management are the same regardless of cropping systems or species, a core set of quality tenants are outlined and then specie or farm-specific practices are outlined from the core set. To qualify under the Cattle Care scheme, a farm must have two initial audits in year one and then an audit every 12 months in subsequent years. While participants are qualified, they are not certified to ISO 9000. At the end of early field trials, it was determined that this would be more expensive for the individual producer than benefits would warrant. Auditors compete for the farmers' business and the cost of the audits usually runs U.S.\$300 to \$400 every year. Ninety percent of the auditors have farm backgrounds. The AusMeat group audits the auditors, which ensures that audit standards for Cattle Care, and for other programs administered by AusMeat, are being maintained. AusMeat officials are examining environmental, occupational, and health and safety issues. They are planning to develop targets and benchmarks by which producers can measure their operations with others. An Australian national board, comprised of 50 percent industry and 50 percent customer group representatives, oversees the Cattle Care Scheme with yearly reviews. It is interesting that consumer input has such a strong role in this review of the process.

Cattle Care meets the ISO 9000 requirement that products be identified and traced to the degree necessary to maintain product integrity using existing infrastructure. For example, Australia has

established the NLIS. This requires a unique animal identification number, which is traceable from the producer through any step in the system. The identification is keyed back to property transfer. This is an important feature because retrieval of the relevant data and documents validate animal ownership changes. In addition, various systems, ranging from an inexpensive tail tag system initiated some years ago for disease management to radio frequency identification (RFID) tags with serial number coding, are currently in use. More sophisticated systems are still in developmental stages, with many of the same problems as those in U.S. systems. Another feature is that cattle are washed before entering the processing kill floor, a system not unique to Cattle Care but consistent with that of QA. It is believed that this aids in keeping bacteria from entering the plant. As well, wet cattle do not throw off dander, dust, or other particles into the plant air. This could be a significant component of the extended shelf life (120 days or more) claimed by Australian processors. U.S. plants typically do not wash cattle, but use acidic acid washes or steam pasteurization of the carcass to reduce bacterial counts and extend shelf life. At this time, the only systems in the United States that are analogous to what was observed in Australia are Future Beef of Colorado, and PM Beef of Kansas City. These systems focus much more directly on customer issues and reinforcing supply chain considerations with pricing signals. U.S. Premium Beef of Kansas City also contains elements such as those observed in Australia but does not require documentation protocols, nor does it conduct audits, a central part of Australian practices.

To a degree, the value of using a quality management system to gain competitive advantage in a specific industry depends on the amount of differentiation that is possible among players in terms of perceived product quality and peripheral issues such as product integrity. In mature industries such as processed meat, even a small differentiation can be enough to provide a competing organization with a decided advantage.

New Zealand Quality Assurance

Unlike the Australian model of industry and government cooperating to develop infrastructure or conduct research, the New Zealand meat sector appears to be fragmented into individual firms. Government inspectors inspect plants to assure safety and wholesomeness but do not appear to be heavily involved in program development or research. Individual processing firms develop their own QA programs to meet the needs and requests of their customers. If they have customers from both the United States and Europe, they have the required programs for each to assure themselves access to both markets. Participants in the New Zealand meat industry have just voted to require identification for traceability purposes in the beef and venison categories. A pending study of how to achieve that goal economically, and a requirement to similarly identify sheep because of their much greater numbers, has been delayed.

The New Zealand meat industry has many small beef or beef/lamb processing plants, but four firms, two of which are cooperatives, are dominant. Richmond Ltd. is a stockholder-owned company that started as a meat export company and is now one of the four largest meat processors in New Zealand and the largest beef processor in the country. Yet, despite its size, the company has an interesting relationship with producers. The chairman of the board of directors is a producer of sheep and cattle. Sam Robinson, whose farm we visited, markets approximately 9,000 lambs and 750 bulls to Richmond. As chairman of the board, he is directly involved in developing and implementing company policy.

Already into its third year, Richmond Farm Assurance program is a private QA system managed by Richmond. Producers who are part of the system receive a small premium if their product is sold to Richmond. Independent auditors audit the Richmond Farm Assurance program, and the cost of the audit, NZ\$300 per farm, is paid for by the Richmond Company. Initially the audits are conducted every six months; after two successful audits, they are conducted annually. In addition to the Farm Assurance Program, there are audits that are conducted by Richmond’s large customers. For instance, Marx and Spencer from the United Kingdom and McDonalds and Burger King all recently conducted both plant and on-farm audits. Richmond is developing the “Green Tick,” program, which will include environmental standards audited to ISO 14000 standards and will be incorporated into the existing QA program.

Transparency in Transactions and Information

A lack of trust among vertically related members of the supply chain is one of the underlying challenges in a commodity system. This is particularly true at the producer–packer exchange. Producers, packers, and agency people in Australia and New Zealand discussed this challenge, and through improved communication, greater transparency, and formal relationships, we saw evidence of attempts to minimize this hurdle.

An example of greater transparency was the viewing room at the Cargill plant at Tamworth. The facility had recently undergone extensive remodeling, and a large glass-walled viewing room is now included on the kill floor. Producers enter from the outside and watch their cattle being harvested, weighed, and graded using a visual scanning instrument. A computer monitor linked to a visual scanning machine is in the viewing room for producers to observe as it makes its initial muscle grade reading. For each carcass half, the image, carcass weight, and rump fat are displayed on the monitor. While producers can watch their cattle being processed if they desire, it appears that the viewing room is more for education and communication with cattle producers than for process monitoring.

Another example of transparency is the carcass tagging systems in the plants we visited. Immediately after the hide is removed, each carcass receives two tags per side (front and rear quarter). The tag has a bar code and printed information with the harvesting date, body number, side weight, rump fat, age of animal, whether grain or grass fed, Bos Indicus percentage, vendor property identification code, and town or region where the cattle originated. One plant retains similar information with the hide because, as hides are graded and individually valued, producers receive a premium or discount for the hide as well as for the carcass. In some cases (for Hereford Prime in particular), grading information including hide values is reported to producers. While U.S. plants may maintain similar information on cattle, it is not as obvious on the carcass in the cooler. In most U.S. plants, a cooler tag will show the body number, side weight, and date. Although more complex than the USDA grading system, the MSA grading system provides more information to the buyer and seller and places greater emphasis on eating satisfaction. The MSA grade also provides a “guaranteed tender” promise to consumers and an auditable trail to identify and correct problems that may occur. It explicitly recognizes the variables throughout the supply chain (production, processing, and cooking) that affect the eating experience.

Examples of Value-Added Beef Supply Chains

Hereford Prime, headquartered at Casino, New South Wales, has been in existence for about 10 years. The business promotes beef from Hereford sired cattle; however, it did not enter the retail meat business until June of 1998, when Hereford Prime bought Lee Pratt, an existing meat company. Hereford Prime is a co-op of 664 shareholders. Shares cost \$1 each and were sold in a block of 250 shares. The shareholders do not earn capital gains. If they quit, they can get their \$250 back. Hereford Prime cattle are Hereford or Hereford cross cattle that have not been pen or lot fed (grass-fed only) and have not received growth-promoting hormones. The beef is MSA graded, which provides trace-back. The hides are also graded and individually priced, with premiums and discounts paid to producers. Hereford Prime sells three brands: Hereford Prime, Lee Pratt (non-Hereford but similar MSA grades), and Hereford Premium. The Hereford Premium brand is sold in the United States (two container loads per month to a distributor in Philadelphia). The company is promoting a “clean and green” grass-fed product from Australia. Hereford Prime processes its cattle at the Northern Livestock Cooperative at Casino. The co-op was founded in 1935 and built the existing plant in 1959. The plant is currently a custom kill and process facility and prepares product for 20 different small brands or alliances. The plant has a capacity of 2,500 head per day, half calves and half cattle. Their cost for slaughter and processing through to boxed beef is approximately AUS\$140-\$150 per head. The hide and offal credit gets the net cost back to approximately AUS\$60 per head. The hides are identified individually and graded, and premiums or discounts are paid to the producer. Producers selling to Hereford Prime receive full MSA carcass data and hide score information on each animal.

OBE Beef is an organic beef producer alliance. There are about 20 producers whose beef is certified organic and who participate in the marketing of their products. Simone Tully is the marketing manager of the firm. The Tullys also grow cattle and are owners in the cooperative. The idea of OBE grew out of a perceived market demand for an organic beef product. Since its inception four years ago, the producers have created their growing protocol and interviewed packers who would meet their stringent processing requirements. They have also developed a small but growing market in Japan. Before OBE, the participating producers were already close to organic because of the unique environmental characteristics of their region, the Channel Country, and the risks involved in their becoming certified organic are relatively small. With the documentation required for organic and RFID ear tags, their cattle also would qualify for the non-hormone-treated market in the European Union. Because most of the members' cattle are Hereford or Hereford crosses and they are grass fed and non-hormone treated, the cattle would qualify for Hereford Prime as well.

Nolan's Meats is a small, family-owned beef processor that has integrated back into cattle feeding on approximately half of the cattle they process. They use the MSA grading system to predict and guarantee a satisfactory eating experience. ISO 9002 certified since 1995, the company uses the certification information to improve plant efficiency and product quality. Nolan's Meats uses MSA grading and ISO QA in plant to differentiate their product from the competition of multinational companies such as Cargill and Conagra. In the process of remodeling, the company added a new beef kill floor that processes 480 head a day, but it still uses an older, smaller processing room. The company also is investing heavily in environmental technologies to control odor from the plant and rendering facility.

On a large scale, the Cargill plant at Tamworth represents part of the supply chain to Woolworths, one of the two largest retail grocery chains in the country. Currently, 75 percent of Tamworth product goes to Woolworths, and Tamworth supplies 90 percent of Woolworths beef in New South Wales. Cargill is in discussions with Woolworths about building a new case-ready plant at the Tamworth location. The current plant processes 700 cattle a day but is planning to double shift in the coming year. The plant was owned by the city of Tamworth before it was purchased by Cargill, who converted it from a multispecies to a beef-only plant. Over the last couple of years, the plant has been remodeled to provide more space. On the day we visited, there was no noticeable odor at the site. The plant reports a very low turnover of workers. Starting pay is AUS\$250/week after taxes and increases to AUS\$700/week take home at the high end; however, workers receive limited benefits. To put it in perspective, this level is more than teachers are paid in Australia.

Summary

Cattle Care, MSA grading, and NLIS are all examples of programs that were built with industry and government cooperation but that are voluntarily adopted by individual producers or processors. This investment in expensive research and development of infrastructure allows smaller supply chains to adopt the systems and differentiate their products in the marketplace. Because they are voluntary programs rather than mandatory, supply chains can separate from the commodity market using tangible information and technology to add value to their products. Comparable QA programs exist or are being developed in New Zealand but are led largely by individual companies. These firms must shoulder the entire burden of investment in development costs and thus may be slower to develop such programs. At the same time, New Zealand processors are dependent on the export market and look to their major export customers for minimum requirements for market access.

Most differentiated beef products in the United States are based on breed characteristics, for example, Certified Angus Beef and Certified Hereford Beef. The USDA Agricultural Marketing Service website lists over 50 “certified” programs, but few require preharvest information or provide product traceability. However, there are a few notable exceptions. Laura’s Lean is a natural product that utilizes very lean animals slaughtered at a young age and requires individual identification and documentation over the animal’s lifetime. PM Beef is “process verified” by the USDA Agricultural Marketing Service to provide greater production control and trace-back. Cattlemans Collection, a retail product for Kroger’s, is processed by Excel (a division of Cargill) and carries a “verified tender” label. The cattle originate from a relatively small number of ranches and feedlots. The procedures used with the product are similar to the MSA variables discussed. Other programs rely primarily on general genetic characteristics, as well as grain-fed and USDA quality grade specifications. Many of these attributes can be determined at the slaughter plant or even post-harvest. Thus, differentiation is achieved by sorting the commodity beef to try to receive higher overall value rather than producing a “non-commodity” product. Beef production and marketing are more standardized in the United States than in either Australia or New Zealand. Fed cattle represent approximately 85 percent of cattle slaughtered, and 90 percent of U.S. beef is consumed domestically. Most feedlot nutritional programs are similar. U.S. consumers by and large still trust the USDA to ensure beef safety and to provide quality indicators using quality grades. There is perhaps less incentive to differentiate one’s product based on safety (if it is all safe) or quality (if it is all graded the same). Australian and New

Zealand production systems differ within their countries, and they have multiple export customers, often with unique demands. Documenting and proving production processes, expected eating experiences, and the unique features of beef products to diverse consumers is necessary for these countries.

Slowly and from a small base, individual supply chains in the United States are breaking away from the commodity model, but it is often a difficult journey. Most U.S. customers are satisfied with the existing commodity system. Risk-averse producers are reluctant to adopt and/or document production practices that increase cost without some assurance of higher revenues in return. Processors continue to rely on post-harvest treatment of commodity beef to add value by sorting, packaging, preparing, or advertising for changing consumer needs. They only need a safe raw product. The new differentiated supply chains are focusing on production practices (natural) or genetics and often require additional documentation and quality assurance systems. Likewise, export markets may require additional information to access markets. These changes may provide U.S. producers with economic incentives to follow the lead of Australian and New Zealand systems.