
Sponsors

University of Minnesota

College of Veterinary Medicine

College of Agricultural, Food and Environmental Sciences

Extension Service

Swine Center

Editors

W. Christopher Scruton

Stephen Claas

Layout

David Brown

Logo Design

Ruth Cronje, and Jan Swanson;

based on the original design by Dr. Robert Dunlop

Cover Design

Sarah Summerbell

The University of Minnesota is committed to the policy that all persons shall have equal access to its programs, facilities, and employment without regard to race, color, creed, religion, national origin, sex, age, marital status, disability, public assistance status, or sexual orientation.

Value chains: A strategy for the agri-food sector

Jerry Bouma BS, MS

Toma & Bouma Management Consultants, Edmonton, Alberta, Canada, gbouma@infostream.ab.ca

Abstract

This study outlines how a commodity based agri-food economy, such as the province of Alberta, must address and adopt structural change specific to organizational and marketing structures—if it is to develop a “value-added” agri-food sector. The study begins by addressing the current situation worldwide and analyzes the Alberta agri-food sector in context. It follows by examining value chains (supply chains) as an organizational structure as well as exploring implementation and management processes. Finally, the study documents the development of value chains in agri-food industries around the world, details a range of operational and management issues, presents a series of case studies, and concludes with recommendations for program design.

Introduction

In late 1995, the province of Alberta commissioned a strategic analysis (Toma & Bouma, 1996) to address the “value-added” challenge put before the agri-food sector by the Minister of Agriculture. Alberta, a major producer of agricultural raw products—most notably cereal grains, oilseeds, beef cattle, and hogs—was seen to be lagging in terms of the development of food and further value-added processing. Value-added enterprises have the opportunity

to be a major economic driver and wealth creator, leading to greater levels of employment and business activity. To this end, the Minister declared the objective to develop a \$20 billion value-added sector by the year 2010—a threefold increase over the 1995 activity levels (\$6.2 billion).

This study, completed in April of 1996, undertook to review value-added development strategies and experiences throughout Canada and around the world. Our study presented the following key findings:

- The province of Alberta is the largest producer of agri-food products at the farm gate within Canada. The food processing industry has also grown but remains undeveloped in comparison to Ontario. In this regard, the ratio of Food and Beverage Shipments to Farm Gate Sales in the province of Ontario is 3.4 to 1; in Alberta the ratio is 1.04 to 1 (**Table 1**).
- The Alberta food and fiber sector operates at the lower end of the value chain. Furthermore, for the period of 1984 to 1994, there is no evidence to indicate that change is occurring in the level of value being added relative to the raw material base.
- Alberta has three key limiting factors in the development of value added activities. Our detailed SWOT analysis identified these to be:

Table 1: Ratio of “value added” processing to farm gate production^A

Region/Province	1984	1994	Average for the 10 year period ^B
Atlantic	3.47	4.22	4.25
Quebec	3.16	2.88	2.97
Ontario	2.72	3.41	3.09
Manitoba	0.83	0.70	0.82
Saskatchewan	0.20	0.21	0.24
Alberta	0.95	1.04	1.04
BC	2.73	2.75	2.83
Canada (Overall)	1.77	1.80	1.92
Netherlands	1.96 (1987)	2.15 (1993)	Not Available

^ASources: Statistics Canada, Cansim Data Base: 1984 to 1994; Facts and Figures 1996/97, Ministry of Agriculture, Nature Management and Fisheries, The Netherlands

^BSome region/province “averages” exceed both the 1984 and the 1994 ratios. This means that the ratios for the intervening years (1985 to 1993) exceeded the 1984 and 1994 ratios.

- *Marketing system:* These are decidedly focused on single desk selling and commodity pooling and not on market and product development. These systems and organizations are seen to constrain growth and/or inhibit the ability to develop differentiated quality products.
- *Marketing capability:* This is a skill (and resource) limiting many small food processors and entrepreneurs.
- *Product development:* There is often a lack of innovation, research, and development which is needed to develop new products
- Alberta must focus on the development of differentiated, quality-based products. This conclusion is based on a review of several development models from around the world. Furthermore, these strategies must be market-driven, be based on a strong research and development capability, and allow for the formation of strategic value (supply) chains to develop market opportunities. Finally, it is observed that, in many cases, successful strategies are implemented through the leadership of an independent organization with a source of core funding that diminishes over time.
- Strategic alliances, value chain alliances, the formation of business groups, and long term business relationships are critical for the survival and growth of the Alberta agri-food sector. Furthermore, improved packaging, the ability to maintain freshness, information technologies, logistics, and efficient transportation systems are transforming the economics of distribution. Companies seeking survival and growth will require an alliance strategy of some type. This may be local, regional, or international. In Europe, this phenomenon is termed as supply (or value) chain based competition, where food processors do not compete individually for market position (Hughes, 1994). Rather, they compete as part of a supply chain system that is targeted to meet the specifications of a particular market segment and retail/distribution channel.

These findings resulted in the recommendation of two fundamental strategies for the Alberta agri-food sector to compete in a global market. These are:

- Compete on a lowest cost basis; commodities and undifferentiated products compete on this manner, which are typically low margin (e.g., beef or pork).
- Focus on becoming a niche player with distinctly defined benefits and value chain relationships to the buyer. In this regard, value is defined by a combination of factors including price, quality, health and/or safety standards, and organizational structures. Margins are typically much higher for niche products (e.g.,

prepared foods) in comparison to commodities or undifferentiated products.

The study concluded by recommending the adoption and implementation of a Value Chain Initiative to lead the process of value chain formation in Alberta. The Agri Chain Competence Foundation, established in the Netherlands in 1993, inspired this recommendation. This public-private partnership enabled the restructuring of the Dutch agri-food sector and sets a precedent for Alberta as a model for value chain formation.

Developing the Value Chain Initiative: Methods

In addition to the 1996 value chain recommendation, the Agriculture and Food Council of Alberta committed to a process to develop the Value Chain Initiative (Toma & Bouma, 1998). The Agriculture and Food Council of Alberta is an industry based organization founded in 1992 to provide leadership as well as facilitate new initiatives to stimulate the development of a competitive agri-food sector. Their development process comprised three steps:

- Developing an international body of knowledge specific to value chain development around the world
- Learning methods and management processes from relevant case studies
- Designing a Value Chain Initiative for Alberta

The emergence of value chains as an organizational structure

The emergence of value chains as an organizational structure reflects a continued evolution of the market economy. Value chains are intuitively simple. In essence, value chains respond to the demands of the customer more effectively and more efficiently. They do so by building collaborative management structures as well as information systems that enable each "link" in the chain to work closely together, thereby creating a system that, in its entirety, is better able to respond to customer demands and market changes (Underhill, 1996).

Value chains are defined by the authors (Toma & Bouma, 1998) as follows:

A strategic collaboration of organizations for the purpose of meeting specific market objectives over the long term and for the mutual benefit of all links of the chain.

Though conceptually simple, value chains represent a marked change in management behavior and organizational strategies. Traditionally, agri-food markets operate by selling non-differentiated commodities using arms-length transactions such as auctions or pooled pricing mechanisms. Within this context, the further removed a chain link is from the final customer, the less knowledge

it has of customer preferences. Further, traditional relationships are often characterized by a measure of mistrust. Consequently, this system is not well positioned to respond to market change. Necessary change is either slow or perhaps missed altogether. This phenomenon is referred to in some sectors as a “series of disconnects”—the fractured or inefficient flow of information from the customer back to each link of the chain.

In contrast, value chains provide a process and a structure to respond to specific markets and customer purchasing patterns. To this end, the value chain is defined by collaboration across the links and is rooted in the development of trusting relationships and the sharing of information, costs, and benefits. The chain structure is linked by means of interactive information systems and data sharing. These systems allow each chain link to respond to customer preferences and market changes both in the immediate term and, more importantly, over the long term (van Dalen, 1998).

Factors driving value chain formation

Value chain formation within agri-food systems depends upon several key market drivers. These include:

- **Food safety issues:** This is an important public concern as a result of such incidents as *E. coli* in ground beef, mad cow disease in bovines, and swine fever in hogs.
- **Product quality:** Retailers are demanding increasingly higher standards, both in the areas of product specifications (e.g., size, color, texture) and product composition.
- **New product innovation and differentiation:** The competitive marketplace places a premium on new product development. Experience illustrates that long term “supplier” relationships can effectively enhance innovation and new product development.
- **Lowering system costs:** The drive to reduce the number of non-conforming products and to reduce logistics costs such as shipping and warehousing is a powerful motivator to organizing more effective systems.

Value chains develop according to different industry drivers which vary by region. In other words, localizing the value chain strategy is important. See **Table 2** for a summary.

Perhaps the most illustrative example of strategic value chain formation can be found in The Netherlands. With the formation of the Agri Chain Competence Foundation in 1995 and an overall budget of 90 million guilders (approximately CND \$75 million), over 60 value chain pilot projects have been initiated.

Table 2: Summary of major industry drivers of value chain development by region

Region	Major organizational driver
The Netherlands	Public-private strategic approach involving industry, government and research institutions
United Kingdom	Major retailers with some government support
Japan	Retailers and trading companies
Australia	Japanese market requirements; industry associations
USA	Niche players: some movement at the large company level
Canada	Fragmented, but beginning to emerge in several sectors

Value chains management and operations: An emerging management science

Value chain knowledge is a newly developing management and organizational process. A detailed review of the Agri Chain Competence Foundation in The Netherlands provides the following insights:

- The strategic development of a value chain strategy requires a “top down-bottom up” approach. More specifically, “top down” commitment and leadership is required from the industry’s senior executives, from government’s senior politicians and bureaucrats, and research institutions’ senior directors and scientists. The “bottom up” elements come from industry in terms of the actual ideas to be tested and implemented as potential value chain projects.
- The success of value chains is highly dependent on the ability of potential chain partners to cooperate with each other in order to identify and commit to win-win situations.
- Experience to date illustrates that experienced third-party management or professional project managers are often necessary to guide the partners through the development process.
- Furthermore, experience demonstrates that the identification and execution of a pilot project is an essential first step to build trust and to affirm the benefits of working together.
- Chain formation may be motivated by a number of different drivers (Rijnconsult, 1998), each with different dynamics and potentially different “types” of

chain players. The three most common chain drivers include the following:

- *Market differentiation:* This typically involves the development of niche markets and is most appropriate for smaller organizations working to develop specialty markets.
- *Quality assurance:* This requires the development of detailed quality assurance systems from primary production to retail. This type of chain may be small scale or involve an entire sector strategy (such as the beef sector) involving major producer organizations and large-scale food processors and retailers.
- *Chain optimization:* Logistics costs need to be reduced; these can include a range of transaction, delivery, warehousing and delivery, costs. Typically these chains require a strong operations research focus to identify system bottlenecks and to seek out inefficiencies best suited for improvement.

Learning from relevant case studies

Our value chain study undertook five detailed case studies for the purpose of observing first-hand how the chains originated as well as how they are managed and operated (Toma & Bouma, 1998). Each case-site was visited personally, during which an extensive series of interviews was conducted with the various chain members.

The key case study findings and their relevance to Alberta are shown in **Table 3**. Detailed case study reports are available to interested readers by contacting the author of this paper.

Value chain development within the hog sector

The traditional organization of the hog sector is undergoing massive transformation in North America and around the world. Technologies that offer cost savings such as segregated early weaning, split sex feeding, all-in/all-out batch production, sophisticated genetic management programs coupled with processor-feed company strategic

Table 3: Key case study findings and their relevance to Alberta

Case	Key findings	Relevance to Alberta
Plantania, The Netherlands	Demonstrates the principle of “chain reversal”—the strategic flow of product information from the consumer to the grower. Illustrates how a group of Dutch potted plant growers have proactively strengthened their business relationship to a major retailer.	Case illustrates that growers can develop market power. Consumer knowledge is the key element to the new business strategy. Shows the importance of strategic information collection and transfer systems (the Datawarehouse).
Sainsbury Traditional Beef, United Kingdom	Demonstrates the feasibility of establishing a branded fresh meat product—linking qualified producers, a dedicated meat processor, and retailer	Illustrates to Alberta—a major beef producer—that a fresh meat product can be branded based on product quality attributes and supply chain management practices.
Warburton Wheat Chain, Canada and United Kingdom	Demonstrates the ability of an UK marketer to build a quality image in the market based on flour processed from a blend of specific wheat varieties grown in the Canadian prairies.	Offers an alternative method of managing the production and marketing of specific wheat varieties in contrast to the traditional pooling arrangements typical of the Canadian Wheat Board.
Nissho Iwai Organic Chain, USA and Japan	Demonstrates how specific market opportunities for organic vegetables can be developed from market (in Japan) to production (Northwest USA).	Offers Alberta producers an alternative model for enterprise development—starting with the market and then planning production.
Vineland Growers Co-op, Ontario	Demonstrates how a commodity-based farmer co-operative transformed from being a fresh peach supply organizer to a product marketer.	Shows Alberta speciality crop producers that producer-based organizers can successfully develop market capabilities using value chain management principles and professional marketing expertise.

interests are changing the structure of the industry. Examples in the US include the following:

- **The Michigan Livestock Exchange/Thorn Apple Valley, Inc:** In 1994, the Michigan Livestock Exchange signed a 10-year supply agreement with Thorn Apple Valley (TAV), a processor located in Detroit. The arrangement establishes a long-term procurement and pricing arrangement from three states (Michigan, Indiana, and Kentucky) and the provision of capital from TAV to assist producers to build state of the art facilities.
- **ValAdCo:** This is a new generation co-op located in Renville, Minnesota. Founded in 1991, the swine production cooperative has over 40 members—each member carries the right and the obligation to deliver a fixed amount of corn (5,000 bushels per share) to the account of the cooperative. The organization owns one third share of a feed company (United Mills), a hog multiplier unit (1,250 sows), and two commercial units (each 2,500 sows) with separate weaner and finisher units. Finished hogs are being marketed to three packers, mostly on contract.

Within Canada, similar systems are developing. Examples include the following:

- **Signature Pork Program:** This is a Maple Leaf Foods (MLF) program that offers contract agreements to independent producers meeting specified quality and production standards. The objective is to bring to market a branded pork product as part of the Maple Leaf Foods line of products. MLF offers a variety of services in exchange for supply agreements including nutrition/feed, production advice, and interest free loans for expansion, assistance to implement HACCP as well as rendering. In turn, the producer qualifies for a premium-pricing grid tied to carcass performance.
- **Landmark/Elite Swine Program:** Landmark, a Winnipeg-based feed company, has established a swine production scheme that encompasses the provision of quality stock (produced from the Elite Swine program), production and marketing services, and a feeding arrangement. In effect, the producer provides the facilities, labor, and management; Landmark provides everything else. The Landmark program is now prairie-wide and is an example of strategic production arrangements now in place by several organizations including Feedrite, Cangro Processor (a Sask. Wheat Pool company), and Puritone, a Manitoba-based feed company.

Both of the above are examples of early-forming value chains.

Implications for the agri-food sector

The value chain study concluded the following:

- Value chain formation is occurring rapidly in other food producing regions. Furthermore, the prevailing forces driving chain development are likely to intensify further. Indeed the evidence suggests that long term competitiveness as a food supplier will depend upon the continuous improvement of such factors as market differentiation, quality assurance, and reducing system costs—all of which can be addressed within a value chain structure. In summary, the linkage of food production to the ultimate customer by means of value chains is becoming an essential competitive strategy.
- Value chain formation is conceptually simple but operationally difficult. Considerable efforts are required to increase the awareness of value chains as a competitive response to a changing market place. In addition, it is essential to ensure that a chain formation as well as a management skills development process is put in place to assist in the successful start-up and operation of value chains.
- While value chains will occur “naturally” as a pure commercial response to the changing market, they do represent a fundamental change as to how companies and traditional agri-food supply systems will operate in the future. To this end, a value chain program helps facilitate—and, in some cases, lead to—the change process. This occurs in three areas:
 - *Awareness and education:* This specifically increases the awareness of and information pertaining to value chains within the agri-food industry.
 - *Training:* Resources must be provided to ensure that value chain management and operation skills training are provided to the industry and perspective chain managers.
 - *Seed funding:* This will assist emerging industry chains in establishing pilot projects designed to meet specific objectives as well as build the experience base needed to work together over the long term.

Designing the Alberta Value Chain Initiative

The province of Alberta, under the auspices of the Agriculture and Food Council, launched the Alberta Value Chain Initiative in early 1999. The program has two specific objectives:

- To increase the awareness, knowledge, and associated skills within the Alberta agri-food sector specific to value chains and how they can add to the competitiveness of the sector

- To accelerate and support the formation of value chains through the establishment of successful pilot projects

Structurally, the Alberta Value Chain Initiative has three components:

- **Value chain awareness:** This is a communications and awareness program under the direction of the Agriculture and Food Council to create greater awareness and knowledge of Value Chains within the Alberta agri-food sector.
- **The Value Chain Project Development Program:** This program offers financial support for pilot projects that lead to value chain formation. Funding is provided in three stages:

1. *Feasibility research:* This funding is intended to support the identification of opportunities and their feasibility for value chains.

2. *Pilot project planning and design:* This funding is to support the detailed design, management, and operations plan for a pilot project.

3. *Pilot project implementation:* This will support the implementation of the pilot project to test the opportunity and feasibility that may lead to the establishment of a value chain.

Funding applications and approvals are structured to reflect the logical and progressive development of typical value chain projects. For example, some project ideas will be determined to be unfeasible (and therefore not proceed beyond Stage 1); others will proceed and be developed further to a formal planning stage but may not maintain the support of all chain members (and therefore not proceed past Stage 2).

- **Strategic initiatives:** This provides funding for broad-based initiatives or studies that contribute to the body of knowledge pertaining to the value chains and their relevance to the Alberta agri-food sector.

In addition, the Agriculture and Food Council has established an internal Value Chain Committee and has hired a Value Chain Leader to provide leadership and manage the Value Chain Initiative.

Conclusion

The Alberta Value Chain Initiative is in its infancy but is currently receiving enthusiastic support from the industry and neighboring provinces. Several pilot projects are under way and/or in early development stage. Value chain awareness and formation is becoming a primary issue for many producers, processors, industry associations, and

commodity groups across the Province and in Western Canada.

Subsequent to the launch of the Value Chain Initiative program, the neighboring province of Saskatchewan has taken steps to develop a similar program. Interestingly, the province of Ontario, Canada's most developed agri-food production and processing sector, is also expressing interest in the Value Chain Initiative as a new tool to assist in restructuring its agri-food sector. The province of Alberta is now recognized throughout Canada and North America as the leader in value chain and value-added development.

References

1. Hughes, David. 1994. *Breaking with Tradition – Building Partnerships & Alliances in the European Food Industry*, Wye College Press, Wye, Ashford, Kent, United Kingdom.
2. Rijnconsult, 1998. *Vertical Co-ordination in the Agribusiness and Food Industry – Background, Methods and Cases*, unpublished workshop handout.
3. Toma & Bouma. 1996. *Changing Course – The Value Added Agri-food & Fibre Strategy for Alberta*, Alberta Agriculture Food & Rural Development, Edmonton, Alberta, Canada.
4. Toma & Bouma. 1998. *Value Chains As a Strategy*, Agriculture and Food Council of Alberta, Leduc, Alberta, Canada
5. Underhill, Tim. 1996. *Strategic Alliances, Managing the Supply Chain*, PennWell Publishing Company, Tulsa Oklahoma
6. van Dalen, J.Chr. 1997. *Chain Theory Deployment – Searching for Productive Chain Knowledge*, Provisional Draft for Discussion, Wageningen Agricultural University, The Netherlands.

