

## **CHAPTER 1: INTRODUCTION**

### **1.1 Beef Industry Setting**

Agricultural marketing is definable as the action of events that bring farm products to their ultimate end use (Collins). In the beef industry, a fresh beef product offering is the culminating effort of at least five separate entities: the cow/calf producer, stocker operator, feedyard operator, processor, and retailer. In order to ensure that consumer's demands are met at the end of the beef supply chain, there is a need for coordination of efforts between each participant. The coordination of demand needs and supply of product within the production-marketing system is necessary for the future viability and growth of the industry as a whole (Kohls and Wiley).

In 1959, Collins defined three specific conditions that must exist for effective coordination to be achieved within a marketing system:

- A communication network that links all performance units in the system;
- A language or set of signals to send through the communication network and accurately characterize relevant economic variables, most importantly consumer demand signals; and
- Each party within the system must be willing and able to translate the signal received, ensuring that the offered product meets consumer demand signals and achieves long-term success.

Historically, market prices have been used as the coordination signal for transmission through the beef marketing system. Today, the majority of live cattle marketing is accomplished on a liveweight basis, the same method used in the past, with market prices serving as the coordinating mechanism between producers, feeders, and packers. The use of prices as coordinators agrees with modern economic thought. Price is considered to be the mechanism of exchange with the lowest transaction costs that governs economic association among individuals (Davidson and Weersink). Koontz and Purcell identify the two economic contributions with which the price element of markets has always been charged: (1) guiding allocation of resources across alternative uses, and (2) providing for the coordination of production and marketing activities in order to ensure that what is produced meets consumer preferences and needs.

Despite its widespread use, the failure of price as an effective coordinator for the beef production system has a long history. Purcell noted the existence of communication problems in 1973 between beef industry participants. The exposed conflicts and inconsistent messages between inter-stage agencies stood in direct violation of the clear communication network and translation abilities Collins had observed to be mandatory. As a result, Purcell questioned whether price could function effectively in its resource allocation and communication roles.

Purcell revisited the topic of price failure in 1995 and presented a link to inadequate grades and standards. Price mechanisms must coordinate through use of a description system like grades that attaches appropriate premiums and discounts to products. These price signals to the producer must evoke positive management change to meet the customer's needs. Therefore, the identification system must possess descriptive terminology that identifies all significant value-related attributes. Purcell noted that grades must be aligned with the needs of the year 2000 and beyond if prices are to continue to serve as a coordinating mechanism. If not, the industry would move away from traditional price-based marketing systems. Surveys of industry participants confirmed Purcell's emphasis on grades. Schroeder et al. (1996) indicated that the current federal beef quality grading system was too subjective and questioned its ability to accurately measure quality, thus affecting value estimates.

In 1997 Koontz and Purcell continued to discuss the failure of prices to coordinate the beef marketing system. Sentiment at the time had called on Congress to investigate price discovery issues in the beef industry. Koontz and Purcell characterized the attention being focused on price discovery as a reaction to the failure of prices to coordinate vertically related stages along the production-marketing chain. The authors argued that the problem was market failure brought on by a price information and price discovery system that was approaching the status of a public good. Therefore, strong incentives were present for development of private price discovery and marketing systems that coordinate production more effectively than systems based on public market prices.

The failure of market price coordination in the beef industry created a large incentive for development of alternative market coordination methods. Many of the alternative structures utilize non-price methods to achieve the needed coordination between the economic levels in the system. Traditionally, all adaptations moving away from market price as coordinating

mechanism have been organized under the “vertical coordination” subject heading. Researchers concentrating on problems with coordination within the beef supply chain have customarily turned to this literature for insight. As a result, the body of vertical coordination literature is quite large.

## **1.2 Vertical Coordination in the Beef Industry**

Investigations into the extent of, motivations for, and implications of vertical coordination within the beef industry have been developed extensively since the mid 1990’s. Hayenga et al. provide an excellent overview of research findings on beef sector contracting and vertical integration, and the following discussion is based largely on their review. Overall, research on beef sector coordination has allowed for analysis of the motivations for cattle producers and beef packers to become involved in contracts and marketing agreements. Three main motivations exist: (1) reduced costs, (2) enhanced risk management, and (3) improved beef quality issues (Hayenga et al.)

Beef packers and cattle producers are both concerned with reducing costs and improving their margins whenever possible, and they can often achieve these reductions through the use of contracting and forward marketing agreements. Beef packers must ensure a steady supply of slaughter cattle into their processing facilities to operate near capacity and achieve significant cost savings. Anderson and Trapp estimated that increasing plant capacity utilization by 20% reduced slaughter and fabrication costs by \$16.20 per head. The cost savings from a more coordinated supply flow and operating facilities near capacity is a large motivation for packers to secure cattle through contracts and marketing agreements with producers and feeders. Producers also realize the benefits from non-price means of coordination. Beef producers are able to share in the reduced costs of packers through the better prices associated with reduced processing costs (Schroeder et al. 1998).

More effective risk management can be accomplished through the use of contracts and marketing agreements between beef packers and cattle feeders. Ward and Bliss found that contracts enable cattle feeders to get better financing. In addition, contracts that establish forward prices reduce price risk for both beef packer and cattle feeder. Cattle feeders have also

increased access to an optimally timed market outlet through the use of contracts. By arranging for the delivery of fed cattle in advance, feeders can coordinate cattle flows and reduce the risks of keeping cattle on feed too long. Anderson and Trapp found the financial consequence of this risk to be substantial; selling cattle one-week before optimum time reduces profit by an estimated \$6/head, and one week past by about \$2/head.

Beef producers and packers also address product quality issues through the use of contracts and marketing arrangements. Traditional live weight cattle pricing sends incorrect quality signals throughout the beef supply chain (Lamb and Beshear; Schroeder and Mark; Schroeder et al. 1998; Smith et al. 1992 and 1995). The inability to coordinate effectively and the resulting poor quality and related consumer level issues led to beef demand declining by nearly 50% between 1980 and 1998 (Purcell 1998; Schroeder, Marsh, and Mintert). Schroeder and Graff estimate high quality cattle subsidize low quality cattle by an average of \$30/head when marketed via traditional live weight methods. Sizeable incentives therefore exist for contracts and marketing agreements centered on value-based grid pricing, allowing for more accurate quality signals to be sent to producers.

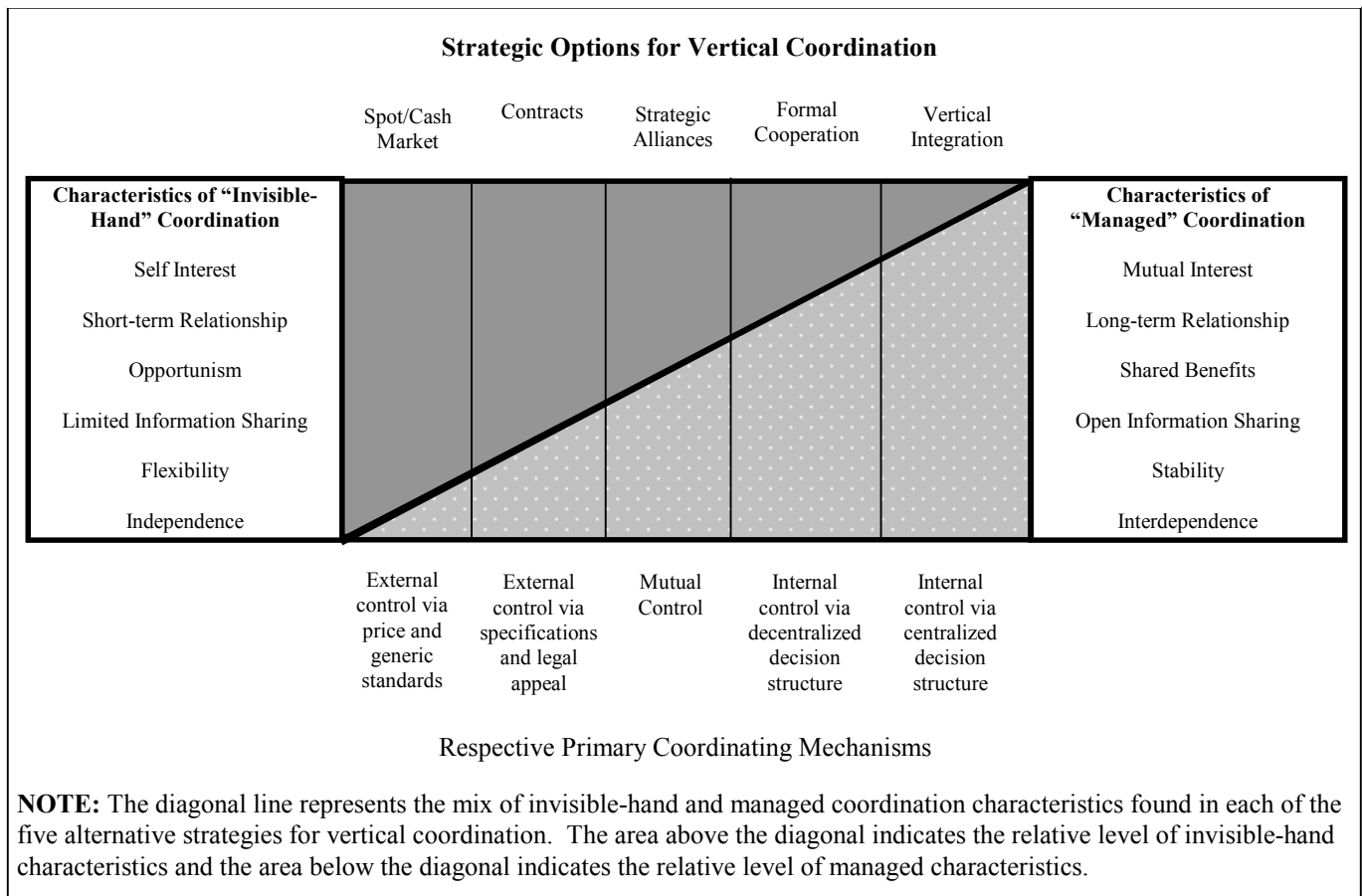
The increased use of value-based pricing grids also reflects the packer's need for access to cattle that have quality traits necessary to satisfy consumer demand. Producers have witnessed large pricing errors when they sell their cattle on a live weight basis, and they seek to capture premiums on cattle they know possess superior attributes (Schroeder and Graff). Not all grid pricing systems are identical, so producers who have made genetic or management adjustments or other value-added investments have an incentive to seek out long-term marketing agreements with processors who have the best value-based pricing system (Ward and Lee).

There is also a large body of literature on possible adverse impacts of vertical coordination in the beef sector that comes from captive supplies of beef and packer feeding of slaughter cattle. The issue of whether or not vertical coordination results in abuses of market power by participants is beyond the scope of this research effort, however.

### 1.3 Strategic Alliances as Coordination Strategy

Vertical integration and open market transactions do not represent the only choices of vertical coordination available to participants in the beef industry. Instead, integration and spot transactions are the endpoints of a broad organizational continuum (Peterson and Wysocki; Contractor and Lorange). At one end, open market or spot transactions exist with market price as the coordinating mechanism. Supporting the market price is a system of grades and standards that should accurately define those quality characteristics to which the consumer attaches value. At the other end, management control serves as a coordinator via vertical integration. Figure 1.1 from Peterson and Wysocki depicts the continuum, and the mix of characteristics associated with each vertical coordination form.

**Figure 1.1: The Vertical Coordination Continuum**



Source: Peterson and Wysocki; Copyright © 1997 by H. C. Peterson and Allen Wysocki

The third portion of the continuum in Figure 1.1 represents strategic alliances as facilitators of market coordination. The strategic alliance may be defined as a relationship in which the firms involved share risks and benefits emanating from mutually identified objectives (Badarocco; Martin; Peterson and Wysocki). Regardless of definition, a strategic alliance is formed by entities that retain their individual and separate identities. These partners work together to attain their common objectives, meanwhile finding methods to resolve differences, distribute captured profits, and equitably share risks.

Several strong incentives exist for the formation of strategic alliances in beef, and popular trade publications and extension personnel working with the livestock industry have begun focusing attention on branded-beef programs and other marketing alliances within the last decade. These value-added and strategically targeted marketing alliances attempt to eliminate barriers to coordination between levels in the supply chain through the sharing of information, risk, and premium values. Nearly all include the adoption of value-based pricing, accomplished primarily through formula or grid pricing, designed to improve the price signals or communication between vertically related stages of the production chain. These efforts are attempts to perform the role traditional open market prices failed to maintain: effective price discovery (Schroeder et al. 1998).

Industry surveys show that nearly all packers and most feeders expect alliances and grid pricing to increase (Schroeder et al. 1998, p. 22). Most surveyed by Schroeder et al. believed the use of alliances and grid pricing would expand to about 30% of fed cattle slaughter in the near future (1998, p. 22). A decrease in the adversarial relationship between feeders and packers was cited as a major reason for the increasing emergence of alliances in the future. In short, alliance structures have the ability to effectively convey appropriate price signals between stages of production, a function the open market coordination system has failed to perform.

## **1.4 Problem**

Observations by analysts provide a base upon which a problem statement can be built.

*“In brief, the new food market relies less on prices set in the trading pits of major commodity exchanges and more on private negotiations behind closed doors to divide risks and profits among farmers, food processors, and retailers. Thus, the transition in the food system opens the question of how the risks and profits of the new market system will be shared among the players from the traditional market” -- Alan Barkema*

*“The formation of marketing alliances and development of value-based pricing grids have partially addressed the issue, but problems remain. Substantial discounts for “out” cattle easily can negate any premiums earned on pens of high-grading cattle. And for many cattle, overfeeding to reach a high quality grade is a losing proposition. They eat up any potential profits in the feedyard regardless of carcass premiums earned at the plant” -- Drovers, Sept. 1999, p. 44*

*“How the savings associated with reducing costs, by decreasing variability in slaughter levels via forward contracts and other means of coordination, would be shared was beyond the scope of this study. But the benefits will, of course, be distributed across cattle feeders, producers, and packers” -- John D. Anderson and James N. Trapp*

*“The manager’s task now involves selecting the boundaries of the firm (defined by contractual and asset control relationships) along with the more traditional tasks of choosing the firm’s size, enterprises, and financing. Analysts must now provide guidance about the boundary choice and about performance evaluation of firms with different boundaries, where the location of decision control may be more influential than who holds ownership claims on specific assets” -- Peter J. Barry, Steven T. Sonka, and Kaouthar Lajili*

The underlying causes of increased vertical coordination in the beef sector are well established. Theoretical frameworks for dealing with vertical coordination have been developed, and continue to evolve. Empirical research has revealed many benefits and costs of increased levels of coordination between members of the beef supply chain. However, statements like the ones above depict the broad array of problems still faced by beef industry managers dealing with specific vertical coordination issues.

Most of the prior theoretical work has focused on the two ends of the continuum, i.e., spot markets and vertical integration, while the middle area has not been explored in detail, except for the occasional reference to existence of contracting and/or alliances lying along the middle points (Peterson and Wysocki). However, there has been a tremendous shift towards coordination arrangements lying between full vertical integration and spot market transactions during the past decade. In particular, formation of value-based marketing arrangements or strategic alliances has exploded within the past five years. “Industry leaders expect another 60 alliances will form within the next five years” (Drovers, September 1999).

Alliances are not without cost, however. Producers of low quality cattle have found their operations are more profitable under the traditional pricing mechanism, and have continued to market cattle on a liveweight basis at average prices. In this case, the alliance pricing mechanism sent the correct signal for desired cattle quality, but the producers could realize higher profits under live based selling on averages without making changes in management style and type of cattle produced (Schroeder et al. 1998). Other alliance participants have expressed concerns with the base price selected for use in the grid or formula price mechanism.

Expert opinion reveals that newly formed strategic marketing alliances also have difficulty with unique management concerns. Differing risk exposures, risk sharing, and appropriate compensation for all participants each contribute to the complex task of managing the alliance for continued success. The absence of in-depth research on the constructs of alliances inhibits the beef business manager’s evaluation of alliance opportunities.

Managers within the livestock industry must be prepared to guide their organizations through the maze of newly forming alliance structures. The success or failure of the enterprise will depend on whether it can be positioned within a value-based marketing alliance and effectively use the resulting coordination between itself and other supply chain members. In



order to do so, industry members must have access to the information that assists in making correct decisions regarding these new alliance organizations.

**The lack of research and analysis of beef alliances with regards to risk sharing, participant compensation, and alliance design in general limits the ability of business managers to evaluate alternative alliance opportunities. Alliance managers need research based guidelines to implement successful programs that will ensure the future viability of their organizations, attract producer members, and contribute positively to the future of the beef business.**

### **1.5 Objectives**

The primary objective of this research project is to generate information and guidelines on alliances, part theoretical and part empirical, that will enable beef industry managers to make effective evaluations of their value-based marketing options. Information and guidelines developed will focus specifically on three main areas:

- Understanding where alliances fit within the vertical coordination, non-price coordination, and agricultural economics research literature;
- Understanding the process through which beef alliances are created and function to meet participant's needs; and
- Analyzing the impacts of common alliance design choices in dealing with the issues of risk sharing and participant compensation.

The research in its entirety can be seen as a step towards identifying the issues needed for a future decision-making model that deals solely with strategic alliance vertical coordination in the beef industry.

### **1.6 Thesis Structure**

This thesis comprises five chapters. Chapter 1 introduces the topic of vertical coordination in the beef industry and the reasons for its emergence. Chapter 2 provides a thorough literature review of vertical coordination literature pertinent to the research. Chapter 3

develops a conceptual framework for the stages of alliance formation and design. Chapter 4 is an empirically based simulation analysis of alliance compensation and risk sharing designs. Specifically, the simulations output net returns for cattle owners and packers under various margin sharing and premium allocation scenarios. Chapter 5 provides overall conclusions and future research needs to continue providing support for newly forming beef strategic alliances.