

VALUE-ADDING CONTRACT COOPERATIVES:  
INVESTOR AND NON-INVESTOR DIFFERENCES

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## **ABSTRACT**

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This study sought to identify the differences between agricultural producers who invest in value-adding contract cooperatives and those who do not. The producers' decisions to invest were examined in the context of Rogers' Adoption Diffusion Model and Coleman's Social Capital Theory. Hypotheses regarding the influence of personal and farm organizational characteristics, perceptions and attitudes, and cooperative participation on the investment decision were tested.

Of the 553 North Dakota producers who completed the telephone interview, 318 (57.5 percent) returned the mail-out/mail-back questionnaire. Contract cooperative members were segmented into Crop members and Livestock members and were compared to the Non-member group.

Member-investors were younger, farmed fewer years, and reported higher levels of education. They also differed in farm organizational characteristics. Their different perceptions of their role in the agricultural industry may have influenced the systematic differences in attitudes toward these new businesses. Measures of cooperative participation did not reveal substantive differences between the member and non-member groups.

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Agricultural producers on the Northern Plains formed several new, value-adding contract cooperatives (hereafter referred to as contract cooperatives) to increase farm income by processing and marketing their commodities. These firms are highly focused, highly capitalized, and customer-oriented. The use of delivery rights and direct investment suggest that the decision process to join these cooperatives differs from that of traditional cooperatives. Although various studies have addressed traditional cooperative memberships, little is known about the memberships of the contract cooperatives on the Northern Plains. Cooperative managers, researchers, farmers, and potential organizers could benefit from a description of the member-investors (hereafter referred to as members) in contract cooperatives.

This chapter states the purpose, potential outcomes, and scope of the study. A discussion of traditional and contract cooperatives is offered as background.

### **Purpose and Outcomes of the Study**

The purpose of this research was to identify the differences between those who invest in contract cooperatives and those who do not. Using the socioeconomic continuum of the Adoption Diffusion Model (Rogers 1983) and Social Capital Theory (Coleman 1988), the study addresses the following outcomes:

- 1) Cooperative researchers, organizers, and financial institutions can determine the extent to which producers can finance additional stock purchases in existing and proposed contract cooperatives.
- 2) Cooperative researchers, organizers, and managers can determine what variables (personal and farm organizational characteristics, perceptions and attitudes, or cooperative participation) are most likely to indicate investment in a contract cooperative.
- 3) Cooperative researchers and organizers can begin to understand the social conditions in which successful cooperatives were formed.
- 4) Cooperative researchers, organizers, and managers can determine the differences in perceptions of risk between members and non-members.

## **Scope of Study**

This study was confined to a quantitative survey of North Dakota agricultural producers conducted in the Spring of 1996. The dependent variable consisted of the membership and non-membership in one or more contract cooperatives. The names of the contract cooperatives will be protected throughout this thesis for privacy reasons.

Three general hypotheses about the differences between members and non-members were derived from the Adoption Diffusion Model (Rogers 1983) and Social Capital Theory (Coleman 1988). However, there were two distinct categories within the member group. First, two contract-cooperative memberships numbered over 1,000, whereas another two numbered under 300. This membership difference is reflected in the financial size and scope of the businesses. Second, two cooperatives process grain commodities, and two cooperatives process livestock commodities. Therefore, the member group was divided into the Crop group and the Livestock group for analysis. This allows for more thorough analysis and more specific use of the research. No hypotheses or expected directions within the member group are offered. Therefore, hypotheses were tested under the member/non-member grouping.

The Non-member, Crop, and Livestock groups were compared on three independent variable sets. First, producer age and farm financial variables measured personal and farm organizational characteristics. Second, Likert scale question sets were used to measure producer perceptions of their roles in agriculture and their attitudes toward contract cooperatives. Third, the producers' cooperative participation was measured by recording their number of memberships, meetings attended, and officer positions held in four types of cooperatives.

This study does not address the developments that contributed to the prevalence of contract cooperatives on the Northern Plains. Hypotheses regarding the differences

between the two member groups are beyond the scope of this study. The process by which contract cooperatives are organized is also beyond the scope of this study.

## **Comparison of Traditional and Contract Cooperatives**

### **Traditional Agricultural Cooperatives**

Traditional cooperatives are member-owned, member-controlled, and member-benefitting forms of business (Cobia 1989). In the agricultural sector, these cooperatives focused on providing supply, service, and marketing needs for producers. An explanation of the member-ownership, member-control, and member-benefitting principles is followed by a general discussion of traditional cooperatives.

The first element, member ownership, means that a member is any producer, business, or institution that patronizes or conducts business with the cooperative. There is a fundamental relationship between patronage and ownership in any cooperative. Ownership is attained by an equity investment accrued throughout the duration of membership.

Equity in a traditional cooperative is most commonly accumulated through per-unit retains and retained patronage refunds. Per-unit capital retains are patron investments that are based on the value or number of units handled for each patron. These patron investments are deducted from the proceeds of products marketed. Retained patronage refunds are portions of net income allocated to members, but retained by the cooperative. Both of these financing strategies are common and systematic methods to generate equity funds.

The primary distinction between cooperatives and other business forms is that cooperatives return net income to members on the basis of use, whereas other businesses return net income on the basis of investment. Thus, cooperatives seek to increase the profits or economic well-being of their members.

The second element of a cooperative is member control. Patronage or use is linked to ownership, which is linked to control. Control is represented by voting rights. Cooperative control is symbolized as one-member, one-vote. Members elect a board of directors who establishes and votes on policy. In addition, the board decides whether to retain business profits, redeem patronage refunds, or assess the membership in the event of an operating loss. Managers implement board policy. Typically, managers and other employees of traditional cooperatives are not members.

The third element, member benefiting, addresses the benefits or net income of the business. These benefits are returned to the members in proportion to their patronage through patronage refunds or favorable prices. The primary economic benefit of cooperative membership is a patronage refund or dividend on invested capital. Patronage refunds are distributions of net income returned to patrons in proportion to the value of their patronage. Cooperative members share the risks just as they would share in the profits. The members' capital investment is true risk capital subject to loss. The link between cooperative ownership, control, and distribution of benefits lends this business form to provide supply, marketing, and service needs to agricultural producers.

**Membership.** Traditional agricultural cooperatives (supply, service, and marketing) have open membership for anyone who meets the requirements as an agricultural producer. Therefore, traditional cooperative memberships are inherently heterogeneous and support general supply, marketing, and service objectives to benefit the entire membership. Membership is represented by one share of common stock. This stock represents member control (voting rights) and is not used as a financial tool.

Cook (1993) noted that traditional cooperatives originated from survival-defense roots. Agricultural producers formed local associations to address the following motivations: 1) the desire to avoid the negative consequences of market power; 2) the

drive to attain economies in procurement, services, or marketing; 3) the attempt to reduce risk; and 4) the quest to provide missing services.

Cook (1993) identified the drive to achieve additional margins as a fifth motivation for agricultural cooperative development. Groups of farmers may wish to increase prices through their own effort, that is, through self-generated power. Cook defined the goal of additional margins as marketing, processing, or bargaining cooperatives that command a dominant share of a commodity at some level; that show minimal threat of near-term substitution; and that are able to establish a brand name with a degree of consumer loyalty. Cobia (1989) delineates the relationship between efforts to achieve additional margins through value-added processing and the farm business. The extension of the farm business into processing through a cooperative enterprise may accomplish a degree of income stabilization because profits from processing operations are often highest when production is high and farm profits (and prices) are low. In a cyclical commodity system, the total profit from production and processing may be more stable than the profits from either activity alone. A cooperative's net income would offset, to some extent, the variation in income from farming operations.

Two elements of the traditional cooperative's structure inhibit its ability to address the motivation to achieve additional margins for its membership. First, the inherent heterogeneity necessitates a focus on needs that benefit the entire membership. Traditional cooperative structure serves well until member factions surface with different needs and visions for the cooperative. Efforts to achieve additional margins usually focus on further processing a single commodity. Therefore, whereas the entire membership may be required to approve (and finance) a processing facility, it may only benefit a select group of producers.

Second, the predominant financing strategies of per-unit retains and retained patronage refunds may not be sufficient to capitalize the necessary processing facilities to

achieve potential additional margins. In traditional cooperatives, member equity is used to address the four motivations. Member stock in traditional cooperatives does not contribute significant equity to capitalize business objectives. Wadsworth (1991) and Kraenzle (1989) discuss traditional cooperative memberships.

Producers on the Northern Plains modified the traditional cooperative structure to achieve additional margins on their commodities.

### **New, Value-adding Contract Cooperatives**

A new type of cooperative is emerging on the Northern Plains; these contract cooperatives are referred to as "new wave," "new generation," or "closed cooperatives" (Peterson 1994). They differ significantly from the traditional supply, service, and marketing cooperatives because they are highly focused, highly capitalized, customer-oriented businesses. Peterson (1994) identified a cooperative of 2,040 durum wheat producers founded in 1992 as the start of this "new wave" of cooperatives studied in this thesis. Cook (1993) defines these businesses in *Food and Agricultural Marketing Issues for the 21st Century* as:

. . . the result of collective action-oriented founders attempting to address market failure situations, excess supply price depression, cooperative property rights structural weaknesses and free rider issues. Specific solutions in the form of asset appreciation mechanisms, liquidity creating delivery right clearinghouses, proportional patronage distributed control, base equity capital plans and membership policies controlling entrance, are established in their by-laws and operating practices. The initial organizers are as investor-driven as they are user-driven in adapting their financial and governance policies.

Besides the elements of being member owned, member controlled, and member benefiting, contract cooperatives include the element of adding value to commodities.

Contract cooperatives add value by maintaining ownership while completing one or more steps to the commodity, resulting in a product that is worth more than the raw commodity (Egerstrom 1994). Cooperatives historically focused on members, governance issues, and commodity marketing (Gherty 1994). Contract cooperative members want the "middleman's share" of the food dollar and aim aggressively to pursue it by moving their farm business up the food chain (Alster 1994). Producers who wish to increase farm profits invest in processing facilities to refine the commodity and obtain the higher margins as a result of further refinement, packaging, and marketing (Gherty 1994).

In response to the value-added objective, contract cooperatives have adapted limited membership and direct investment to make their businesses better suited to achieve the objective of obtaining additional margins. There is enough perceived value to membership in these cooperatives that members must invest significant capital to purchase delivery rights (Peterson 1994). Stock investments for various new ventures range from several hundred dollars to \$300,000 (Alster 1994).

**Investment Structure.** Producers of the specific commodity must purchase stock to participate in operating dividends. To illustrate, Heart of the Valley Cooperative, a proposed \$12 million venture to process pinto beans into a refried bean food product, offered membership in a three-month, publicized stock offering. The cooperative offered 640 Class A stocks. This \$100 per-member investment represents one voting right per member regardless of total investment. The right and obligation to deliver 100 pounds of pinto beans is represented by Class B common stock at \$25 per share, with a 500-share minimum commitment (Heart of the Valley Cooperative 1995). Class A contract cooperative stock represents voting rights, whereas Class B common stock represents delivery rights.

The limited number of shares and controlled commodity processing levels have additional relevance. The limited number of delivery rights increases the perceived value

of existing shares and allows for stock appreciation. A secondary market in which producers sell the limited shares allows for more shareholder value than simply the return on investment through proportional dividends. The sugar beet processing cooperatives are a common example of stock appreciation. To illustrate, original investors in American Crystal Sugar Company earn significant returns for their beet crop and own shares that have increased in value twentyfold (Alster 1994). Rizzuto-Suhler and Cook (1993) and Moore and Noel (1995) discuss the transferrable delivery rights of contract cooperatives.

**Membership.** The number of shares available to producers is determined by the number of units of commodity that can be absorbed by the processing facility (Stefanson et al. 1995). All producers of the specific commodity have the opportunity to invest in a contract cooperative during the equity drive. After the limited number of delivery rights (shares) have been sold, potential investors must purchase shares from existing members. Although there are minimum and maximum levels of investment, the level of investment is voluntary. However, the member's investment represents a legal commitment to deliver a specified number of units of commodity from each year. In turn, the contract cooperative is obligated to purchase the specified units of commodity from their members. In contrast, there are no inherent delivery obligations in traditional marketing cooperatives. Net income from the contract cooperative is distributed to members proportionate to their investment.

### **Organization of Thesis**

This chapter contained the statement of the problem, purpose and potential outcomes, and scope of this study. A discussion of traditional and contract cooperatives was included as a background to understand the study.

Chapter 2 addresses the theoretical framework, research hypotheses, and the expected direction of the independent variables. The Adoption Diffusion Model and Social Capital Theory are discussed in the context of individual- and organizational-level

transaction costs as they influence the producer's decision to invest in a contract cooperative. A review of relevant research is also included. In addition, three general research hypotheses guided by the theoretical framework are stated.

Chapter 3 delineates the methodology used in this study. Non-member and member-investor sampling and response rates are discussed. The rationale, survey instruments and pretesting, and implementation also are discussed. In addition, this chapter provides discussions of the operationalization of the dependent and independent variables.

Findings are presented in Chapter 4. Statistical significance of producer characteristics, farm characteristics, and producer attitudes between non-members and two member groups are presented.

Discussion of the results and study conclusions are offered in Chapter 5. Methodological suggestions for future membership studies are also offered.

## **CHAPTER 2. LITERATURE REVIEW**

### **Theoretical Framework**

This chapter discusses the theoretical framework and outlines three general hypotheses. Producer investment in contract cooperatives on the Northern Plains is unique because the opportunity to invest is possible only when a sufficient number of producers have outlined the guidelines and goals of the potential organization. Personal observation and analysis suggest that the decision to invest occurs in two dimensions. First, the individual dimension accounts for the attributes of the individual. The second dimension, unique to contract cooperative investment, accounts for the organizational-level attributes, those factors that enable producers to join with others to increase their farm profits. An appropriate theory and methodology should address both of these dimensions. Therefore, a theoretical framework from which to examine the differences between member-investors and non-members should 1) recognize individual attributes, 2) account for the attributes of the proposed innovation, and 3) address the role of social structure that enables individual and group action variables to work together.

First, this section addresses the producers' individual attributes. Rogers' (1983) five adopter categories (innovators, early adopters, early majority, late majority, and laggards) are used as a socioeconomic continuum to isolate potential personal and farm organizational variables influencing the decision to invest in a contract cooperative.

Second, the structural changes of the contract cooperatives (those that differentiate them from traditional cooperatives), which enable producers to join together to increase their own farm income, are examined. These structural changes are examined using the five attributes of an innovation from Rogers' Adoption Diffusion Model (1983). The attributes are relative advantage, compatibility, complexity, trialability, and observability.

Third, the role of social structure in contract cooperative development is examined using the concept of closure from Coleman's Social Capital Theory (1988). Social Capital

Theory offers the potential to isolate the role of social structure in the context of individual producer attributes as well as innovation attributes.

### **Adoption Diffusion Model**

Agricultural producers have control over certain resources that influence their decision to adopt an innovation. Rogers (1983) defines an innovation as an idea, practice, or object that is perceived as new by an individual or other unit of adoption. He defines adoption as the decision to make full use of an innovation as the best action available.

For this research, the opportunity to invest in a contract cooperative is viewed as the innovation. The producer's decision to invest (at any level) in a contract cooperative is viewed as adoption of the innovation.

Rogers (1983) delineates the process that individuals use to adopt an innovation to account for attributes and attitudes of the individual and the attributes of the potential innovation. He developed five adopter categories to examine the dominant characteristics of individuals as they pertain to the adoption process.

## **Five Adopter Categories**

Rogers' (1983) conceptualized important personal attributes on the basis of innovativeness, i.e., the degree to which an individual is earlier in adopting new ideas than other members of a social system. To classify adopters into categories, he recognized that adoption of an innovation followed a normal, bell-shaped curve when plotted over time on a frequency basis. The cumulative number of adopters forms an s-shaped curve. Figure 2.1 illustrates how adoption data can be represented by a bell-shaped frequency curve, or an s-shaped cumulative curve.

Figure 2.1. The bell-shaped frequency curve and the s-shaped cumulative curve for an adopter distribution. Source: Rogers (1983).

Noting the roles of information, uncertainty reduction, and increasing influence on an individual to adopt, in the diffusion process, Rogers (1983) hypothesized that one's degree of innovativeness was normally distributed. That is, adopter distributions follow the bell-shaped curve over time (Figure 2.1) and approach normality. He developed five

adopter categories based on two characteristics of this normal frequency distribution. The first characteristic was the mean (  $\mu$  ) of the sample. The second characteristic was the standard deviation (sd), a measure of dispersion that explains the average variance on each side of the mean. The five resulting categories shown on Figure 2.2 are innovators, early adopters, early majority, late majority, and laggards. Rogers used three categories to the left of the mean (compared to two on the right), noting different characteristics among the innovators and early majority and homogeneity across the laggard category.

Figure 2.2. Adopter categorization on the basis of innovativeness. Source: Rogers (1983).

Rogers (1983) identified the dominant characteristics and values of each adopter category. The following generalizations of the five adopter categories offer a sociopsychological continuum from which to view the producers' decision to invest in a contract cooperative.

*Innovators* are described as venturesome and eager to try new ideas. This interest enables departure from peer networks, which in turn facilitates new social relationships. Innovators form groups based on communication and business practices rather than geographic location. Innovators have control over significant financial resources that absorb lost risk capital. An innovator can cope with the inherently high degree of

uncertainty of the innovation at the time of adoption. An innovator's venturesome spirit is not inhibited by inevitable setbacks associated with early adoption. The innovator plays a large role in the diffusion process as he or she introduces new ideas from outside the boundaries of the social group. However, this individual is not held in high regard by the social group.

*Early adopters* are more integrated within their respective social groups than innovators. Although the peer network of innovators is determined by communication or business practices, early adopter peer networks are influenced more by geography. This adopter has the greatest degree of opinion leadership in most social systems (Rogers 1983). Opinion leadership is the degree to which an individual is able to influence other individuals' attitudes or overt behavior informally, in a desired way, with relative frequency. An early adopter's opinion of a potential innovation is important in others' decisions to adopt. Early adopters have a high degree of social influence and serve as catalysts for the diffusion process. Since early adopters are integrated into their respective social group, members can identify and respect them. Their success and discretion in selecting new ideas maintains role model status and a central position within the social group. Early adopters serve to decrease uncertainty of new ideas and use their interpersonal networks to convey their evaluation to members of their social group. Therefore, early adopters are sought by change agents to speed the diffusion process.

The *early majority* adopts new ideas just before the average member of their social system. Although they interact frequently with their peers, they seldom hold leadership roles. This deliberate group links the innovators and early adopters with the rest of the social group. Their innovation-decision period is longer than that of the innovator and early adopter. Members of this ideal type follow others, but will seldom lead the group.

The *late majority* adopts an innovation after the average member of the social system. Their decision to adopt is largely a function of economic necessity and social pull.

The late majority are skeptical and cautious, adopting an innovation after the rest of the members of the social system have done so. Late majority members can be persuaded on the merits of an innovation, but the pressure of peers is necessary to motivate their adoption. Members of the late majority have comparatively scarce resources, which requires that nearly all of the risk and uncertainty be eliminated before adoption.

Rogers (1983) identified the last group in a social system to adopt an innovation as *laggards*. They use a small frame of reference and are not able to influence other individuals' behavior. While innovators are distanced from the center of the social system for their venturesome adoption of new ideas, laggards are distanced by their inability to accept ideas after they have been proven and supported by system norms. Laggards are guided by a historical, cautious frame of reference. This mindset is largely a function of scarce financial resources that cannot withstand failure of a new innovation. No negative connotations are implied with the nomenclature of this category.

### **Five Attributes of Innovations**

Rogers (1983) identified five characteristics by which an innovation may be described and discussed how individual perceptions of these characteristics predict their rate of adoption. Rogers' five attributes of innovations (pp. 213-232) are relative advantage, compatibility, complexity, trialability, and observability. The producer's perceptions of these attributes influence his or her behavior. The five attributes are defined, followed by a discussion of their application to contract cooperative investment.

*Relative advantage* is the degree to which an innovation is perceived as being better than the idea it supersedes. The nature of the innovation determines whether the specific advantage to adopters is economic profitability or social factors. Market forces undoubtedly are of importance in explaining the rate of adoption in farm innovations (Rogers 1983). Rogers further contends that for some innovations, such as high-cost and

highly profitable ideas, and for some farmers, economic aspects of relative advantage may even be the most important single predictor of rate of adoption.

An important motivation for almost any individual to adopt an innovation is the desire to gain social status. Adoption of an innovation may be a potentially highly profitable and status-conferring decision. However, producers are motivated by different perceived advantages. The relative advantage of an innovation, as perceived by members of a social system, is positively related to its rate of adoption (Rogers 1983).

The second attribute of an innovation, *compatibility*, is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters. First, an innovation can be compatible or incompatible with sociocultural values and beliefs. Second, an innovation can be compatible or incompatible with previously introduced ideas. To illustrate, Peterson (1994) identified the established, successful sugar beet processing cooperatives as an important element in the renewed interest in the contract cooperative business model. Third, an innovation can be compatible or incompatible with client needs for innovations. The extent to which an innovation meets a farmer's felt need influences its rate of adoption. The compatibility of an innovation, as perceived by members of a social system, is positively related to its rate of adoption (Rogers 1983).

Rogers defined the third attribute of an innovation, *complexity*, as the degree to which an innovation is perceived as relatively difficult to understand and use. The complexity of an innovation, as perceived by members of a social system, is negatively related to its rate of adoption (Rogers 1983).

The fourth attribute of an innovation, *trialability*, is the degree to which an innovation may be experimented with on a limited basis. An innovation that is trialable is less uncertain for the adopter. The trialability of an innovation, as perceived by members of a social system, is positively related to its rate of adoption (Rogers 1983).

Rogers defined the fifth attribute of an innovation, *observability*, as the degree to which the results of an innovation are visible to others. The observability of an innovation, as perceived by members of a social system, is positively related to its rate of adoption (Rogers 1983).

An individual producer's perceptions of the five attributes of an innovation influence his or her decision to adopt and predict the rate of adoption. While the receiver's perceptions of an innovation's attributes affect his or her rate of adoption, the receiver's socioeconomic attributes do as well.

### **Five Attributes of Contract Cooperatives**

In addition to the characteristics of the adopter, Rogers (1983) identified attributes of the innovation as the second element in the decision process to adopt an innovation. These attributes are used as a theoretical guide from which to examine the contract cooperative innovation.

The structures in the new contract cooperatives were developed to provide the best means to enable individual producers to increase their farm income through value-added processing of their commodities. Therefore, the relative advantage of investment may include increased income and status as an owner in a new business in the community. Contract cooperative investment may be considered compatible as a result of producer familiarity with traditional cooperatives. The different objectives and structures of contract cooperatives also may be perceived as compatible or incompatible with the sociocultural values and beliefs associated with traditional cooperatives. Investment may also be compatible with the desire for increased farm income.

The prevalence of traditional cooperatives on the Northern Plains also influences the complexity of contract cooperative investment. This potentially lowers the complexity of governance and control issues associated with cooperatives. However, the direct

investment and delivery obligations of the contract cooperatives increase the complexity of adoption for producers who are not familiar with the sugar beet processing cooperatives.

The fourth attribute of an innovation, trialability, is also appropriate to contract cooperative investment. Producers may invest the minimum amount, or substantially more, in a contract cooperative. While this may facilitate trialability, the initial investment may still be a barrier to adoption.

The fifth attribute, observability, may be a reason for the prevalence of contract cooperatives on the Northern Plains as opposed to other regions. Peterson (1994) noted that the success of the sugar beet cooperatives did not go unnoticed by the producers of other crops, especially those who had declined the opportunity to invest (or those who could not come up with) cash dollars to become members of the new sugar cooperatives. In addition, Peterson credited this observability with an investigation of value-added opportunities, particularly for corn production. Furthermore, those producers close to the sugar beet processing regions observed the social and economic benefits of investment in contract cooperatives.

### **Application of the Adoption Diffusion Model**

Fliegel's (1993) review of Adoption Diffusion research focused on production enhancing and conservation technology as positive innovations. The Adoption Diffusion Model has been criticized for a pro-innovation bias. The farm operator is viewed as an actor in a situation influenced by certain structural constraints and by social and cultural circumstances (Fliegel 1993).

The Adoption Diffusion Model assumes that the individual is free to choose and adopt innovations. Fliegel contends that this assumption of the classical model does not adequately acknowledge the consequences of extremely limited resources. This implies that the individual is not free to act.

Producers' goals and needs are part of the organizing process. Fliegel (1993) notes that grower involvement in the technology development process makes it difficult to specify an adoption decision. The farmer's decision does not follow after the design and introduction of a technology, but is part of the process itself (Fliegel 1993).

Using data from 279 producer telephone interviews, Rollins (1993) asked two questions guided by Rogers' Adoption Diffusion Model: 1) How do Pennsylvania farm operators perceive their innovativeness? 2) Which variables (from the adopter categories) most accurately classify Pennsylvania farm operators?

Based on their responses to the Adopter Characteristics Questionnaire, the distribution of 183 producers conformed with Rogers' (1983) adopter categories and distribution. Discriminant analysis was used to identify 15 variables which correctly classified 92 percent of the 183 producers into four adopter categories. No producers fit the innovator category in either of the tests. Rollins' (1993) research on educational programming for farmers confirmed that Rogers' generalizations about innovativeness are still useful to profile categories of adopters among respondents.

Thomas et al. (1990) used Diffusion Theory and Farming Systems Theory to explain the adoption and use of Integrated Pest Management (IPM) technologies by Texas cotton producers. They hypothesized that the producers' backgrounds and informational factors influenced their beliefs about the benefits and adoption of IPM technologies. The producers' beliefs about the five attributes of the IPM innovation, relative advantage, compatibility, complexity, trialability, and observability, were determined in part by their personal characteristics.

Multivariate analyses were conducted on 772 completed telephone interviews with producers from various regions. Producers who had more education and greater gross farm sales and used less irrigation adopted more IPM practices than other producers. While their findings support Rogers' generalization that early adopters are greater risk

takers than late adopters, they identified a need for further research on producers' innovation beliefs.

### **Application to Contract Cooperative Investment**

Fliegel's (1993) review of adoption diffusion research identified elements with unique implications to contract cooperative investment.

First, Fliegel (1993) criticized the Adoption Diffusion Model as having a pro-innovation bias. This examination of the cooperative investment decision does not assume that cooperative membership (investment) is positive. Rather, it views the farmer's decision to invest (adopt) as a rational opportunity. This research views the contract cooperative as an innovation and the producers' decision to invest as the adoption decision.

Second, Fliegel (1993) felt that the Adoption Diffusion Model did not adequately acknowledge the consequences of limited resources in the decision process. Recognizing the institutional efforts to allow lenient financing terms for stock purchases, farmers are considered free to act.

Third, Fliegel (1993) discussed the role and implications of producers' goals and needs in the adoption process. Contract cooperatives attempt to achieve diffusion through appropriate design. That is, the structure, requirements, and potential outcomes of the contract cooperative must meet the producers' motivation to achieve additional margins. Similarly, many of the contract cooperative investors participated in the organization process.

The third element of the theoretical framework, the role of social structure in contract cooperative development, is examined using the concept of closure from Coleman's Social Capital Theory (1988). Do social structures facilitate in the development or adoption of contract cooperatives on the Northern Plains? Social Capital Theory incorporates individual action with social structure, offering a useful framework.

## **Social Capital Theory**

James Coleman (1988) introduced Social Capital Theory as a resource for action. Social Capital Theory was designed to serve as a conceptual extension of Becker's (1975) Human Capital Theory. First, human capital is defined, followed by a discussion of Social Capital Theory and its application.

Human Capital Theory views formal and informal education and training of an individual as a form of capital similar to physical and financial capital. Human capital is an individual's development of knowledge or skills to become more productive (Becker 1975). It serves as the foundation for social capital, and it acknowledges the development of relationships among people that encourage them to be more productive (Coleman 1988).

Social Capital Theory accepts the principle of rational or purposive action and attempts to show how that principle, in conjunction with particular social contexts, can account for the actions of individuals in particular contexts and for the development of social organization (Coleman 1988). Social action is the result of the actor's independent goals and self-interest, shaped and redirected by the social context. This result is a theory that maintains the conception of rational action and superimposes social and institutional organization.

The rational-action element of social capital recognizes that each actor has control over his or her resources and interests. The primary element of social capital is that aspect of social structure which facilitates action and influences actors. Therefore, social capital is a productive force that enables the achievement of certain ends that in its absence would not be possible.

Coleman (1988) used education, a common form of human capital, to examine the role of social capital. He suggested that a child's development depends on the social capital available as much, if not more than, it does on the human capital of parents.

Coleman compared samples of public and private school students and determined that lower dropout rates in Catholic schools were due to common ideas and expectations surrounding students. Coleman identified family and community as a strong support network for students. Norms and expectations are taught and reinforced in this environment with positive outcomes for students. Coleman determined group closure as essential for positive youth development. Therefore, Coleman identified norms as one form of social capital.

A second form of social capital exists in the form of obligations, expectations, and trustworthiness. Closed environments enable actors to support each other through common goals that result in progress. An actor's obligation to his or her community group is socially defined.

A third form of social capital is information. It is important to provide a basis for action (Coleman 1988). An actor's contact with others determines his or her flow of information. Actors use social relationships to acquire the information on which to base decisions. The information flow within closed groups is higher as the strength of the relationships is comparatively higher. Closure enables group action. Action is a balance between self-interest and the needs of other group members. Coleman's Social Capital Theory recognizes the rational economic self-interest of action, but does not view it as denuded of social concern. Coleman incorporates this social concern with the public goods aspect of social capital.

## **Public Goods Aspect of Social Capital**

Just as physical capital and human capital facilitate productive activity, social capital does as well (Coleman 1988). A property shared by most forms of social capital that differentiates it from other forms of capital is its public good aspect. Actors who generate social capital capture only a small part of its benefits, a fact that leads to underinvestment in social capital (Coleman 1988). Property rights of physical capital allow the investor to capture the benefits it produces, which maintains the incentive for investment. Although individuals retain the benefits of human capital investment, social capital potentially benefits all members of a social group. The duration of this capital is affected by the withdrawal of group members, therefore suggesting that social capital is not as static as other forms of capital.

Some forms of social capital have the property that their benefits can be captured by those who invest in them. Consequently, rational actors will not underinvest in this type of social capital (Coleman 1988). Members may devote resources to maintain trust and perpetuate the structure if they continue to reap the benefits.

Coleman developed social capital within the education field where the role of social capital was examined as it contributes to human capital.

## **Application of Social Capital Theory**

Social Capital Theory (Coleman 1988) offers a framework from which to examine social structures that facilitate action and influence actors. This section discusses two applications of social capital in community and economic development research.

In an investigation of factors contributing to the success or failure of community development corporations, Hatlen (1994) hypothesized that community social capital is positively correlated with their success. Hatlen operationalized social capital by the sources and types of assistance received by the community development corporations. In addition, a subjective measure of perceived community support was used. No significant

relationship between the measures of social capital and community development corporation success was identified with correlation analysis. Hatlen noted that the secondary data set may have insufficiently or inappropriately measured social capital.

Similarly, Flora et al. (1995) examined development projects under the premise that social linkages and support networks lower the transaction costs associated with development. They isolated a specific form of social capital, Entrepreneurial Social Infrastructure (ESI), with three distinct categories of influence. They hypothesized that ESI was higher in communities that had experienced a successful economic development project than where there had been no project.

Logistic regression of data from 718 nonmetropolitan communities showed that communities with a successful development project had higher scores on measures of social infrastructure than did those with no successful project.

The positive relationship between ESI and locally initiated development projects suggests that the concept of social capital may contribute to the understanding of the contract cooperative activity on the Northern Plains. Flora et al. (1995) thoroughly operationalized categories of a specific form of social capital, yet specific dimensions of this refined concept did not emerge. Therefore, this research focused on one tenet of social capital, closure.

### **Hypotheses**

The Adoption Diffusion Model (Rogers 1983) views the producer as a decision maker whose rate of adoption and adoption behavior are influenced by personal characteristics and farm organizational characteristics. Rollin's (1993) research confirmed that Rogers' generalizations about innovativeness are still useful to profile categories of adopters. In addition, the Thomas et al. (1990) research on cotton producers supported Rogers' generalization that early adopters are greater risk takers than late adopters. Therefore, the following hypothesis was generated.

H<sub>1</sub>: Contract cooperative members differ in both personal and farm organizational characteristics from the non-members.

(Appendix Table I.1 delineates the expected direction of the independent variables.)

The contract cooperatives' goal of additional margins through processing and marketing commodities differentiates them from the traditional cooperatives. The producers' perceptions of these structural differences and their potential impact on their farm influence their decision to invest. Thomas et al. (1990) suggest that innovation beliefs and structural conditions surrounding adoption need increased attention. Therefore, it is hypothesized that

H<sub>2</sub>: Members have different perceptions and attitudes about contract cooperatives than non-members.

(Appendix Table I.2 delineates the expected direction of the independent variables.)

The objectives of the contract cooperatives are more likely to fit the members' perceptions and perceived roles in the agricultural industry than the non-members' perceptions. Different degrees of closure and different attitudes toward the contract requirements are designed to facilitate trustworthiness. Flora et al. (1995) determined that communities with a successful economic development project had higher scores on measures of social infrastructure than did those with no successful project.

It follows that certain social structures may facilitate the opportunities to invest in contract cooperatives. Similarly, Rogers (1983) generalized that the degree of interconnectedness in a social system is positively related to the rate of adoption of innovations. Coleman identified closure as an essential element for group action. Traditional cooperatives are prevalent on the Northern Plains and offer social benefits to

their members. Therefore, participation in traditional cooperatives is used as a specific, appropriate, and measureable dimension of closure. Therefore, it is hypothesized that

H<sub>3</sub>: Contract cooperative members have higher levels of cooperative participation than non-members.

(Appendix Table I.3 delineates the expected direction of the independent variables.)

## **CHAPTER 3. METHODOLOGY**

This chapter discusses the methods used to test the hypotheses guided by the Adoption Diffusion Model and Social Capital theory. Telephone interviews and follow-up mail-out/mail-back questionnaires were used. First, the sampling procedures and response rates are discussed for the member and non-member groups. Second, instrument pretesting and survey procedures are discussed. Third, the measures used in the study and their operationalization are organized under the three hypotheses.

### **Sample**

Over 40 cooperatives have been proposed or developed on the Northern Plains since 1991, representing a potential \$2 billion dollars in initial investment (Egerstrom, 1994). This study sought to identify the differences between those who invest in the contract cooperatives and those who do not. The member population universe consisted of the memberships of incorporated and operating contract cooperatives that used public equity drives to capitalize the business. Four contract cooperative memberships were targeted for the study. They process milk, bison, corn, and wheat for their North Dakota members. The non-member sample universe consisted of producers of milk, bison, corn, or wheat who could have invested in a respective contract cooperative, but did not do so.

### **Overall Sample**

Eight producer lists were compiled (members and non-members for each group) for the population universe. Various sources were used to develop the member and non-member sample frames. The sampling frames were derived from simple random, stratified random, and censuses of the available lists. Table 3.1 shows the member sample frame size and sample size. Table 3.2 shows the non-member sample frame size and sample size.

Table 3.1. Member Sample Frame Size and Sample Size

Commodity Type	Number of Individual Members in the Cooperative	Number of Individuals in the Sample
Milk	63	55
Wheat	298	109
Corn	707	301
Bison	119	110
Total	1,187	575

\*Stratified random sample by county.

Table 3.2. Non-member Sample Frame Size and Sample Size

Commodity Type	Number of Individuals in the Non-Member Sample Frame	Number of Individuals in the Sample
Milk	297	112
Wheat	548	257
Corn	477	210
Bison	13	13
Total	1,335	592

\*Stratified random sample by county.

A total of 300 completed member cases was sought from the 1,187 producers in the member sample frame to achieve a 95 percent confidence level for the member group (Table 3.1). A total of 300 completed cases was sought from the 1,335 producers in the non-member sample frame to achieve a 95 percent confidence level for the non-member group (Table 3.2). Anticipating an 80 percent response rate for the telephone interview, a weighted simple random sample from the four member groups was selected. However, due to low initial response rates, the telephone research firm requested as many names as possible to complete the interviews more quickly. Therefore, as shown in Tables 3.1 and

3.2, all of the remaining names with valid phone numbers were provided for the milk and bison member and non-member groups.

### **Milk Cooperative Members and Non-members**

The managers of the milk processing cooperative provided a list of 63 members, of which 55 with valid phone numbers were included in the member sample. In addition, the milk processing cooperative provided a list of 297 area milk producers who were viewed as potential members. A simple random sample of 112 milk producers was selected from the list of 297 for the non-member milk producer sample.

### **Wheat Cooperative Members and Non-members**

The wheat member sampling frame was developed from a list of 298 durum wheat producers. Producers were from the seven top durum wheat producing counties in North Dakota (North Dakota Agricultural Statistics Service, 1995) are shown in Table 3.3. The stratified random sample of wheat members is shown in Table 3.3. For the non-member wheat group, the North Dakota Wheat Commission provided a random sample of 548 wheat producers in the eight counties from which the member wheat producer sample frame was developed. The stratified random sample of non-member wheat producers is also shown in Table 3.3.

Table 3.3. Stratified Random Samples of the Wheat Member and Non-member Groups by County

Selected Counties	Members of Wheat Co-op*		Non-mbrs of Wheat Co-op**	
	N	Sample	N	Sample
Divide	1	1	59	30
Mountrail	16	7	85	36
Ward	56	25	74	36
Bottineau	25	13	82	35
Towner	53	26	44	27
Benson	31	13	82	37
McLean	20	9	90	36
Foster	96	15	32	20
Total	298	109	548	257

\*Names obtained from North Dakota Wheat Commission, questionnaire screening, and miscellaneous sources.

\*\*Names obtained from North Dakota Wheat Commission.

### Corn Cooperative Members and Non-members

The managers of the corn processing cooperative provided a list of its members. First, non-North Dakota producers were eliminated; second, producers were numbered by county. Producers were selected from the seven top corn producing counties in North Dakota (North Dakota Agricultural Statistics 1995). Table 3.4 shows the number of corn members in the seven selected counties. A stratified random sample was conducted on the 707 names, yielding a sample of 301 corn members. The North Dakota Corn Growers Association provided a random sample of 477 corn producers from the seven counties listed in Table 3.4. Members in the corn cooperative were eliminated from the non-

member list. A stratified random sample was conducted yielding a non-member sample frame of 210 producers (Table 3.4).

Table 3.4. Stratified Random Samples of the Corn Member and Non-member Groups by County

Selected Counties	Members of Corn Co-op*		Non-mbrs of Corn Co-op**	
	N	Sample	N	Sample
Traill	135	64	31	18
Cass	182	79	62	31
LaMoure	15	11	14	12
Ransom	35	19	41	24
Dickey	26	15	85	27
Sargent	32	17	65	25
Richland	282	96	179	73
Total	707	301	477	210

\*Names obtained from corn cooperative.

\*\*Names obtained from North Dakota Corn Growers Association.

## **Bison Cooperative Members and Non-members**

The managers of the bison processing cooperative provided a list of 119 members, of which 110 with valid phone numbers were included in the member sample. In addition, the managers of the bison processing cooperative provided a list of 13 producers who were identified as potential members. All 13 were used in the non-member sampling frame. Response rates for the telephone interview and mail-out/mail-back questionnaires for the member and non-member groups follow.

### **Response Rates**

Of the 1,167 contract cooperative members and non-members contacted, 553 (47.4 percent) completed the telephone interview. The telephone interview response rates for the member and non-member groups were 55.8 percent and 39.2 percent, respectively. Of the 553 mail-out/mail-back questionnaires sent to the contract cooperative members and non-members, 318 (57.5 percent) returned the survey. Of the 1,167 total producers, 318 (27.2 percent) completed both the telephone interview and the mail-out/mail-back questionnaire.

Table 3.5 delineates the telephone interview and mail-out/mail-back response rates for the four member groups. Of the 55 milk members, 36 (65.5 percent) completed the telephone interview, of which 22 (61.1 percent) returned the mail-out/mail-back questionnaire. Of the 109 wheat members, 68 (62.4 percent) completed the telephone interview, of which 42 (61.8 percent) returned the mail-out/mail-back questionnaire. Of the 301 corn members, 171 (56.8 percent) completed the telephone interview, of which 101 (59.1 percent) returned the mail-out/mail-back questionnaire. Of the 110 bison members, 46 (41.8 percent) completed the telephone interview, of which 26 (54.4 percent) returned the mail-out/mail-back questionnaire (see Table 3.5).

Table 3.5. Member Group Response Rates for the Telephone and Mail-out/Mail-back Survey Instruments

Member Groups	Telephone Interview			Mail-out/Mail-back		
	N	Completed Interviews	Response Rate (%)	N	Returned Surveys	Response Rate (%)
Milk	55	36	65.5	36	22	61.1
Wheat	109	68	62.4	68	42	61.8
Corn	301	171	56.8	171	101	59.1
Bison	110	46	41.8	46	26	54.4
Total	575	321	55.8	321	191	59.5

Table 3.6 delineates the telephone interview and mail-out/mail-back questionnaire response rates for the four non-member groups. Of the 112 milk non-members, 44 (39.3 percent) completed the telephone interview, of which 22 (50.0 percent) returned the mail-out/mail-back questionnaire. Of the 257 wheat non-members, 70 (27.2 percent) completed the telephone interview, of which 33 (47.1 percent) returned the mail-out/mail-back questionnaire. Of the 210 corn non-members, 112 (53.3 percent) completed the telephone interview, of which 67 (59.8 percent) returned the mail-out/mail-back questionnaire. Of the 13 bison non-members, six (46.6 percent) completed the telephone interview, of which five returned the mail-out/mail-back questionnaire (Table 3.6).

Table 3.6. Non-member Group Response Rates for the Telephone Interview and Mail-out/Mail-back Survey Instruments

Non-Member Groups	Telephone Interview			Mail-out/Mail-back		
	N	Completed Interviews	Response Rate (%)	N	Returned Surveys	Response Rate (%)
Milk	112	44	39.3	44	22	50.0
Wheat	257	70	27.2	70	33	47.1
Corn	210	112	53.3	112	67	59.8
Bison	13	6	46.6	6	5	83.3
Total	592	232	39.2	232	127	54.8

Member and non-member producers who completed the telephone interview, but did not return the mail-out/mail-back questionnaire, were included in the analysis. Members who did not indicate which cooperative they were members of or who invested in a different (not one of the four memberships) contract cooperative were excluded from the analysis. The four non-member groups were combined to form the Non-member group for analysis.

Table 3.7 delineates the number and percent of the 505 total cases represented by the five remaining groups.

The four member groups shown in Table 3.7 were combined into two member groups for analysis. The members in the corn and wheat contract cooperatives were combined into the Crop group (N = 230), and the members in the milk and bison contract cooperatives were combined into the Livestock group (N = 85). Table 3.8 shows the number and percent of the total cases for the Non-member, Crop, and Livestock groups.

Table 3.7. Number of Producers and Percent of the Total Respondents in the Five Groups

Group	N	%
Non-member	190	37.6
Milk	37	7.3
Wheat	66	13.1
Corn	164	32.5
Bison	48	9.5
Total	505	100

Table 3.8. Number of Producers and Percent of the Total Respondents in the Dependent Variable Groups

Group	N	%
Non-member	190	37.6
Crop	230	45.6
Livestock	85	16.8
Total	505	100

### **Instrument Pretesting**

The telephone interview instrument was pretested the afternoon of February 22, 1996. The interview required an average of 15 minutes to complete, and no major changes were necessary. Sensitive financial information and cooperative participation were addressed in the telephone interview. A cross check for producer income was added at the suggestion of the survey research specialist.

The mail-out/mail-back questionnaires were pretested the morning of February 23, 1996, at the Prosper Farmers Elevator. Two producers completed the member instrument (Appendix F, Form A); they were members of American Crystal Sugar and Golden Growers contract cooperatives. The completion times were 10 and 13 minutes. The producers noted that the scale directions for two consecutive Likert scale questions (29 and 30 Form A) were reversed. This was the only change made before printing the instrument. Four producers completed the non-member instrument (Appendix G, Form B). Completion times ranged from four to nine minutes. No changes were made to this instrument.

### **Procedures**

North Dakota producers included in the sample could potentially be contacted five times during the research process. This section delineates the three-stage, mail-out/mail-back design as implemented with the completed telephone interviews. The research design followed the Dillman Total Design Method (Dillman 1978).

Producers were first notified of the study with a letter from the Quentin Burdick Center for Cooperatives at NDSU sent on March 1, 1996 (Appendix A). In addition, two of the four member groups received a letter of support from their contract cooperative.

The second contact was the telephone interview (Appendix E) conducted March 8, 1996, through April 5, 1996. Teleforce Incorporated, a Fargo telephone market research firm, conducted the interviews. The survey research specialist stopped the interview process at 533 completions due to an exhausted phone list. Completed personal interviews (CPIs) were recorded on eight separate master lists to monitor progress and maintain the mailing lists for subsequent contacts. Data from the 533 completed interviews were entered into the *SPSS for Windows* program and returned with a printout of variable frequencies.

Producers who completed the telephone interview were contacted a third time. This contact included a letter explaining the second instrument, the appropriate mail-out/mail-back questionnaire, and a return envelope. The study design employed two mail-out/mail-back instruments to address members and non-members. The member instrument contained 30 questions, compared to 13 in the non-member instrument. Both the telephone interview and mail-out/mail-back instruments assessed producer attitudes toward the contract cooperatives (Appendixes E, F, and G).

Code numbers were written on the front cover to enable correlation of the telephone interview and mail-out/mail-back questionnaire data sets of each respondent. Based on the weekly lists of completed personal interviews, six groups of surveys were sent from March 14, 1996, through April 8, 1996 (Table H.1).

The fourth contact, a reminder postcard was mailed one week after the surveys were sent (Appendix C). The identification codes were used to eliminate the addresses of those who returned the survey from the postcard mailing lists.

The final contact, a letter of explaining the importance of the study, was sent two weeks after the first survey was sent. A second coded survey and return envelope were included (Appendix D).

Response rates were recorded daily for the member and non-member mail-out/mail-back questionnaires. Daily responses for the member mail-out/mail-back questionnaire (Form A) are shown in Table H.2. Daily responses for the non-member mail-out/mail back questionnaire (Form B) are shown in Table H.3. Survey coding enabled the specific cooperative groups to be maintained throughout analysis. This was designed to enable analysis of the individual groups at the 90 percent confidence interval.

### **Dependent Variable Operationalization**

Two methods were used to determine which farmers were members of contract cooperatives. First, the managers of four contract cooperatives were asked to provide lists

of their members. Three cooperatives provided the names and addresses of their membership. In addition, two cooperatives provided names and addresses of area producers who were potential members of their contract cooperatives. These were included in the non-member sampling universe.

Second, telephone interview respondents reported their memberships in specific contract cooperatives. An item was included on the member (Form A) mail-out/mail-back questionnaire as a cross check on reported memberships. Of the 359 members who completed the telephone interview and/or the mail-out/mail-back questionnaire, 44 did not specify what contract cooperative they invested in and therefore were excluded from the analysis. The remaining members (those whose memberships were specified) were segmented into investors in crop processing cooperatives (Crop group) and investors in livestock processing cooperatives (Livestock Group).

## **Screening**

As this was the first effort to describe the memberships of contract cooperatives, telephone interview respondents who were on a membership list were not screened to prevent inadvertently excluding members. Interviewers screened the non-member sample respondents using the following three questions: 1) Are you currently operating a farm or ranch? 2) Did you sell at least \$10,000 in farm products in 1995? 3) Do you consider farming or ranching your main occupation? Given the investment potential of the contract cooperatives, as compared to supply or service cooperatives, screening known investors may have influenced the producer base upon which the new memberships were described and compared with the non-member producer base.

## **Independent Variable Operationalization**

This section details the operationalization of the variables used to test the general hypotheses. Variables are organized under their respective hypotheses.

H<sub>1</sub>: Contract cooperative members differ in both personal and farm organizational characteristics from the non-members.

### **Personal Characteristics**

Telephone interview respondents were asked to report the following personal characteristics: 1) the number of years they have been a farm operator (i.e., personally at financial risk); 2) the number of years before they expect to retire; 3) gender (without asking for gender directly); 4) age (open-ended); 5) whether they were single, married, widowed, or divorced; and 6) highest educational level using the following categories: less than a high school degree, high school degree or diploma, some college, college degree, and/or graduate degree.

### **Farm Characteristics**

The three categories of farm characteristics that were measured in the telephone interview were farm size, crop and livestock production, and financial attributes. All three categories were operationalized in the telephone interview survey instrument.

**Farm Size.** Farm size was measured from respondents' answers to the following questions: 1) How many acres did you own in 1995? 2) How many acres did you rent in 1995? and 3) How many acres did you rent out in 1995? The number of acres rented out was subtracted from the total acres respondents owned and rented to obtain the total farm size. **Financial Characteristics.** Respondents were asked to provide seven financial measures from their 1995 farm operations. Farmers were prepared for this request in a letter sent one week before the telephone interview. The letter asked that they have their 1995 1040F income tax form available. Of the seven financial measures, four came directly from the respondents' 1040F tax forms.

Farmers reported their gross farm income from line 11 of these forms. Total farm expenses were reported from line 35. Total distributions received from cooperatives in 1995 were reported from line 5A of the 1995 tax forms. Respondents' total interest expense in 1995 was calculated by adding lines 23A and line 23B.

Respondents were asked to approximate the value of their farm assets (excluding assets of other businesses) as of January 1, 1995. In addition, respondents were asked to approximate the value of their farm liabilities as of January 1, 1995.

Respondents were also asked to report the combined value (farm-operator and spouse) of off-the-farm income earned in 1995. The final question on the telephone interview addressed total family income. Respondents were asked to indicate their approximate family income after the following ordinal scale was read: 1 = Less than \$10,000 (or negative number); 2 = \$10,000 to \$19,000; 3 = \$20,000 to \$29,000; 4 = \$30,000 to \$39,000; 5 = \$40,000 TO \$49,000; 6 = \$50,000 to \$59,000; 7 = \$60,000 to \$69,000; and 8 = \$70,000 or more.

**Crop Production Practices.** First, respondents were asked if they grew crops in 1995. If yes, interviewers asked respondents what crops were grown in 1995 and how many acres of each were raised. Responses were recorded using a list of 16 crops, including alfalfa, barley, corn, soybeans, sunflowers, and wheat (durum and spring). The complete list is shown on the telephone interview questionnaire (Appendix E).

Interviewers asked crop producers if they planned to increase the acreage of one of their current crops within the next five years (yes, no, unsure). If they answered “yes,” they were asked 1) What crop(s) will you increase? 2) Is this increase because of a new co-op investment?

Interviewers also asked crop producers if they planned to add another type of crop within the next five years (yes, no, unsure). If they responded “yes,” they were asked 1) What crop(s) will you add? 2) Is this addition because of a new co-op investment?

**Livestock Production Practices.** Respondents were asked if they produced livestock in 1995. If they indicated that they produced livestock, interviewers asked respondents to report what types of livestock enterprises they had on their farm in 1995 and how many head of each type were raised.

Responses were recorded using a list of six likely livestock enterprises, including beef cattle, dairy cattle, bison, and poultry. The complete list is shown in the telephone interview questionnaire (Appendix E).

Interviewers asked the livestock producers if they planned to increase the number of head in of their current livestock enterprises with in the next five years (yes, no, unsure). If they answered “yes,” they were asked 1) What livestock enterprise(s) will you increase? 2) Is this increase because of a new co-op investment?

Interviewers also asked livestock producers if they planned to add another type of livestock enterprise within the next five years. If “yes,” they were asked: 1) What livestock enterprise(s) will you add? 2) Is this increase because of a new co-op investment?

H<sub>2</sub>: Members have different perceptions and attitudes about contract cooperatives than non-members.

To ascertain the differences between the attitudes of the non-members and members, seven Likert scale question sets were administered in the survey instruments. The telephone interview included four of these sets, and the mail-out/mail-back instruments contained three of these sets.

### **Future of Farm Business**

In addition to the six personal characteristics addressed in the telephone interview, respondents were asked about the future of their farm businesses. Respondents were asked (yes, no, unsure) if one of their sons, daughters, or other family members would like to take over the farm when they stop farming.

### **Perceived Role in Food Industry**

To address the potentially different mindsets of contract cooperative members and non-members, respondents were asked to indicate their perceived role in six segments of the food industry (Appendix E). The selected segments in the statement “I’m in the food business” were production, processing, transportation, marketing, wholesale, and retail. A five-point Likert scale with end points of “strongly agree” and “strongly disagree” were provided with each statement.

### **Time Spent on Agricultural Roles**

The contract cooperatives target increased margins through processing and marketing their commodities. On the telephone instrument, members and non-members were asked to indicate whether the time they spend on six selected agricultural segments would increase, stay the same, or decrease over the next five years. The agricultural segments were production, processing, transportation, marketing, wholesale, and retail (Appendix E).

### **Accomplish Selected Objectives**

On the telephone interview instrument, interviewers asked members and non-members to rate how often they believed that the new cooperatives would accomplish nine selected objectives. Five-point Likert scales with end points of “very often” and “almost never” were provided with each of the following objectives: 1) increase farm income, 2) reduce risk associated with marketing, 3) gain access to value-added markets, 4) network with people with similar interests, 5) increase knowledge/information base, 6) provide new services to farmers in the community, 7) increase farm productivity, 8) have a consistent outlet to market products, and 9) purchase shares at a low price now and sell them for a higher price later (Appendix E).

### **Ideologies Toward Contract Cooperatives**

The delivery contracts, financing, and governance of the new, value-adding contract cooperatives differentiate them from traditional cooperatives. To ascertain the varying attitudes about the new contract cooperatives, eight statements were read to the member and non-member respondents in the telephone interview (Appendix E). Likert scales with end points of “strongly agree” and “strongly disagree” were provided with each of the following statements: 1) Required investments are too high. 2) These co-ops benefit only the wealthy producers. 3) These co-ops’ delivery contracts are too strict. 4) Farmers should not own food companies. 5) These co-ops are get-rich-quick schemes. 6) Farmers use these co-ops as last-ditch efforts to survive financially. 7) These co-ops cannot compete with investor-oriented firms. 8) These co-ops’ managers have too much control. 9) These co-ops offer inferior quality products.

### **Important Investment Considerations**

On the mail-out/mail-back questionnaires, members and non-members (Form A and Form B, respectively) were asked to rate the level of importance they placed on 11 selected items when considering an investment in any new, value-adding contract

cooperative (Appendixes F and G). Five-point Likert scales with endpoints of “very important” and “very unimportant” were provided with each of the following items: 1) intended location of the production plant, 2) professional feasibility study results, 3) marketing plan, 4) media coverage, 5) offering circular or prospectus, 6) my concerns about level of risk, 7) potential to make a profit, 8) membership conditions or qualifications, 9) initial cost of the investment, 10) members of the board or planning committee, and 11) have a stable market outlet.

### **Long-term Risk and Return of Cooperative Stock**

Members and non-members compared the long-term return and risk of cooperative stock investment with alternative investments on their respective mail-out/mail-back questionnaires (Appendices F and G). In separate questions, farmers were asked how they thought the new cooperatives compared with investment alternatives in 1) their long-term return on investment and 2) their long-term risk of investment. Five-point Likert scales with end points of “much higher” and “much lower” were provided to compare cooperative stock with six investment alternatives. The selected alternatives were 1) stocks, 2) bonds, 3) mutual funds, 4) certificates of deposit, 5) land, and 6) other farm enterprises.

### **Reduction in Long-term Marketing Risk**

The member's ability to maintain control of his or her commodity through the processing and marketing stages has the potential to lower the producer's long-term marketing risk. On the mail-out/mail-back questionnaires, members and non-members were asked (Form A and Form B, respectively) to rate the degree to which investment in a new, value-added contract cooperative lowers long-term marketing risk. Responses were indicated on a five-point Likert scale with end points of “very large degree” and “not at all.”

H<sub>3</sub>: Contract cooperative members have higher levels of cooperative participation than non-members.

## **Cooperative Participation**

Three measures were used in the telephone interview to measure the respondents' participation in agricultural cooperatives. First, respondents were asked to report the number of their memberships in four types of agricultural cooperatives. The type of cooperative and parenthetical examples were supply (e.g., CENEX, Double Circle), commodity marketing (e.g., Prosper Farmers Elevator, GTA), service (e.g., Farm Credit Services, REC, RTC), and sugar beet processor (e.g., MinnDak, American Crystal Sugar). Second, respondents indicated whether they were board members or other officers at that time or if they had ever been one for each of the four categories of cooperatives. Third, respondents reported the number of meetings they attended yearly for each of the four categories of cooperatives.

## **Methodological Concerns**

Peterson (1994) notes that the contract cooperatives are referred to as "new wave," "new generation," or "closed cooperatives." This terminology causes confusion in the operationalization of past cooperative involvement in the survey. Three categories were specified, and examples of each were given by the interviewer. They were 1) traditional cooperatives (supply, service, marketing) such as CENEX, Farm Credit Services, and Prosper Farmers Elevator; 2) closed cooperatives formed before 1985 (processing and marketing) such as American Crystal Sugar and Minnesota Corn Processors; and 3) new closed cooperatives formed since 1991 (processing and marketing) such as Dakota Growers Pasta Company and North American Bison Cooperative.

Producers included in the non-investor sample frame must have had an opportunity to join a new cooperative. For example, a wheat farmer would not provide useful data on why he or she did not join a dairy marketing cooperative. The member sample frame represents four commodity marketing groups from different regions of North Dakota.

Differences in farm size due to region and commodity must be recognized. Members and non-members in a certain commodity and region will be more comparable. Therefore, it is appropriate to compare the combined members (of the four cooperatives) to the non-members.

The member survey also addressed a second research question pertaining to the areas of dissatisfaction and confusion resulting from membership. The member mail-out/mail-back survey (Appendix F) contained 30 questions, compared to 13 for the non-investors (Appendix G). The additional questions could have influenced the response rate for this group. This may have been offset by the preliminary notification letter and telephone interview. Two of the four cooperatives agreed to endorse this project with a letter sent with the North Dakota State University letter. This was recognized as a potential influence on response rates for part of the sample.

A final concern demonstrates the perceived value of contract cooperative stock as compared to symbolic membership in traditional cooperatives. Producers invested in stock for the farm corporation, trust funds, offspring, partnerships, and several other combinations. The "member" may be an agreement, a retired farmer residing out of state, or a 12 year old. Therefore, the member selected by the simple random sample may not have been able to provide useful data. This concern was addressed by the notification letter and the interviewer verification during the telephone interview.

### **Statistical Analysis**

Rogers' Adoption Diffusion Model (1983) and Coleman's Social Capital Theory (1988) suggest that members of contract cooperatives will differ from non-members. Dividing the members into the Crop and Livestock groups allows for more thorough analysis and more specific use of the research.

Univariate frequencies and three types of statistical tests were used to analyze the non-member, crop, and livestock data. All statistical analyses were conducted with an alpha level of .05.

Ordinal-level data from the Likert questions was treated as interval-level data for this analysis. This assumption implies a known, equal distance or interval between the categories. While the Likert values were treated as interval, the truncated data set (range of 1 to 5) may influence the significance values in the analysis of variance (ANOVA) models.

One-way analysis of variance was used to compare the means among the three groups. To test population variances, the F-statistic is computed by dividing the among-groups' mean square by the within-groups' mean square. The F-statistic and its observed significance level (p) are reported for each of the ANOVAs. All cases with valid data were used in the statistic for that variable. The number of respondents (N) of the largest group responding is reported in sets of ANOVA tables rather than the number of respondents for each independent variable. Individual group means are reported for each of the ANOVAs. To determine which categories (group) of the factor variable differ significantly from other categories, a Duncan's Multiple Range post hoc t-test for pairwise comparisons was done for each of the significant ANOVAs. Significant differences among the non-member, crop, and livestock groups are reported as follows:

- a = difference between Non-member and Crop member
- b = difference between Non-member and Livestock member
- c = difference between Crop member and Livestock member

ANOVAs were used to test the differences in crop and livestock production (acres and number of head). The number of producers in each group who raised specific crops and livestock was not tested.

The cross-tabulation statistic was used for dichotomous, nominal-level independent variables. The Chi-square value and p are reported. The Phi-coefficient, which indicates

the strength or level of association, is also reported for significant tests. The degrees of freedom, which refers to the possibilities for variation within a statistical model, are not reported. For a Chi-square, the degrees of freedom are computed by multiplying the number of rows minus one times the number of columns minus one.

Specific independent variables operationalized only in the member (Form A) or the non-member (Form B) mail-out/mail-back questionnaires required additional statistics. An independent samples t-test statistic, which compares the means of two groups, was used to analyze the crop and livestock group's Likert responses to the reasons for investing in a contract cooperative. Univariate frequency data are reported for the non-member group's Likert responses to selected reasons for not investing in a contract cooperative.

While segmenting the members into two groups enables the ANOVA statistic to determine which member groups account for statistical significance, the group Ns for certain variables are low. The low Ns may influence the ANOVA significance values.

This section reports the findings of the study. Independent variable findings are organized under the three general hypotheses. Summary tables of the specific variables and their significance for the three hypotheses are included in Tables I.1, I.2, and I.3. Analysis of the dependent variable (investor or non-investor) using the interview and mail-out/mail-back data resulted in 190 Non-members, 230 Crop members, and 85 Livestock members as shown in Table 3.8. Independent variable Ns varied, as not all producers completed every question. Study findings are reported under the three general hypotheses.

H<sub>1</sub>: Contract Cooperative Members Differ in Both Personal and Farm Organizational Characteristics From the Non-members.

### **Personal Characteristics**

Producers in the Non-member group reported having farmed for 25.4 years. This was significant ( $F=7.27$ ;  $p=.001$ ) from the Crop group (21.9 years) and Livestock group (20.0 years). The average age of producers in the Non-member group was 47.6 years, whereas the average ages of Crop and Livestock groups were 44.2 years and 44.2 years, respectively. The average age of the Non-member group was significant from both the Crop and Livestock investor groups ( $F=5.17$ ;  $p=.006$ ).

Respondents were asked to report the number of years they would farm before retirement. There was no significant difference among the Non-member, Crop, and Livestock groups ( $F=1.42$ ;  $p=.241$ ). The average number of years the Non-member, Crop, and Livestock groups expected to farm before retirement was 17.0, 18.9, and 17.4 years, respectively (Table 4.1).

Table 4.1. Selected Personal Characteristics for the Non-member, Crop, and Livestock Groups

Selected Variables	Non-mbr	Crop-mbr	Lvstk-mbr	F	p
Years been a farmer	25.4	21.9	20.0	7.27	.001 <sup>a,b</sup>
Age in years	47.6	44.2	44.2	5.17	.006 <sup>a,b</sup>
Years before retirement	17.0	18.9	17.4	1.42	.241
N	174	230	85		

<sup>a</sup> = difference between Non-member and Crop member.

<sup>b</sup> = difference between Non-member and Livestock member.

### Education Levels

Producers were asked to report their highest level of education using five categories (1 = less than a high school degree and 5 = graduate degree). There was a significant difference in the education levels among the three groups ( $\chi^2=47.54$ ;  $p=.000$ ;  $df=3$ ). Of the 174 producers in the Non-member group, 7.5 percent reported an education level of less than a high school degree, compared with 1.3 percent of the Crop producers and 4.8 percent of the Livestock producers. Over 36 percent of the producers in the Non-member group reported having earned a high school degree, compared to 19.1 percent of the Crop producers and 42.9 percent of the Livestock producers. The number of producers in the Non-member, Crop, and Livestock groups who reported some college education was 38.5 percent, 38.7 percent, and 32.1 percent, respectively. Over 31 percent of the Crop producers reported earning a college degree, compared to 13.2 percent of the Non-member producers and 14.3 percent of the Livestock producers. This difference reflected the lower number of Crop producers whose highest education level was a high school degree. It follows that a higher number of Crop producers would have reported earning a graduate degree. Over 9 percent of the Crop producers reported earning a

graduate degree, compared to 4.6 percent of the Non-member producers and 6.0 percent of the Livestock producers (Table 4.2).

Table 4.2. Education Levels for the Non-member, Crop, and Livestock Groups

Education Level	Non-member		Crop-member		Livestock-mbr		Statistics
	N	%	N	%	N	%	
Some high school	13	7.5	3	1.3	4	4.8	$\chi^2 = 47.54$ $p = .000$ $df = 8$ $= .30$
High school degree	63	36.2	44	19.1	36	42.9	
Some college	67	38.5	89	38.7	27	32.1	
College degree	23	13.2	73	31.7	12	14.3	
Graduate degree	8	4.6	21	9.1	5	6.0	
N	174	100	230	99.9	84	100.1	

### Farm Organizational Characteristics

#### Farm Size

There was no significant difference among the number of acres owned by producers in the Non-member, Crop, and Livestock groups in 1995 ( $F=.77$ ;  $p=.463$ ). Average acres owned by the three groups were Non-member, 955.60 acres; Crop, 1,107.20 acres; and Livestock, 898.60 acres. Similarly, there was no significant difference among the three groups regarding the number of acres rented out ( $F=2.68$ ;  $p=.070$ ). The Non-member, Crop, and Livestock groups rented out 58.99, 53.12, and 157.40 acres, respectively, in 1995. However, producers in the Crop group rented more land (1,264.80 acres) than the Non-member group (848.40 acres) and Livestock group (788.80 acres). The difference in rented acres was significant between the Crop and Non-member groups

as well as between the Crop and Livestock groups ( $F=11.18$ ;  $p=.000$ ). Total operation size was significant ( $F=3.14$ ;  $p=.044$ ) between the Crop group (2,139.80 acres) and Non-member group (1,731.20 acres). Producers in the Livestock group reported an average total operation size of 1,738.60 acres (Table 4.3).

Table 4.3. Average Farm Size (in acres) for the Non-member, Crop, and Livestock Groups

Selected Variables	Non-mbr	Crop-mbr	Lvstk-mbr	F	p
Acres owned	955.60	1107.20	898.60	0.77	.463
Acres rented	848.40	1264.80	788.80	11.18	.000 <sup>a,c</sup>
Acres rented out	58.99	53.12	157.40	2.68	.070
Total operation size	1731.20	2139.80	1738.60	3.14	.044 <sup>a</sup>
N	173	229	85		

<sup>a</sup> = difference between Non-member and Crop member.

<sup>c</sup> = difference between Crop member and Livestock member.

### Farm Financial Characteristics

Respondents were asked to report eight financial items from their 1995 1040F tax forms (Table 4.4). The average farm operation gross incomes (not personal household income) for the three groups were Non-member, \$183,338; Crop, \$293,342; and Livestock, \$160,554. Producers in the Crop group reported significantly higher gross farm income than did the Non-member and Livestock groups ( $F=24.38$ ;  $p=.000$ ). The Non-member, Crop, and Livestock groups reported total farm expenses of \$158,618; \$233,150; and \$134,712, respectively. Producers in the Crop group reported higher total farm expenses than did producers in the Non-member and Livestock groups ( $F=15.92$ ;  $p=.000$ ).

Table 4.4. Selected Financial Characteristics for the Non-member, Crop, and Livestock Groups (in dollars)

Selected Characteristics	Non-mbr	Crop-mbr	Lvstk-mbr	F	p
Gross farm income	183,338	293,342	160,554	24.38	.000 <sup>a,c</sup>
Expenses	158,618	233,150	134,712	15.92	.000 <sup>a,c</sup>
Co-op distribution	10,734	19,959	18,769	.84	.434
Interest expense	32,330	27,330	21,998	.52	.582
Assets	535,690	940,209	627,972	11.12	.000 <sup>a,c</sup>
Liabilities	161,706	248,514	149,288	6.26	.002 <sup>a,c</sup>
Off-farm income	11,983	17,376	17,144	1.37	.256
Family income*	4.32	5.62	4.86	14.75	.000 <sup>a,c</sup>
N	153	194	76		

<sup>a</sup> = difference between Non-member and Crop member.

<sup>c</sup> = difference between Crop member and Livestock member.

\*Family income based on ordinal scale

The Non-member, Crop, and Livestock groups reported 1995 interest expenses of \$32,330, \$27,330, and \$21,998, respectively. There was no significant difference in interest expenses among the three groups ( $F=.52$ ;  $p=.582$ ). The Non-member, Crop, and Livestock groups reported 1995 cooperative distributions of \$10,734, \$19,959, and \$18,769, respectively. There was no significant difference in average cooperative distributions among the three groups ( $F=.84$ ;  $p=.434$ ).

Average total assets of \$535,690, \$940,209, and \$627,972 were reported by the Non-member, Crop, and Livestock groups, respectively. The average total assets of producers in the Crop group were significantly higher than the average total assets of the Non-member and Livestock groups ( $F=11.12$ ;  $p=.000$ ). Similarly, the average total liabilities of producers in the Crop group were significantly higher than those of the Non-member and Livestock groups ( $F=6.26$ ;  $p=.002$ ). The Non-member, Crop, and Livestock

groups reported average total liabilities of \$161,706, \$248,514, and \$149,288, respectively. Average off-farm income for the Non-member (\$11,983), Crop (\$17,376), and Livestock (\$17,144) groups was not significant ( $F=1.37$ ;  $p=.256$ ).

Total family income was measured by an eight-point ordinal scale using ranges of \$10,000. The Non-member group reported an average value of 4.32, which indicated total family income of \$30,000 to \$39,000; the Crop group reported an average value of 5.62, which indicated total family income of \$40,000 to \$49,000; the Livestock group reported an average value of 4.86, which indicated higher income than the Non-member group, but in the same range of \$30,000 to \$39,000. The average family income of the Crop group differed significantly from the Non-member and Livestock groups ( $F=14.75$ ;  $p=.000$ ) (Table 4.4).

### **Crop and Livestock Production Practices**

To address potential management and production changes resulting from investment in a contract cooperative, crop and livestock production information was collected from the respondents. In addition, the respondent's decision to increase and/or add crops and livestock to the operation was collected.

#### **Crop Production Practices**

Of the 174 producers in the Non-member group, 97.7 percent raised crops in 1995; of the 230 producers in the Crop group, 99.6 percent raised crops in 1995; and of the 85 producers in the Livestock group, 87.1 percent raised crops in 1995. The cross-tabulation analysis showed a significant difference ( $\chi^2=31.47$ ;  $p=.0000$ ;  $\alpha=.25$ ) (Table 4.5).

Table 4.5. Number of Non-member, Crop, and Livestock Producers Who Raised Crops in 1995

Raise Crops?	Non-member		Crop-member		Livestock-member		Statistics
	N	%	N	%	N	%	
Yes	170	97.7	229	99.6	74	87.1	$\chi^2 = 31.47$ $p = .000$ $df = 2$ $= .25$
No	4	2.3	1	0.4	11	12.9	
N	174	100	230	100	85	100	

The number, percent, and mean number of acres of selected crops produced by farmers in their respective groups was also tabulated. A means test (one-way ANOVA) was used to determine the significance of acreage differences among the three groups. Although group mean acres of eight of the 18 crops were significant, the number of farmers producing some of the crops were low.

Producers in the Crop group were more likely to plant a higher acreage of edible beans than producers in the Non-member group. Mean acres of edible beans for the Non-member, Crop, and Livestock groups were 187.6 acres, 309.8 acres, and 179.3 acres, respectively. Producers in the Crop group planted more acres of barley in 1995 than did the Non-member and Livestock groups ( $F=9.05$ ;  $p=.000$ ). Mean acres of barley for the three groups were Non-member, 215.0 acres; Crop, 303.1 acres; and Livestock, 177.3 acres. Significant differences in mean acres of corn exist among each of the three groups ( $F=13.08$ ;  $p=.000$ ). Mean acres of corn for the Non-member, Crop, and Livestock groups were 288.8 acres, 444.4 acres, and 124.5 acres, respectively. Producers in the Crop group planted more acres of flax in 1995 than did the Non-member and Livestock groups

( $F=6.45$ ;  $p=.006$ ). Mean acres of flax for the three groups were Non-member, 92.9 acres; Crop, 333.4 acres; and Livestock, 114.0 acres.

Producers in the Livestock group planted more acres of hay (not alfalfa) in 1995 than did the Non-member and Crop groups ( $F=6.01$ ;  $p=.003$ ). The Non-member, Crop, and Livestock groups produced 148.7, 105.9, and 357.9 acres of hay, respectively. Producers in the Crop group planted significantly more acres of soybeans in 1995 than did producers in the Non-member group ( $F=4.56$ ;  $p=.011$ ). The Non-member, Crop, and Livestock groups produced 296.2, 512.9, and 150.0 acres of soybeans, respectively.

Durum wheat acres for the three groups were Non-member, 505.3 acres; Crop, 922.4 acres; and Livestock, 752.4 acres. There was a significant difference in acres of durum wheat between the Non-member and Crop groups ( $F=3.99$ ;  $p=.020$ ). Spring wheat acres for the three groups were Non-member, 492.4 acres; Crop, 661.2 acres; and Livestock, 456.0 acres. Producers in the Crop group planted significantly more spring wheat acres in 1995 than did the Non-member and Livestock groups ( $F=5.51$ ;  $p=.004$ ) (Table 4.6).

Table 4.6. Number of Producers in the Non-member, Crop, and Livestock Groups Who Raised Selected Crops in 1995 and the Mean Number of Acres Raised Per Group

Selected Crops	Non-member			Crop-member			Livestock-member			F	p
	N	%	Mean	N	%	Mean	N	%	Mean		
Alfalfa	54	31.8	134.2	35	15.3	84.7	29	39.2	351.8	2.92	.057
Edible beans	27	15.9	187.6	65	28.4	309.8	3	4.1	179.3	3.31	.041 <sup>a</sup> ,
Buckwheat	2	1.2	115.0	5	2.2	214.0	2	2.7	175.0	0.24	.791
Barley	80	47.1	215.0	46	62.2	303.1	114	49.8	177.3	9.05	.000 <sup>a,c</sup>
Corn	94	55.3	288.3	111	48.5	444.4	21	28.4	124.5	13.08	.000 <sup>a,b,c</sup>
Flax	12	7.1	92.9	8	3.5	333.4	5	6.8	114.0	6.45	.006 <sup>a,c</sup>
Hay	41	24.1	148.7	17	7.4	105.9	18	24.3	357.9	6.01	.003 <sup>b,c</sup>
Millet	25	14.7	147.9	10	4.4	111.6	5	6.8	57.6	2.12	.133
Oats	52	30.6	119.4	21	9.2	120.7	25	33.8	92.8	.65	.522
Rye	2	1.2	87.5	1	.4	260.0	1	1.4	30	1.41	.510
Soybeans	42	24.7	296.2	126	55.0	512.9	1	1.4	150.0	4.56	.011 <sup>a</sup>
Sugar beets	4	2.4	136.3	44	19.2	335.2	2	2.7	175.0	2.85	.067
Sunflowers	66	38.8	340.4	97	42.4	399.7	16	21.6	370.5	.50	.610
Wht., Durum	50	29.4	505.3	65	28.4	922.4	17	23.0	752.4	3.99	.020 <sup>a</sup>
Wht., Spring	114	67.1	492.4	175	76.4	661.2	46	62.2	456.0	5.51	.004 <sup>a,c</sup>
Wht., Winter	5	2.9	91.0	7	3.1	358.6	-	-	-	6.30	.030
Canola	-	-	-	14	6.1	175.0	3	4.1	75.0	.66	.427
Other	13	7.6	239.4	8	3.5	227.8	3	4.1	58.3	1.14	.341
N	170			229			74				

<sup>a</sup> = difference between Non-member and Crop member.

<sup>b</sup> = difference between Non-member and Livestock member.

<sup>c</sup> = difference between Crop member and Livestock member.

A cross tabulation was used to determine the significance of farmers who intended to increase the acreage of one of their current crops within the next five years. Table 4.7 shows the number and percent of the respective groups who answered “yes,” “no,” and “unsure.” There was no significant difference of responses among the three groups ( $\chi^2=3.86$ ;  $p=.424$ ;  $\alpha=.09$ ).

Table 4.7. Number of Producers in the Non-member, Crop, and Livestock Groups Who Intend to Increase Acreage of an Existing Crop Within the Next Five Years

Increase Crops?	Non-member		Crop		Livestock-mbr		Statistics
	N	%	N	%	N	%	
Yes	78	45.9	107	46.7	29	39.2	$\chi^2 = 3.86$ $p = .424$ $df = 4$ $\alpha = .09$
No	74	43.5	90	39.3	31	41.9	
Unsure	18	10.6	32	14	14	18.9	
N	170	100	229	100	74	100	

Table 4.8 delineates the specific crops that producers in the three groups intend to increase within the next five years. Due to the low count and empty cells, a statistical test was not used to analyze this data.

Although the decision to increase a crop was not significant, there was a significant difference when producers were asked if the increase was due to a contract cooperative investment ( $\chi^2=17.73$ ;  $p=.000$ ;  $\alpha=.29$ ). Of the 107 producers in the Crop group who intended to increase crop acreage, 36.4 percent indicated that the increase was due to a cooperative investment. Of the 29 producers in the Livestock group, 17.2 percent indicated that their planned crop increase was due to a cooperative investment. Of the 78

producers in the Non-member group, 10.3 percent indicated that their planned crop increase was due to a cooperative investment (Table 4.9).

Table 4.8. Number of Producers in the Non-member, Crop, and Livestock Groups Who Intend to Increase Acreage of Specific Crops Within the Next Five Years

What Crops?	Non-member		Crop-member		Livestock-member	
	N	%	N	%	N	%
All Crops	3	3.8	8	7.5	-	-
Whatever pos.	-	-	1	1.9	-	-
Alfalfa	2	2.6	-	-	5	17.2
Edible beans	1	1.3	3	2.8	-	-
Barley	10	12.8	6	5.6	4	13.8
Corn	18	23.1	39	36.4	2	6.9
Hay	-	-	-	-	2	6.9
Oats	3	3.8	-	-	2	6.9
Soybeans	4	5.1	12	11.2	1	3.4
Sugar beets	-	-	5	4.7	-	-
Sunflowers	3	3.8	3	2.8	1	3.4
Wheat, Durum	6	7.7	5	4.7	2	6.9
Wheat, Spring	26	33.3	17	15.9	9	31.0
Canola	2	2.6	4	3.7	1	3.4
Potatoes	-	-	2	1.9	-	-
Field peas	-	-	1	.9	-	-
Carrots	-	-	1	.9	-	-
N	78	100	107	100	29	100

Table 4.9. Number of Producers in the Non-member, Crop, and Livestock Groups Whose Planned Crop Increase Is Due to Investment in a Contract Cooperative

For Co-op?	Non-member		Crop-member		Livestock-member		Statistics
	N	%	N	%	N	%	
Yes	8	10.3	39	36.4	5	17.2	$\chi^2 = 17.73$ $p = .000$ $df = 2$ $= .29$
No	70	89.7	68	63.6	24	82.8	
N	78	100	107	100	29	100	

Table 4.10 shows the number and percent of producers in their respective groups who intend to add a new crop within the next five years. The cross-tabulation statistic ( $\chi^2=19.03$ ;  $p=.000$ ;  $=.20$ ) determined a significant difference among the Non-member, Crop, and Livestock groups. Of the 174 Non-member producers, 28.2 percent planned to add a crop within the next five years. Of the 230 producers in the Crop group, 41.7 percent planned to add a new crop, and 30.6 percent of the producers in the Livestock group planned to add a new crop within the next five years (Table 4.10).

Table 4.10. Number of Producers in the Non-member, Crop, and Livestock Groups Who Intend to Add a New Crop Within the Next Five Years

Increase Crops?	Non-member		Crop-member		Livestock-member		Statistics
	N	%	N	%	N	%	
Yes	49	28.2	96	41.7	26	30.6	$\chi^2 = 19.03$ $p = .000$ $df = 4$ $\lambda = .20$
No	102	58.6	88	38.3	48	56.5	
Unsure	23	13.2	46	20	11	12.9	
N	174	100	230	100	85	100	

Table 4.11 delineates the specific crops that the producers plan to add to their operation. Due to the empty and low cell counts, no statistical tests were used to analyze the data.

Of the 96 producers in the Crop group who intended to add a new crop, 38.5 percent indicated that the addition was due to a contract cooperative investment. Of the 26 producers in the Livestock group who planned to add a crop, 26.9 percent indicated that the addition was due to a contract cooperative investment. Of the 49 producers in the Non-member group who intended to add a crop within the next five years, 14.3 percent indicated that the addition was due to a contract cooperative investment. The decision to add a crop for a contract cooperative investment was significant ( $\chi^2=9.24$ ;  $p=.010$ ;  $\lambda=.23$ ) (Table 4.12).

Table 4.11. Number of Producers in the Non-member, Crop, and Livestock Groups Who Intend to Add Specific Crops Within the Next Five Years

What Crops?	Non-member		Crop-member		Livestock-mbr	
	N	%	N	%	N	%
Do not know	4	8.2	10	10.4	1	3.8
Edible beans	7	14.3	8	8.3	2	7.7
Barley	1	2.0	5	5.2	1	3.8
Corn	3	6.1	24	25.0	4	15.4
Hay	-	-	-	-	2	7.7
Oats	1	2.0	-	-	1	3.8
Soybeans	3	6.1	7	7.3	1	3.8
Sugar beets	1	2.0	5	5.2	-	-
Sunflowers	9	18.4	7	7.3	4	15.4
Wheat, spring	4	8.2	2	2.1	2	7.7
Canola	7	14.3	9	9.4	2	7.7
Oil seed Crop	1	2.0	1	1.0	2	7.7
Flax	3	6.1	3	3.1	1	3.8
Crambe	-	-	1	1.0	-	-
Sweet clover	1	2.0	1	1.0	-	-
Mustard	1	2.0	-	-	-	-
Safflower	1	2.0	-	-	-	-
Peas	1	2.0	4	4.2	1	3.8
Vegetables	-	-	1	1.0	-	-
Carrots	1	2.0	5	5.2	1	3.8
Cabbage	-	-	1	1.0	-	-
Garlic	-	-	1	1.0	1	3.8
Raspberries	-	-	1	1.0	-	-
N	49	100	96	100	26	100

Table 4.12. Number of Producers in the Non-member, Crop, and Livestock Groups Whose Intended Crop Addition Is Due to Investment in a Contract Cooperative.

Add for co-op?	Non-member		Crop-member		Livestock-mbr		Statistics
	N	%	N	%	N	%	
Yes	7	14.3	37	38.5	7	26.9	$\chi^2 = 9.24$ $p = .010$ $df = 2$ $= .23$
No	42	85.9	59	61.5	19	73.1	
N	49	100	96	100	26	100	

### Livestock Production Practices

There was a significant difference in the number of producers in the three groups who raised livestock in 1995 ( $\chi^2=120.71$ ;  $p=.000$ ;  $\lambda=.50$ ). Of the 85 producers in the Livestock group, 96.5 percent raised livestock, compared with 63.2 percent of the Non-member group and 30.0 percent of the Crop group (Table 4.13).

Table 4.13. Number of Producers in the Non-member, Crop, and Livestock Groups Who Raised Livestock in 1995

Raised Livestock?	Non-member		Crop-member		Livestock-mbr		Statistics
	N	%	N	%	N	%	
Yes	110	63.2	69	30	82	96.5	$\chi^2 = 120.71$ $p = .000$ $df = 2$ $= .50$
No	64	36.8	161	70	3	3.5	
N	174	100	230	100	85	100	

Table 4.14 shows the number, percent, and mean number of selected livestock of the three groups. Due to low counts and empty cells, no statistical analysis was completed on the percent of each group raising livestock. Analysis of variance was completed on the mean number of livestock raised by the respective groups. There were no significant differences among the three groups regarding the mean number of seven types of livestock (Table 4.14).

Table 4.14. Number of Producers in the Non-member, Crop, and Livestock Groups Who Raised Selected Livestock in 1995 and the Mean Number of Head Raised Per Group

Selected Livestock	Non-member			Crop-member			Livestock-member			F	p
	N	%	Mean	N	%	Mean	N	%	Mean		
Beef cattle	79	71.8	114.5	59	85.5	103.2	31	37.8	121.4	.22	.799
Dairy cattle	45	40.9	84.1	-	-	-	35	42.7	90.6	.34	.562
Bison	-	-	-	2	2.9	28.5	39	47.6	130.8	.86	.359
Hogs	15	13.6	568.7	9	13.0	760.0	2	2.4	44.0	.64	.535
Sheep	3	2.7	183.0	4	5.8	105.0	2	2.4	412.5	.82	.484
Poultry	2	1.8	175.0	2	2.9	415.0	3	3.7	60.0	.92	.469
Other	2	1.8	247.5	1	1.4	-	2	2.4	103.0	.20	.833
N	110	100		69	100		82	100			

Table 4.15 shows the number and percent of producers who intend to increase the number of livestock on their farm within the next five years. Of the 82 producers in the Livestock group, 65.9 percent intend to increase their number of livestock within the next five years, compared with 37.3 percent of the Non-member group and 34.8 percent of the Livestock group. There was a significant difference among the Non-member, Crop, and Livestock groups ( $\chi^2=25.95$ ;  $p=.000$ ;  $\eta^2=.32$ ) (Table 4.15).

Table 4.15. Number of Producers in the Non-member, Crop, and Livestock Groups Who Intend to Increase the Number of Head of Livestock Within the Next Five Years

Increase Head?	Non-member		Crop-member		Livestock-member		Statistics
	N	%	N	%	N	%	
Yes	41	37.3	24	34.8	54	65.9	$\chi^2 = 25.95$ $p = .000$ $df = 4$ $= .32$
No	61	55.5	36	52.2	18	22.0	
Unsure	8	7.3	9	13.0	10	12.2	
N	110	100	69	100	82	100	

Table 4.16 shows what livestock farmers in their respective groups intend to increase on their farms within the next five years. Due to the low count and empty cells, statistical analysis was not appropriate.

Table 4.16. Number of Producers in the Non-member, Crop, and Livestock Groups Who Intend to Increase the Number of Head of Specific Types of Livestock Within the Next Five Years

What Livestock?	Non-member		Crop-member		Livestock-member	
	N	%	N	%	N	%
Do not know	-	-	3	12.5	-	-
Beef cattle	27	65.9	17	70.8	9	16.7
Dairy cattle	10	24.4	-	-	11	20.4
Bison	-	-	1	4.2	32	59.3
Hogs	3	7.3	1	4.2	-	-
Sheep	1	2.4	2	8.3	1	1.9
Goats	-	-	-	-	1	1.9
N	41	100	24	100	54	100

Of the 41 producers in the Non-member group who intend to increase their number of livestock, 19.5 percent indicated that the increase was due to a contract cooperative investment. Of the 24 producers in the Crop group, 41.7 percent indicated that their planned increase was due to a contract cooperative investment. Of the 54 producers in the Livestock group, 59.3 percent indicated that their planned increase was due to a contract cooperative investment. This difference was significant ( $\chi^2=15.11$ ;  $p=.000$ ;  $\phi=.36$ ) (Table 4.17).

Table 4.17. Number of Producers in the Non-member, Crop, and Livestock Groups Whose Intended Increase in Livestock Is Due to Investment in a Contract Cooperative

Increase for Co-op?	Non-member		Crop-member		Livestock-member		Statistics
	N	%	N	%	N	%	
Yes	8	19.5	10	41.7	32	59.3	$\chi^2 = 15.11$ $p = .000$ $df = 2$ $= .36$
No	33	80.5	14	58.3	22	40.7	
N	41	100	24	100	54	100	

The final measurement of livestock production changes regarding contract cooperative investment pertained to the addition of livestock to the farming operation. Of the 174 producers in the Non-member group, 9.8 percent indicated that they would add livestock to their farm within the next five years. Of the 230 producers in the Crop group, 4.8 percent planned to add livestock, compared with 16.5 percent of the 85 members in the Livestock group. This difference was significant ( $\chi^2=14.71$ ;  $p=.000$ ;  $\lambda=.17$ ) (Table 4.18).

Table 4.18. Number of Non-member, Crop, and Livestock Producers Who Intend to Add a New Livestock Enterprise Within the Next Five Years

Add New Livestock?	Non-member		Crop-member		Livestock-member		Statistics
	N	%	N	%	N	%	
Yes	17	9.8	11	4.8	14	16.5	$\chi^2 = 14.71$ $p = .000$ $df = 4$ $= .17$
No	144	82.8	201	87.4	60	70.6	
Unsure	13	7.5	18	7.8	11	12.9	
N	174	100	230	100	85	100	

Table 4.19 shows what type of livestock producers in their respective groups plan to add within the next five years. Due to the low count and empty cells, statistical analysis was not appropriate.

Table 4.19. Specific Types of Livestock Enterprises and the Number of Non-member, Crop, and Livestock Producers Who Intend to Add Them to Their Operation Within the Next Five Years

What Livestock?	Non-member		Crop-member		Livestock-member	
	N	%	N	%	N	%
Beef cattle	12	70.6	7	63.6	5	35.7
Bison	1	5.9	2	18.2	3	21.4
Hogs	3	17.6	-	-	2	14.3
Sheep	-	-	2	18.2	1	7.1
Elk	1	5.9	-	-	1	7.1
Reindeer	-	-	-	-	1	7.1
Ostrich	-	-	-	-	1	7.1
N	17	100	11	100	14	100

Of the 17 producers in the Non-member group who intend to add a livestock enterprise within the next five years, 17.6 percent indicated that the addition was due to a contract cooperative investment. Of the 11 producers in the Crop group, 9.1 percent indicated that their planned addition was due to a contract cooperative investment. Of the 14 producers in the Livestock group, 28.6 percent indicated that their planned addition was due to a contract cooperative investment. There was no significant difference among the three groups ( $\chi^2=1.55$ ;  $p=.460$ ;  $\alpha=.19$ ) (Table 4.20).

Table 4.20. Number of Non-member, Crop, and Livestock Producers Whose Intended Addition of a Livestock Enterprise to Their Operation Is Due to Investment in a Contract Cooperative

Add for co-op?	Non-member		Crop-member		Livestock-member		Statistics
	N	%	N	%	N	%	
Yes	3	17.6	1	9.1	4	28.6	$\chi^2 = 1.55$ $p = .460$ $df = 2$ $\lambda = .19$
No	14	82.4	10	90.9	10	71.4	
N	17	100	11	100	14	100	

Analysis of these attributes revealed significant and substantive differences in personal and farm organizational attributes between the members and non-members. Therefore, the null hypothesis, that there are no differences in attributes between the two groups, is rejected.

H<sub>2</sub>: Members have different attitudes and perceptions about contract cooperatives than non-members.

### Family Member to Take Over Farm

Producers were asked if one of their sons, daughters, or other family member(s) would take over the farm after they retire. The Chi-square test of the nominal-level independent variable (yes, no, unsure) was significant with a low level of association ( $\chi^2=15.24$ ;  $p=.004$ ;  $\lambda=.18$ ). Of the 174 producers in the Non-member group, 47.7 percent reported “yes,” 25.3 percent reported “no,” and 27.0 percent were unsure if a son, daughter, or other family member would take over their farm. Of the 230 producers in the Crop group, 45.2 percent reported “yes,” 13.9 percent reported “no,” and 40.9 percent

were “unsure.” Of the 85 producers in the Livestock group, 54.1 percent reported “yes,” 20.0 percent reported “no” and 25.9 percent were unsure if a son, daughter, or other family member would take over their farm (Table 4.21).

Table 4.21. Non-member, Crop, and Livestock Groups’ Belief That a Son, Daughter, or Other Family Member Will Take Over the Family Farm After They Retire

	Non-mbr		Crop-mbr		Lvstk-mbr		Statistics
	N	%	N	%	N	%	
Yes	83	47.7	104	45.2	46	54.1	$\chi^2 = 15.24$ $p = .004$ $df = 4$ $\lambda = .18$
No	44	25.3	32	13.9	17	20.0	
Unsure	47	27.0	94	40.9	22	25.9	
N	174	100	230	100	85	100	

### **Perceived Role in Agriculture**

Producers were asked to indicate their perception of their role in the agriculture industry. Six segments of the industry were substituted in the question, “I’m in the food \_\_\_\_\_ business,” to which producers replied using a five-point Likert scale. All three groups strongly perceived themselves as in the food production business ( $F=2.22$ ;  $p=.110$ ). Non-member, Crop, and Livestock group responses were 1.42, 1.30, and 1.35, respectively. There were significant differences among all three groups when asked about their respective roles in the food processing business ( $F=46.70$ ;  $p=.000$ ). Non-member responses averaged 3.66; Crop producers, 2.42; and Livestock producers, 2.78. Average responses regarding the transportation business for Non-members, Crop, and Livestock members were 3.29, 2.90, and 3.31, respectively. Crop-investors more strongly perceived themselves to be in the food transportation business than did Non-members and Livestock investors ( $F=6.08$ ;  $p=.002$ ). When asked about their role in food marketing, average responses for the three groups were Non-member, 2.80; Crop, 2.42; and Livestock, 2.64. Analysis identified a significant difference between the Non-member and Crop-investor groups ( $F=4.78$ ;  $p=.008$ ) (Table 4.22).

Table 4.22. Responses of Non-member, Crop, and Livestock Groups Regarding Their Perceived Role in the Agricultural Industry\*

Selected roles	Non-mbr	Crop-mbr	Lvstk-mbr	F	p
Food production business	1.42	1.30	1.35	2.22	.110
Food processing business	3.66	2.42	2.78	46.70	.000 <sup>a,b,c</sup>
Food transportation business	3.29	2.90	3.31	6.08	.002 <sup>a,c</sup>
Food marketing business	2.80	2.42	2.64	4.78	.008 <sup>a</sup>
Food wholesale business	3.35	2.85	3.21	8.43	.000 <sup>a,c</sup>
Food retail business	3.82	3.40	3.34	8.14	.000 <sup>a,b</sup>
N	174	230	85		

\*Means based on 5-point Likert scale with 1=strongly agree and 5=strongly disagree.

<sup>a</sup> = difference between Non-member and Crop member.

<sup>b</sup> = difference between Non-member and Livestock member.

<sup>c</sup> = difference between Crop member and Livestock member.

Regarding their roles in the food wholesale business, average responses for the three groups were Non-member, 3.35; Crop, 2.85; and Livestock, 3.21. The average response for the Crop group was significantly different from the Non-member and Livestock groups (F=8.43; p=.000). Average group responses for their role in the food retail business were Non-member, 3.82; Crop, 3.40; and Livestock, 3.34. The Non-member responses were significantly different from those of the Crop and Livestock groups (F=8.14; p=.000) (Table 4.22).

### **Time Spent on Agricultural Roles in the Future**

Using a three-point Likert scale with 1=increase and 3=decrease, respondents were asked to indicate if the amount of time spent on the same six agricultural roles would increase, remain the same, or decrease in the future. Average group responses regarding time spent on commodity production were Non-member, 1.81; Crop, 1.52; and Livestock, 1.44. The Non-member group was less likely to increase time spent on commodity

production in the future than the Crop and Livestock groups ( $F=13.74$ ;  $p=.000$ ). This group was also less likely to increase time spent on commodity processing in the future than the Crop and Livestock groups ( $F=16.35$ ;  $p=.000$ ). Average responses for the Non-member, Crop, and Livestock groups were 1.90, 1.51, and 1.68, respectively. Non-members were also less likely to increase time spent on commodity transportation in the future than were the Crop and Livestock groups ( $F=8.10$ ;  $p=.000$ ). Average responses for the Non-member, Crop, and Livestock groups were 1.96, 1.69, and 1.78, respectively.

Non-members were less likely to increase time spent on commodity marketing in the future than were the Crop and Livestock groups ( $F=12.15$ ;  $p=.000$ ). Average responses for the Non-member, Crop, and Livestock groups were 1.76, 1.44, and 1.51, respectively. Non-members were also less likely to increase time spent on commodity wholesaling efforts than were the Crop and Livestock groups ( $F=10.95$ ;  $p=.000$ ). Average responses regarding wholesaling for the Non-member, Crop and Livestock groups were 1.94, 1.64, and 1.73, respectively. Non-members were less likely to increase time spent on food commodity retailing efforts than were the Crop and Livestock groups ( $F=7.58$ ;  $p=.000$ ). Average responses for the Non-member, Crop and Livestock groups were 1.94, 1.69, and 1.76, respectively (Table 4.23).

Table 4.23. Responses of Non-member, Crop, and Livestock Groups Regarding the Amount of Time They Expect to Spend on Selected Agricultural Roles in the Future\*

Selected roles	Non-mbr	Crop-mbr	Lvstk-mbr	F	p
Food commodity production	1.81	1.52	1.44	13.74	.000 <sup>a,b</sup>
Food commodity processing	1.90	1.51	1.68	16.35	.000 <sup>a,b</sup>
Food commodity transp.	1.96	1.69	1.78	8.10	.000 <sup>a,b</sup>
Food commodity marketing	1.76	1.44	1.51	12.15	.000 <sup>a,b</sup>
Food commodity wholesale	1.94	1.64	1.73	10.95	.000 <sup>a,b</sup>
Food commodity retail	1.94	1.69	1.76	7.58	.000 <sup>a,b</sup>
N	170	229	79		

\*Means based on 3-point Likert scale with 1=increase, 2=remain the same and 3=decrease.

<sup>a</sup> = difference between Non-member and Crop member.

<sup>b</sup> = difference between Non-member and Livestock member.

### Perceptions Regarding How Often Cooperatives Would Meet Objectives

Producers were asked how often the contract cooperatives would accomplish nine selected objectives. A five-point Likert scale was used to categorize their responses, where 1=very often and 5=almost never. Producers in the Livestock group (1.78) most strongly agreed with the statement that the cooperatives would increase farm income. Producers in the Crop group (2.04) were more likely to believe in the increased farm income than the Non-members (2.43). Differences were significant among each of the three groups ( $F=20.65$ ;  $p=.000$ ). Average responses to the statement “Cooperative investment reduces marketing risks” for the Non-member, Crop, and Livestock groups were 2.77, 2.33, and 2.22, respectively. Non-members were less likely to believe that investment will reduce marketing risk than were the Crop and Livestock groups ( $F=11.91$ ;  $p=.000$ ). When asked how often investment would gain access to value-added markets, the Non-member, Crop, and Livestock group averages were 2.22, 1.82, and 1.82,

respectively. There was a significant difference among the Non-member, Crop, and Livestock groups ( $F=12.40$ ;  $p=.000$ ). When asked how often investment would enable networking with people with similar interests, average responses for the Non-member, Crop, and Livestock groups were 2.13, 1.89, and 1.72, respectively. Producers in the Crop and Livestock groups felt that the contract cooperatives offered more networking potential than did producers in the Non-member group ( $F=8.18$ ;  $p=.000$ ).

When asked how often the contract cooperatives would increase an investor's knowledge/information base, average group responses were Non-member, 2.19; Crop, 1.87; and Livestock, 1.76. Producers in the Crop and Livestock groups felt that investment would increase their knowledge/information base more often than did producers in the Non-member group ( $F=10.98$ ;  $p=.000$ ).

Evaluating how often the contract cooperatives would provide new services, the average group responses were Non-member, 2.47; Crop, 2.30; and Livestock, 2.03. There were significant differences between the Non-member and Livestock groups as well as between the Crop and Livestock groups ( $F=6.29$ ;  $p=.002$ ). Livestock producers more strongly identified with the cooperatives providing new services than did Non-member and Crop producers.

There were significant differences among each of the groups regarding how often cooperative investment would increase farm productivity ( $F=9.83$ ;  $p=.000$ ). Average responses for the Non-member, Crop, and Livestock groups were 2.74, 2.44, and 2.19, respectively. Livestock producers felt that investment would increase farm productivity more often than did the other two groups (Table 4.24).

Table 4.24. Responses of Non-member, Crop, and Livestock Groups Regarding Their Attitudes Toward How Often Contract Cooperatives Would Meet Selected Objectives\*

Selected variables	Non-mbr	Crop-mbr	Lvstk-mbr	F	p
Increase farm income	2.43	2.04	1.78	20.65	.000 <sup>a,b,c</sup>
Reduce marketing risk	2.77	2.33	2.22	11.91	.000 <sup>a,b</sup>
Gain market access	2.22	1.82	1.82	12.40	.000 <sup>a,b</sup>
Network	2.13	1.89	1.72	8.18	.000 <sup>a,b</sup>
Increase knowledge	2.19	1.87	1.76	10.98	.000 <sup>a,b</sup>
Provide new services	2.47	2.30	2.03	6.29	.002 <sup>b,c</sup>
Increase farm productivity	2.74	2.44	2.19	9.83	.000 <sup>a,b,c</sup>
Consistent market outlet	2.23	2.01	1.93	4.98	.007 <sup>a,b</sup>
Sell shares at higher price	2.89	2.61	2.56	4.14	.016 <sup>a,b</sup>
N	172	230	85		

\*Means based on 5-pt Likert scale with 1=very often and 5=almost never.

<sup>a</sup> = difference between Non-member and Crop member.

<sup>b</sup> = difference between Non-member and Livestock member.

<sup>c</sup> = difference between Crop member and Livestock member.

When asked how often the contract cooperatives would provide a consistent outlet to market products, the Non-member, Crop, and Livestock group averages were 2.23, 2.01, and 1.93, respectively. Crop and Livestock producers more strongly believed that this objective would be met than did the Non-members ( $F=4.98$ ;  $p=.007$ ). The final statement pertaining to business outcomes addressed the transferrable delivery rights of contract cooperative stock. Producers were asked how often one could purchase shares at a low price now and sell them for a higher price later. Average responses for the three groups were Non-member, 2.89; Crop, 2.61; and Livestock, 2.56. The Crop and Livestock producers believed that shares could be sold for a higher price more often than did the Non-members ( $F=4.14$ ;  $p=.016$ ) (Table 4.24).

### **Producers' Attitudes Toward Contract Cooperatives**

Farmers have varying attitudes about contract cooperatives. Producers were asked to respond to 10 statements about these cooperatives. A five-point Likert scale was used to categorize responses, where 1=strongly agree and 5=strongly disagree.

Responding to the statement that required investments are too high, the Non-member, Crop, and Livestock group averages were 2.43, 3.28, and 3.09, respectively. The Non-member group more strongly agreed with this statement than did the Crop and Livestock groups ( $F=37.45$ ;  $p=.000$ ). Non-members more strongly agreed with the statement that the contract cooperatives benefit only the wealthy producers ( $F=19.88$ ;  $p=.000$ ). Average responses for the three groups were Non-member, 3.05; Crop, 3.62; and Livestock, 3.78. Non-members also more strongly agreed with the statement that these cooperatives' delivery contracts were too strict than did the Crop and Livestock groups ( $F=11.64$ ;  $p=.000$ ). Average responses for the three groups were Non-member, 3.16; Crop, 3.52; and Livestock, 3.68. There was a significant difference between the Non-member and Crop groups regarding the statement that farmers should not own food companies ( $F=3.43$ ;  $p=.033$ ). Average responses for the three groups were Non-member, 4.21; Crop, 4.40; and Livestock, 4.39. Average group responses to the statement that these cooperatives are get-rich-quick schemes were Non-member, 4.00; Crop, 4.30; and Livestock, 4.32. The Non-member group more strongly agreed with this statement than did the Crop and Livestock groups ( $F=10.83$ ;  $p=.000$ ).

The Non-member group more strongly agreed with the statement that farmers use these cooperatives as last-ditch efforts to survive financially than did the Crop and Livestock groups ( $F=8.38$ ;  $p=.000$ ). Average responses for the Non-member, Crop, and Livestock groups were 3.62, 4.04, and 3.96, respectively. Regarding the contract cooperatives' ability to compete with investor-oriented firms, average group responses were Non-member, 3.62; Crop, 4.03; and Livestock, 4.00. The Crop and Livestock

groups had more confidence in the contract cooperatives' ability to compete than did the Non-members ( $F=10.41$ ;  $p=.000$ ). Non-members more strongly agreed with the statement that these cooperatives' managers have too much control than did the Crop and Livestock groups ( $F=6.42$ ;  $p=.002$ ) Average responses for this statement were Non-member, 3.45; Crop, 3.72; and Livestock, 3.82. Producers were asked to respond to the statement that these cooperatives offer inferior quality products. Average responses for the Non-member, Crop, and Livestock groups were 4.02, 4.27, and 4.36, respectively. There was a significant difference between the Non-member group and the Crop and Livestock groups ( $F=5.39$ ;  $p=.005$ ) (Table 4.25).

Table 4.25. Responses of Non-member, Crop, and Livestock Groups Regarding Their Ideologies Toward Contract Cooperatives\*

Selected Variables	Non-mbr	Crop-mbr	Lvstk-mbr	F	p
Required investment too high	2.43	3.28	3.09	37.45	.000 a,b
Benefit only the wealthy	3.05	3.62	3.78	19.88	.000 a,b
Contracts are too strict	3.16	3.52	3.68	11.64	.000 a,b
Shouldn't own food companies	4.21	4.40	4.39	3.43	.033 a
Get-rich-quick schemes	4.00	4.30	4.32	10.83	.000 a,b
Last-ditch efforts to survive	3.62	4.04	3.96	8.38	.000 a,b
Can not compete with IOFs	3.62	4.03	4.00	10.41	.000 a,b
Mgr's have too much control	3.45	3.72	3.82	6.42	.002 a,b
Inferior quality products	4.02	4.27	4.36	5.39	.005 a,b
N	173	230	85		

\*Means based on 5-point Likert scale with 1=strongly agree and 5=strongly disagree.

a = difference between Non-member and Crop member.

b = difference between Non-member and Livestock member.

### Importance Producers Place on Investment Considerations

Producers were asked to rate the level of importance they placed on 11 items when considering investment in any contract cooperative. A five-point Likert scale was used to categorize the responses, where 1=very unimportant and 5=very important.

The group values for the importance of the intended location of the production plant were Non-member, 4.00; Crop, 3.73; and Livestock, 4.21. The Livestock group placed the most importance on plant location followed by the Non-member group and the Crop group. There were significant differences between the Non-member and Crop groups as well as between the Crop and Livestock groups ( $F=5.46$ ;  $p=.005$ ). Of the three groups, the Crop group placed the highest importance on the professional feasibility study results when evaluating a contract cooperative investment. Average responses for the Non-

member, Crop, and Livestock groups were 4.11, 4.58, and 4.39, respectively. There was a significant difference between the Non-member and Crop groups ( $F=7.52$ ;  $p=.000$ ).

The Crop group also placed a higher level of importance on the marketing plan when considering a contract cooperative investment than did the Non-member and Livestock groups ( $F=4.39$ ;  $p=.013$ ). Average values for the Non-member, Crop, and Livestock groups were 4.39, 4.67, and 4.57, respectively. The level of importance placed on media coverage was the lowest of the 11 selected considerations. No significant differences exist among the three groups on this variable ( $F=2.25$ ;  $p=.108$ ). With three equaling a neutral level of importance, values for the Non-member, Crop and Livestock groups were 3.18, 2.97, and 3.36, respectively. Levels of importance placed on the offering circular or prospectus by the Non-member, Crop, and Livestock groups were 3.72, 3.88, and 3.61, respectively. There were no significant differences among the three groups ( $F=1.63$ ;  $p=.197$ ).

There were no significant differences among the three groups' concerns about the level of risk when considering cooperative investment ( $F=.22$ ;  $p=.804$ ). Average responses for the three groups were Non-member, 4.39; Crop, 4.34; and Livestock, 4.31. The Crop group placed a higher level of importance on the cooperative investment's potential to make a profit than did the Non-member and Livestock groups ( $F=5.88$ ;  $p=.003$ ). Average responses for the three groups were Non-member, 4.48; Crop, 4.76; and Livestock, 4.68. There was no significant difference on the level of importance placed on the membership conditions or qualifications among the three groups ( $F=.14$ ;  $p=.868$ ). Average responses for the Non-member, Crop, and Livestock groups were 4.00, 3.99, and 4.07, respectively (Table 4.26).

Table 4.26. Responses of Non-member, Crop, and Livestock Groups on the Importance of Selected Variables When Considering Investment in a Contract Cooperative\*

Selected variables	Non-mbr	Crop-mbr	Lvstk-mbr	F	p
Intended plant location	4.00	3.73	4.21	5.46	.005 <sup>a,c</sup>
Feasibility study results	4.11	4.58	4.39	7.52	.000 <sup>a</sup>
Marketing plan	4.39	4.67	4.57	4.39	.013 <sup>a</sup>
Media coverage	3.18	2.97	3.36	2.25	.108
Prospectus	3.72	3.88	3.61	1.63	.197
Risk concerns	4.39	4.34	4.31	.22	.804
Profit potential	4.48	4.76	4.68	5.88	.003 <sup>a</sup>
Membership conditions	4.00	3.99	4.07	.14	.868
Initial investment cost	4.31	4.42	4.21	1.43	.241
Committee members	4.06	4.20	4.29	1.26	.286
Stable market outlet	4.58	4.67	4.74	1.14	.320
N	84	127	42		

\*Means based on a 5-point Likert scale with 1=very unimportant and 5=very important.

<sup>a</sup> = difference between Non-member and Crop member.

<sup>c</sup> = difference between Crop member and Livestock member.

There was no significant difference among the three groups regarding the level of importance placed on the initial investment cost ( $F=1.43$ ;  $p=.241$ ). Average responses for the three groups were Non-member, 4.31; Crop, 4.42; and Livestock, 4.21. Although the level of importance placed on the members of the steering board or planning committee was high across all three groups, there was no significant difference among the groups ( $F=1.26$ ;  $p=.286$ ). Average responses for the Non-member, Crop, and Livestock groups were 4.06, 4.20, and 4.29, respectively. The level of importance placed on having a stable market outlet was also high across the three groups. There was no significant difference

among the groups ( $F=1.14$ ;  $p=.320$ ). Average responses for the three groups were Non-member, 4.58; Crop, 4.67; and Livestock, 4.74 (Table 4.26).

### **Long-term Return and Risk of Investment**

Rogers' Adoption Diffusion Model (1983) describes the late majority and laggards as more risk averse and skeptical of new ideas than innovators and early adopters. This suggests that the producers who did not invest in a contract cooperative (Non-member group) have different perceptions of the potential risk and return of investment.

#### **Long-term Return**

Using a five-point Likert scale (with 5=much higher and 1=much lower), producers were asked to compare the long-term return of cooperative investment with six other investment alternatives. Using one-way analysis of variance to compare the means among the three groups, significant differences were found for each of the six investments.

Compared to stocks, the Non-member group felt that cooperative stock would yield a lower return than did the Crop and Livestock groups ( $F=6.20$ ;  $p=.002$ ). Average responses for the Non-member, Crop, and Livestock groups were 2.78, 3.06, and 3.40, respectively. Compared to bonds, the Non-member group felt that cooperative investment would yield a lower return than did the Crop and Livestock groups ( $F=7.04$ ;  $p=.001$ ). Average responses for the Non-member, Crop, and Livestock groups were 2.88, 3.32, and 3.47, respectively. The Non-member group perceived that cooperative stock, compared to mutual fund investment, would yield a lower return than did the Livestock group ( $F=3.78$ ;  $p=.024$ ). Average responses for the Non-member, Crop, and Livestock groups were 2.82, 3.03, and 3.35, respectively.

Compared with certificates of deposit, the Non-member group perceived a lower return on cooperative investment than did the Crop and Livestock groups ( $F=8.18$ ;  $p=.000$ ). Average group responses comparing the return of certificates of deposit to cooperative investment were Non-member, 3.25; Crop, 3.83; and Livestock, 3.72.

Compared with land, the Non-member group perceived a lower return on cooperative stock than did the Crop group ( $F=9.22$ ;  $p=.000$ ). Average responses for the Non-member, Crop, and Livestock groups were 3.00, 3.59, and 3.32, respectively (Table 4.27).

The last evaluation of long-term return on cooperative investment pertained to other farm enterprises. Producers in the Non-member group perceived cooperative investment to yield lower returns than other farm investments than did the Crop and Livestock groups ( $F=9.36$ ;  $p=.000$ ). Average group responses for the Non-member, Crop, and Livestock groups were 3.08, 3.57, and 3.67, respectively (Table 4.27).

Table 4.27. Responses of Non-member, Crop, and Livestock Groups Comparing the Long-term Return on Cooperative Investment With Six Selected Investment Alternatives\*

Selected Variables	Non-mbr	Crop-mbr	Lvstk-mbr	F	p
Stocks	2.78	3.06	3.40	6.20	.002 <sup>a,b</sup>
Bonds	2.88	3.32	3.47	7.04	.001 <sup>a,b</sup>
Mutual funds	2.82	3.03	3.35	3.78	.024 <sup>b</sup>
Certificate of deposit	3.25	3.83	3.72	8.18	.000 <sup>a,b</sup>
Land	3.00	3.59	3.32	9.22	.000 <sup>a</sup>
Other farm enterprises	3.08	3.57	3.67	9.36	.000 <sup>a,b</sup>
N	77	116	35		

\*Means based on a 5-point Likert scale with 1=much lower and 5=much higher.

<sup>a</sup> = difference between Non-member and Crop member.

<sup>b</sup> = difference between Non-member and Livestock member.

### Long-term Risk

Rogers (1983) noted that innovators and early adopters are more comfortable with risk than the late majority and laggards. Using a five-point Likert scale where 1=much lower and 5=much higher, producers compared the long-term risk of cooperative investment with the six alternatives. Producers in the three groups did not perceive a difference between the long-term risk of stocks and cooperative investment ( $F=.07$ ;  $p=.930$ ). Compared with bonds, producers in the Crop group perceived higher risk in cooperative investment than did the Non-member group ( $F=5.06$ ;  $p=.007$ ). Average group responses comparing the risk of bonds and cooperative investment were Non-member, 3.16; Crop, 3.56; and Livestock, 3.26. Comparing cooperative stock to mutual funds, the Crop group perceived higher risks than did the Non-member group ( $F=3.93$ ;  $p=.021$ ). Average responses for the Non-member, Crop, and Livestock groups were 3.12, 3.43, and 3.11, respectively.

Comparing cooperative investment to certificates of deposit, the Crop group perceived higher long-term risk than did the Non-member group ( $F=9.19$ ;  $p=.000$ ). Average responses for the Non-member, Crop, and Livestock groups were 3.32, 4.00, and 3.59, respectively. Compared to land, producers in the Crop group also perceived higher risk in cooperative investment than did the Non-member group ( $F=3.38$ ;  $p=.036$ ). Average responses for the Non-member, Crop, and Livestock groups were 3.29, 3.61, and 3.31, respectively. Regarding other farm enterprises, members of the Crop group perceived higher risk in cooperative investment than did the Non-member and Livestock groups ( $5.98$ ;  $p=.003$ ). Average responses for the Non-member, Crop, and Livestock groups were 3.01, 3.36, and 2.94, respectively (Table 4.28).

Table 4.28. Responses of Non-member, Crop, and Livestock Groups Comparing the Long-term Risk of Cooperative Investment With Six Selected Investment Alternatives\*

Selected variables	Non-mbr	Crop-mbr	Lvstk-mbr	F	p
Stocks	3.03	3.07	3.03	0.07	.930
Bonds	3.16	3.56	3.26	5.06	.007 <sup>a</sup>
Mutual funds	3.12	3.43	3.11	3.93	.021 <sup>a</sup>
Certificates of Deposit	3.32	4.00	3.59	9.19	.000 <sup>a</sup>
Land	3.29	3.61	3.31	3.38	.036 <sup>a</sup>
Other farm enterprises	3.01	3.36	2.94	5.98	.003 <sup>a,c</sup>
N	77	114	35		

\*Means based on a 5-point Likert scale with 1=much lower and 5=much higher.

<sup>a</sup> = difference between Non-member and Crop member.

<sup>c</sup> = difference between Crop member and Livestock member.

### **Investment's Potential to Lower Long-term Marketing Risk**

Producers were asked to indicate the degree that they thought investment in a contract cooperative would lower long-term marketing risk. The average response for the Livestock group was significant from both the Non-member and Crop groups ( $F=3.98$ ;  $p=.020$ ). Livestock producers were more likely to perceive a lower long-term marketing risk as a result of investing in a contract cooperative. Average responses for the Non-member, Crop, and Livestock groups were 2.68, 2.55, and 2.17, respectively (Table 4.29).

Analysis of the nine question sets revealed significant differences in perceptions and attitudes toward contract cooperatives between the members and non-members. Analysis of variance identified the sub-groups that accounted for the differences. Therefore, the null hypothesis, that members and non-members have similar perceptions and attitudes toward contract cooperatives, is rejected.

H<sub>3</sub>: Contract Cooperative Members Have Higher Levels of Cooperative Participation Than Non-members.

Table 4.29. Responses of the Non-member, Crop, and Livestock Groups Regarding the Degree That Contract Cooperative Investment Lowers Long-term Marketing Risk\*

	Non-mbr	Crop-mbr	Lvstk-mbr	F	p
Investment lowers long-term marketing risk	2.68	2.55	2.17	3.98	.020 <sup>b,c</sup>
N	85	127	41		

\*Means based on 5-point Likert scale with 1=very large degree and 5=not at all.

<sup>b</sup> = difference between Non-member and Livestock member.

<sup>c</sup> = difference between Crop member and Livestock member.

### Average Number of Memberships

Producers were asked to report their number of memberships and the number yearly meetings attended for supply, commodity marketing, service, and sugar beet cooperatives. They were also asked to report whether they had ever served as a board member or delegate in the respective cooperative types. This section reports the findings on the three levels of cooperative participation for the three groups.

Producers in the Non-member group reported an average of 1.98 farm supply cooperative memberships compared with 2.45 for the Crop group and 2.20 for the Livestock group. This difference was significant between Non-member and Crop groups (F=3.86; p=.022). Non-member producers reported an average of 1.09 memberships in commodity marketing cooperatives compared with 1.57 for the Crop group and 1.31 for the Livestock group. The difference in commodity marketing memberships was significant between the Non-member and Crop groups (F=7.02; p=.001) (Table 4.30).

Table 4.30. Number of Memberships in Four Types of Agricultural Cooperatives for the Non-member, Crop, and Livestock Groups

Cooperative types	Non-mbr	Crop-mbr	Lvstk-mbr	F	p
Farm supply	1.98	2.45	2.20	3.86	.022 <sup>a</sup>
Commodity marketing	1.09	1.57	1.31	7.02	.001 <sup>a</sup>
Service	1.50	1.61	1.72	.44	.645
Sugar beet	0.02	0.25	0.07	18.47	.000 <sup>a,c</sup>
N	174	85	230		

<sup>a</sup> = difference between Non-member and Crop member.

<sup>c</sup> = difference between Crop member and Livestock member.

There was no significant difference in the number of service cooperative memberships among the three groups ( $F=.44$ ;  $p=.645$ ). The average number of service cooperative memberships for the Non-member, Crop, and Livestock groups were 1.50, 1.61, and 1.72, respectively. Average memberships in sugar beet cooperatives for the Non-member, Crop, and Livestock groups were .02, .25, and .07, respectively. Average memberships for sugar beet processing cooperatives were low because of the region-specific nature of these businesses. For this type of cooperative, the Crop group reported significantly more memberships than did the Non-member and Livestock groups ( $F=18.47$ ;  $p=.000$ ) (Table 4.30).

### **Board Member or Officer in Cooperatives**

Producers were asked to report if they had ever served as a board member or officer in each of the four types of cooperatives. The “yes” or “no” response yielded nominal level data requiring a cross-tabulation procedure for analysis.

Of the 150 producers in the Non-member group, 32.0 percent reported serving as a board member or other officer for a supply cooperative, compared to 28.1 percent of the

Crop producers and 19.5 percent of the Livestock producers. There was no significant difference among the three groups ( $\chi^2=4.13$ ;  $p=.126$ ;  $\eta^2=.10$ ) (Table 4.31).

Table 4.31. Number of Non-member, Crop, and Livestock Producers Who Served as Board Members or Other Officers in Farm Supply Cooperatives

Supply officer?	Non-mbr		Crop-mbr		Lvstk-mbr		Statistics
	N	%	N	%	N	%	
Yes	48	32.0	61	28.1	16	19.5	$\chi^2 = 4.13$ $p = .126$ $df = 2$ $= .10$
No	102	68.0	156	71.9	66	80.5	
N	150	100	217	100	82	100	

Over 17 percent of the Non-member producers served as a board member or officer in a commodity marketing cooperative compared to 25.3 percent and 20.3 percent for the Crop and Livestock groups, respectively. There was no significant difference among the three groups regarding board or officer participation in commodity marketing cooperatives ( $\chi^2=2.55$ ;  $p=.279$ ;  $=.08$ ) (Table 4.32).

Table 4.32. Number of Non-member, Crop, and Livestock Producers Who Served as Board Members or Other Officers in Commodity Marketing Cooperatives

Commodity officer?	Non-mbr		Crop-mbr		Lvstk-mbr		Statistics
	N	%	N	%	N	%	
Yes	18	17.3	44	25.3	14	20.3	$\chi^2 = 2.55$ $p = .279$ $df = 2$ $= .08$
No	86	82.7	130	74.7	55	79.7	
N	104	100	174	100	69	100	

Nearly 15 percent of the Non-member producers reported serving as a board member or other officer in a service cooperative, compared with 10.5 percent of the Crop producers and 10.4 percent of the Livestock producers. There were no significant differences among the three groups ( $\chi^2=1.42$ ;  $p=.493$ ;  $\eta^2=.06$ ) (Table 4.33).

Table 4.33. Number of Non-member, Crop, and Livestock Producers Who Served as Board Members or Other Officers in Service Cooperatives

Service officer?	Non-mbr		Crop-mbr		Lvstk-mbr		Statistics
	N	%	N	%	N	%	
Yes	19	14.7	18	10.5	7	10.4	$\chi^2 = 1.42$ $p = .493$ $df = 2$ $\eta^2 = .06$
No	110	85.3	153	89.5	60	89.6	
N	129	100	171	100	67	100	

None of the Non-member or Livestock producers reported serving as a board member or other officer for a sugar beet processing cooperative. Over 15 percent of the Crop group reported serving as a board member or other officer in a sugar beet cooperative. There were no significant differences among the three groups ( $\chi^2=.88$ ;  $p=.646$ ;  $\eta^2=.12$ ) (Table 4.34).

Table 4.34. Number of Non-member, Crop, and Livestock Producers Who Served as Board Members or Other Officers in Sugar Beet Processing Cooperatives

Sugar Beet Officer	Non-mbr		Crop-mbr		Lvstk-mbr		Statistics
	N	%	N	%	N	%	
Yes	-	-	8	15.1	-	-	$\chi^2 = .88$ $p = .646$ $df = 2$ $\eta^2 = .12$

No	3	100	45	84.9	2	100
N	3	100	53	100	2	100

### Number of Meetings Attended

The third measure of participation in agricultural cooperatives was the number of meetings producers attended each year for the four types of cooperatives (Table 4.35). The average number of meetings attended by Non-member, Crop, and Livestock group members for each type of cooperative was computed using only those producers who reported memberships in the specific cooperatives.

Table 4.35. Number of Meetings Attended by Non-member, Crop, and Livestock Groups in 1995 for Four Types of Agricultural Cooperatives\*

Selected Cooperatives	Non-mbr	Crop-mbr	Lvstk-mbr	F	p
Farm Supply	4.49	4.52	2.70	2.88	.057
Commodity marketing	2.40	4.03	3.34	3.30	.038 <sup>a</sup>
Service	1.89	2.28	2.12	.24	.788
Sugar beet processing	3.67	5.41	0.00	.24	.789
N	150	82	217		

\*Means based on the total number of meeting attended for type of cooperative in 1995.

<sup>a</sup> = difference between Non-member and Crop member.

Producers in the Livestock group reported fewer memberships in farm supply cooperatives than did producers in the Non-member and Crop groups. This difference was not significant ( $F=2.88$ ;  $p=.057$ ). The average number of meetings attended for farm supply cooperatives for the Non-member, Crop, and Livestock groups was 4.49, 4.52, and 2.70, respectively.

Producers in the Crop group reported attending significantly more meetings for commodity marketing cooperatives than did producers in the Non-member group ( $F=3.30$ ;

$p=.038$ ). The average number of commodity marketing cooperative meetings attended for the Non-member, Crop, and Livestock groups was 2.40, 4.03, and 3.34, respectively.

The average number of service cooperative meetings attended for the three groups was not significant ( $F=.24$ ;  $p=.788$ ). The average number of service cooperative meetings attended for the Non-member, Crop, and Livestock groups was 1.89, 2.28, and 2.12, respectively.

The average number of meetings attended for sugar beet processing cooperatives was not significant ( $F=.24$ ;  $p=.789$ ). The average number of sugar beet processing cooperative meetings attended for the Non-member, Crop, and Livestock Groups was 3.67, 5.41, and 0.00, respectively (Table 4.35).

While average group memberships of three of the four cooperative types were significant, the Livestock group did not differ from the Non-member group. In addition, only one of the eight measures of officer participation and meeting attendance was significant. Therefore, the hypothesis that members have higher levels of cooperative participation was only partially supported.

## **CHAPTER 5. DISCUSSION AND CONCLUSIONS**

The purpose of this study was to identify the differences between producers who invest in contract cooperatives and those who do not. North Dakota producers were surveyed in the spring of 1996 to collect quantitative data regarding contract cooperatives.

The producers were segmented into three groups. The Crop group (N = 230) contained members of the corn and wheat processing cooperatives. The Livestock group (N = 85) contained members of the milk and bison processing cooperatives. The Non-members were not segmented, resulting in a group of 174 producers.

Significant differences in attributes and attitudes were identified between the non-member and member groups. Tables I.1, I.2, and I.3 list the expected direction of the independent variables for the three general hypotheses.

Selected results regarding the three general hypotheses are discussed in this section. Methodological suggestions for future research on contract cooperatives follow.

### **Discussion**

This research determined that both the producers' personal and farm organization characteristics and attitudes toward contract cooperatives were important to their decision to invest. While measures of cooperative participation were significant, producer attributes and attitudes may be more prominent in characterizing the members in contract cooperatives from the non-members. Selected findings pertaining to the three general hypotheses will be discussed in the context of their theoretical foundations.

## **Personal and Farm Organizational Characteristics**

Rogers' (1983) Adoption Diffusion Model regards the individual producer as a decision maker whose rate of adoption and adoption behavior are influenced by personal characteristics and farm organizational characteristics. Therefore, it was hypothesized that

H<sub>1</sub>: Contract cooperative members differ in both personal and farm organizational characteristics from the non-members.

Analysis of these attributes revealed significant and substantive differences in attributes between the members and non-members. Therefore, the null hypothesis, that there are no differences in attributes between the two groups, is rejected.

**Personal Characteristics.** Differences in the producers' ages, years farming, and highest educational level were significant. The younger age of the members has two implications. First, the nature of the contract cooperative ventures suggests that it will take several years for them to reach stable profits and influence the value of the shares. Therefore, younger farmers may feel more comfortable with the amount of time necessary for the investment to reach its potential. Second, the Capper-Volstead Act of 1922, which clarified anti-trust treatment of farmers' cooperatives (Cobia 1989), requires that cooperative members be active producers at risk for production. Under this law, only active producers may own shares in a contract cooperative. This requirement may have inhibited older farmers, nearer to retirement, from investing as they would have to sell the shares even if there was a financial benefit in retaining them. The age difference between members and non-members supports the age difference in Rogers' (1983) five adopter categories.

Wadsworth (1991) found no significant relationship between farm operator age and use of traditional cooperatives. In contrast, Kraenzle (1989) determined that a higher percentage of younger farmers used traditional cooperatives for greater percentages of their marketing and input needs than did older farmers. The time required for return on

investment, as well as the Capper-Volstead requirements, suggests that the age of the producer has a different role in membership in contract cooperatives than in traditional cooperatives. While Rogers (1983) conceptualized age solely as an adopter characteristic, it may have further influence on the attributes of the contract cooperative innovation. In the contract cooperative investment decision, age may affect the compatibility with the attributes of the cooperative.

The higher education levels of the adopters (contract cooperative members) is consistent with other Adoption Diffusion-oriented studies and the characteristics of the five adopter categories. However, in general, younger people achieve higher levels of formal education than do older people.

**Financial Characteristics.** Direct investment requirements imply that financial characteristics (and one's ability to finance an investment) may be more important in the decision process than farm size. In a traditional cooperative, farm size determines the level of patronage. In contrast, a producer's ability to invest is more indicative of membership in a contract cooperative than farm size. The significant differences in financial variables between the members and non-members were consistent with the dominant characteristics Rogers (1983) identified in the five adopter categories.

The financial condition of the members suggest that they are more able to withstand the potential of holding the investment through several years of no return. Rogers (1983) noted that innovators and the early adopters were more able to absorb possible losses from an innovation, whereas the remaining categories were more cautious in adopting innovations due, in part, to their limited resources.

The direct investment requirements to obtain delivery rights and obligations to a contract cooperative may require financing through a financial institution. This suggests that financial variables are vital to the producer's ability and decision to invest.

Producers in the Non-member group reported interest expenses of \$32,330 on liabilities of \$161,706, or a ratio of 1:5. Producers in the Crop group reported interest expenses of \$27,330 on liabilities of \$248,514, or a ratio of 1:9. Producers in the Livestock group reported interest expenses of \$21,988 on liabilities of \$149,288, or a ratio of 1:7. This suggests that the Non-members pay a higher rate of interest on loans than the members. It follows that members more likely receive favorable terms on cooperative stock loans than non-members, thus influencing their decision to invest.

**Crop and Livestock Production Practices.** Members planted significantly more acres of nine crops than did the Non-members in 1995. Members were also more likely to increase acreage and add a new crop for a contract cooperative investment than producers in the Non-member group.

While there were no significant differences in the number of livestock raised among the three groups, producers in the Livestock group were more likely to increase the number of head for a contract cooperative investment. The cross-tabulations of production characteristics and expectations had low-to-medium levels of association. However, the moderate differences among the Non-member, Crop, and Livestock groups conform with Rogers' (1983) description of the adopter categories.

Rogers (1983) conceptualized the adoption decision as a process that accounted for the attributes of the individual and the attributes of the innovation. This study identified significant differences in both personal and farm organizational characteristics between the members and non-members which conform with Rogers' (1983) five adopter categories.

### **Perceptions and Attitudes Toward Contract Cooperatives**

The use of direct investment, limited number of delivery rights, and delivery contracts differentiate contract cooperatives from traditional cooperatives. Rogers (1983) developed five characteristics by which an innovation can be described and discussed how

an individual perceptions of these characteristics predict their rate of adoption. The five attributes, relative advantage, compatibility, complexity, trialability, and observability, were used as a guide to ascertain producer attitudes toward contract cooperatives. It was hypothesized that

H<sub>2</sub>: Members have different perceptions and attitudes about contract cooperatives than non-members.

Analysis of nine question sets revealed significant differences in perceptions and attitudes toward contract cooperatives between members and non-members. Therefore, the null hypothesis, that members and non-members have similar perceptions and attitudes toward contract cooperatives, is rejected.

Producers' perceptions of themselves influence their attitudes toward contract cooperatives and their decisions to invest. Although producers in the Non-member, Crop, and Livestock groups perceived themselves as in the food production business, perceptions differed when asked about their roles in food processing, transportation, marketing, wholesale, and retail businesses.

Producers in the Livestock and Crop groups expected to spend more time on food commodity production, processing, transportation, marketing, wholesale, and retail roles in the future than did producers in the Non-member group. These two related sets of perceptions and the differences between the Non-member, Crop, and Livestock groups suggest that members and Non-members have different goals and needs.

Producers in the Crop and Livestock groups more strongly believed that the contract cooperatives would meet selected objectives than did producers in the Non-member group. That is, members perceive a higher relative advantage to joining a contract cooperative than their current strategies. Producers in the Non-member group had more negative attitudes toward the contract cooperatives than did producers in the member

groups. These systematic differences suggest that contract cooperatives are not compatible with the Non-members' existing values, past experiences, and needs.

Producers in the Non-member group more strongly agreed that the required investments were too high. This suggests that Non-members perceived a lower degree of trialability, the degree to which an innovation may be experimented with on a limited basis. Trialability is positively related to an innovation's rate of adoption (Rogers 1983).

Rogers (1983) noted that innovations that are perceived as having greater relative advantage, compatibility, trialability, observability, and less complexity will be adopted more rapidly than other innovations. The producer's perceived role in the agricultural industry and resulting attitudes toward contract cooperatives support Rogers' use of these five attributes.

The attitudinal differences among the Non-member, Crop, and Livestock groups suggest that members perceive higher relative advantage and compatibility of contract cooperatives than do Non-members. It follows that members perceive higher long-term returns on cooperative investment when compared to alternatives than did the Non-members. However, the members also perceived higher risk of contract cooperative investment on five alternatives than did the Non-members.

### **Perceived Risk of Investment**

Under the general hypothesis that members would have different perceptions and attitudes toward contract cooperatives than Non-members, members were expected to perceive a lower risk of cooperative investment compared to six investment alternatives than Non-members.

Using the five adopter categories, Rogers (1983) characterized the innovators and early adopters as less risk averse than the early and late majority and laggard categories. The innovator's higher tolerance for risk was misinterpreted as perceiving lower risk in adoption than the other categories. Rather, producers in the Crop and Livestock groups

are more comfortable with the higher long-term risk of investment than are producers in the Non-member group. Thomas et al. (1990) confirmed that early adopters are greater risk takers than late adopters.

Rogers (1983) also identified venturesomeness and eagerness to try new ideas as dominant characteristics of innovators. This research determined that the Crop and Livestock groups perceived themselves as active in more roles in the agricultural industry than did producers in the Non-member group. The risk of contract cooperative investment reflects their perceived additional roles. This is consistent with Rogers' characterization of adopter categories.

### **Implication**

The prevalence of new and proposed contract cooperatives on the Northern Plains has been called "Co-op Fever," reflecting the enthusiasm for the new businesses. In light of the success of the sugar beet and corn wet milling contract cooperatives, Peterson (1994) noted the negative effects of grand expectations. Optimistic producers lost their investment trying to get in on the ground floor of the next wonder crop and its processing cooperative. Stefanson et al. (1995) discussed the importance of a support network in contract cooperative developments, noting that they create an atmosphere of enthusiasm that is contagious. New contract cooperatives, with unsound business plans and unrealistic objectives, could conceivably be capitalized in this aura of enthusiasm. However, this research suggests that members are well aware of the inherent risks associated with investment in contract cooperatives. Further, analysis of the importance the Crop, Livestock, and Non-member groups placed on investment considerations revealed few significant differences. This suggests that the decision process to invest for members and non-members alike is not misguided by unrealistic expectations or undue enthusiasm.

### **Cooperative Participation**

Coleman's Social Capital Theory (1988) addresses social structures that facilitate action and influence actors. The concept of closure is the result of high information flow in closed groups facilitated by strong relationships. Closure enables group action. Therefore, this concept was isolated and operationalized in this study by measuring one dimension of group closure, cooperative participation. It was hypothesized that

H<sub>3</sub>: Contract cooperative members have higher levels of cooperative participation than non-members.

Producers in the Crop group reported significantly more memberships in farm supply, commodity marketing, and sugar beet processing cooperatives. The Livestock group's significantly fewer memberships in sugar beet cooperatives is explained by the regional differences in sample selection. While three of the four cooperative memberships differed, the Livestock producers did not differ from the Non-member producers.

Only one of the eight measures of officer participation and meeting attendance was significant. This reflects the marginal significance of cooperative memberships. The differences were not viewed to be substantive. Therefore, the hypothesis that members have higher levels of cooperative participation was only partially supported.

### **Methodological Suggestions for Future Research**

The social element of traditional cooperatives offered a measurable and valid dimension of closure. However, traditional cooperative participation may have been inappropriate since the contract cooperatives differ markedly in structure and objectives. Further, the newness and different objectives of the contract cooperatives draw on investment from different producers and new clientele from outside the traditional cooperatives' trade area. Whereas traditional cooperatives are based on a geographic

orientation, proximity to the contract cooperative appears to be less important in the investment decision.

Considerable time and effort was spent to maintain eight separate producer groups (four member and four non-member). In addition, response rates were recorded for each of the groups. It was anticipated that cooperative managers who provided membership lists would examine the member and non-member data for their respective cooperatives. The initial sample was designed to allow a 90 percent confidence level analysis for the individual group data. However, the low response rates (few completed cases) did not allow for generalizable analysis for six of the groups. Furthermore, individual analysis was not requested. Therefore, future research could forego the effort to maintain individual groups.

Managers of the four cooperatives were asked to provide lists of producers who attended informational meetings or were potential members, if available. Two provided these lists. The assumption in requesting these lists was that attendees were more engaged in the contract cooperative decision and were more likely than non-attendees to invest. The telephone interview procedure revealed a higher rate of retired farmers or non-farmers on the provided lists than the non-member lists developed from trade association random sample lists.

Simple random samples provided by the trade associations were satisfactory sources for the non-member sample. However, many of the proposed contract cooperatives focus on new or specialty crops which have a low producer base or lack an association to provide producer names. Future researchers must recognize the importance and implications of the sources used to develop their sampling frames.

The cross-check to maintain the non-member groups revealed that the non-members reported being invited to join a cooperative other than the one for their commodity or none at all.

The sampling methodology was designed to yield 300 member cases and 300 non-member cases. Of the 577 producers in the member sample, 321 (55.6 percent) completed the telephone interview, of which 191 (59.5 percent ) returned the questionnaire. In contrast, only 232 of the 593 (39.1 percent) producers in the non-member sample completed the telephone interview, of which 127 (54.8 percent) returned the questionnaire. The 16.5 percent lower non-member response rate may be due, in part, to Dillman's (1978) observation that respondents are more likely to participate if the topic interests them. Similarly, the member mail-out/mail-back questionnaires (Form A) were more thoroughly completed than the non-member mail-out/mail-back questionnaires (Form B). Pretesting revealed that the member form took eight to ten minutes to complete, compared with four to five minutes for the non-member form.

Future contract cooperative studies should recognize the lower response rates and engagement of the non-members when developing their methodology and sampling design. One way to develop a sufficient number of non-member cases is to increase the sampling size. However, this causes problems for future research. A more appropriate way would be to minimize response bias in part through a shorter, single survey instrument that could focus more on their reasons for non-investment and encourage their comments as to why they may not be interested in contract cooperatives.

The 44 producers who did not identify the contract cooperative in which they had memberships were excluded from the analysis. This group was independently analyzed and found to be systematically different from both the member and non-member groups. Their personal and farm organization characteristics were between the member and non-member groups. Similarly, their perception of their role in agriculture and attitudes toward contract cooperatives were between the member and non-member groups. This group illustrates the difficulty in operationalizing a contract cooperative to respondents. In addition, some ventures originally proposed as contract cooperatives were financed as

limited liability corporations. A thorough list of all contract cooperatives in each region of North Dakota provided for the telephone interviewers may have reduced the uncertainty and increased the number of usable cases.

While the use of an external telephone research firm expedited completion of the interviews, future researchers must recognize the latent effects. Several respondents noted frustration with the interviewers' lack of knowledge about agriculture. Given the length of the interview and follow-up questionnaire, this may have contributed to incomplete interviews. A high priority was placed on the number of completions. This environment encouraged more aggressive techniques than those used by in-house interviewers. In addition, the use of a follow-up questionnaire required more coordination than was usually necessary. The duties and expectations of each party should be identified and agreed upon before the project is started. The benefits of a short completion time must be weighed against the potential impact of an external telephone research firm.

Contract cooperative members and non-members were asked to complete their respective mail-out/mail-back questionnaire with one cooperative in mind. Their responses were one means to develop the dependent variable groups. Producers who invested in or were invited to join more than one contract cooperative may have answered the questions using various experiences. It may have been difficult to isolate one contract cooperative experience. However, the percent of producers who were involved in more than one cooperative was relatively low. Future research should weigh the benefits of isolating one cooperative and maintaining the specific groups.

Much has been written about the prevalence and early success of the contract cooperatives on the Northern Plains. Social Capital Theory offers potential to explain why or how contract cooperative developments are more prevalent on the Northern Plains. The established objectives of this research project limited the amount of space to address specific hypotheses generated from Social Capital Theory. Furthermore, Hatlen (1994)

and Flora et al. (1995) illustrate the difficulty in operationalizing social capital variables. The necessary rigor would have made the survey instruments very abstract. Furthermore, the methodological approach may not have been the most appropriate from which to test this theory. The research of Flora et al. (1995) addressed macro-level variables in different regions, whereas the cooperative membership study focused on personal attributes and attitudes of members and non-investors from the same region. Future research addressing the role of social capital in contract cooperative developments should compare communities or regions with a contract cooperative to regions without contract cooperatives. The Flora et al. (1995) data could be a potential source of secondary data for regions without contract cooperative developments. Contract cooperative feasibility studies and community proposals to draw processing facilities could provide preliminary data from Northern Plains communities with a contract cooperative.

The length of the mail-out/mail-back questionnaires, combined with the telephone interview, was not conducive to member and non-member comments. Consequently, new insights and perspectives not addressed in this methodology may not have been voiced. Cooperative researchers should use the member and non-member comments from this study to guide future contract cooperative membership studies.

### **Conclusion**

This study identified systematic differences in personal and farm organizational characteristics between contract cooperative members and non-members that conform with Rogers' (1983) five adopter categories. Contract cooperative members perceived themselves differently in the agricultural industry than did the non-members. Their different perceived roles are linked to and may explain their systematic differences in attitudes toward contract cooperatives. The differences in attributes and attitudes appear to be more prominent in characterizing the two groups than levels of cooperative participation.

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## APPENDIX A. INTRODUCTORY LETTER

March 1, 1996

Dear :

The growth in the number of cooperatives in North Dakota has received much attention recently. We're conducting a project to learn more about the impact and role cooperatives play in rural North Dakota, and thus to enhance the quality of life in our state. We're anxious to get your opinions about the new, value-added cooperatives that have been organized in the state, whether you've invested in them or not. Your participation in the project is critical.

Here's how you can help. In a few days, we'll contact you by phone to ask a set of questions. We selected this time of the year hoping to catch you before you're too busy preparing for fieldwork. Our visit should take only about 10 minutes. We don't want to overstay our welcome on the phone, so after the visit we'll follow up by sending a final set of questions for you to answer and mail back.

The telephone and mail questions will pertain to your attitudes about agricultural cooperatives, your involvement with them, and your thoughts about co-op investments. We'll ask a few questions about you and your farm, including a couple of financial questions (gross income, farm expenses, cooperative distributions, and interest expenses). These can be pulled from your 1040 Schedule F. It would be helpful if you checked these figures ahead of time.

Please be assured that the information you provide will be kept **strictly confidential**. All of your answers will be combined with those of the other people in the study so that no single person can be identified. It's our policy not to disclose your name in any report, or to give your individual answers to anyone.

If you have questions about the study, please feel free to contact me at the address or the phone number listed above. Thank you in advance for your willingness to help with this project.

Sincerely,

Dr. David W. Cobia  
Director

## APPENDIX B. SURVEY LETTER

Date

Dear Participant:

Thank you for the recent telephone visit about agricultural cooperatives. The information you provided was extremely helpful. We were pleased with the overwhelmingly positive response we received from you and the scores of other North Dakotans who shared information with us.

As mentioned, we didn't want to take too much of your time on the phone, so we are mailing the last set of questions for you to answer. The questions pertain to your thoughts and opinions about the new, value-added cooperatives. The information will be used to better understand the role these cooperatives play on our rural communities and in the lives of rural residents.

Please try to complete them and mail the form back to us in the enclosed envelope within the next one or two days. It should take only about 10 minutes to complete the questions. Remember that your answers will be kept **strictly confidential**. All of your answers will be combined with those of the other people in the study so that no individual person can be identified. We will not disclose your name in any report or give your individual answers to anyone.

If you have questions about any of the items on the form, please feel free to contact me. I'd be happy to discuss them with you. Again, thank you very much for participating in this major, statewide project.

Sincerely,

David W. Cobia  
Director

encl.

## APPENDIX C. POSTCARD REMINDER

Dear North Dakota Farmer:

We recently mailed a form to you about agricultural cooperatives in North Dakota. The information will be used to help rural residents make wise decisions regarding cooperative involvement.

If you already completed and returned the form, please accept our sincere thanks. If not, we would appreciate getting your responses. They will be kept **strictly confidential** and will be combined with those of other people in the state so that no individual can be identified.

If you have not received the survey or if it was misplaced, please call me at 701-231-7446. I will be happy to send you a copy.

Sincerely,  
David W. Cobia, Director

## APPENDIX D. THIRD LETTER

Date

Dear :

About three weeks ago, we mailed a survey to you about the new, value-added co-ops in North Dakota. As of today, we haven't received your completed form. Perhaps you already completed it and our correspondence crossed in the mail; if so, thank you for participating in the study. In case you didn't receive our first mailing or misplaced it, I've enclosed an additional form for your convenience.

Your participation is critical. With your help, we will better understand how the new cooperatives may affect our rural communities and the lives of rural residents. Our goal is to enhance the quality of life of rural North Dakotans.

Please be assured that all of your answers will be kept in **strict confidence**, and will be combined with those of all the other people around the state who have responded so that no individual can be identified. I'll be happy to answer any questions you may have regarding this study. Please feel free to contact me at 701-231-7446. Your participation is greatly appreciated.

Sincerely,

Dr. David W. Cobia  
Director

encl.

## APPENDIX I. EXPECTED DIRECTION OF INDEPENDENT VARIABLES

Table I.1. Expected Direction of Personal and Farm Organizational Independent Variable Sets

Independent Variable Sets	Expected Direction	
	Non-mbr	Member
<b>Personal Characteristics</b>		
Years been a farmer	High	Low
Age	High	Low
Highest educational level	Low	High
Years before retirement	Low	High
<b>Farm Size</b>		
Acres owned	Low	High
Acres rented	Low	High
Acres rented out	High	Low
Total operation size	Low	High
<b>Farm Financial Characteristics (1995)</b>		
Gross farm income	Low	High
Total farm expenses	Low	High
Total cooperative distributions	Low	High
Total interest expenses	Low	High
Total farm assets	Low	High
Total farm liabilities	Low	High
Off-the-farm income	Low	High
Total family income	Low	High

(continued)

Table I.1. (continued)

Independent Variable Sets	Expected Direction	
	Non-mbr	Member
<b>Crop Production</b>		
Did you raise crops in 1995?	Yes	Yes
Average Acreage of crops grown	Lower	Higher
Increase acreage in next 5 years	No	Yes
Increase what crop(s)		
Increase due to co-op investment	No	Yes
Add new crop in next 5 years	No	Yes
Add what crop(s)		
Addition due to co-op investment	No	Yes
<b>Livestock Production</b>		
Did you raise livestock in 1995?	Yes	Yes
Average number of head raised	Lower	Higher
Increase livestock in next 5 years	No	Yes
Increase what livestock		
Increase due to co-op investment	No	Yes
Add new livestock in next 5 years	No	Yes
Add what livestock		
Addition due to co-op investment	No	Yes

Table I.2. Expected Direction of Independent Variable Sets Regarding Producers' Perceptions and Attitudes Toward Contract Cooperatives

Independent Variable Sets	Expected Direction	
	Non-mbr	Member
<b>After You Retire, Would One of your Sons, Daughter, or Other Family Members Like to...</b>		
Take over the family farm	No	Yes
<b>Farmers' Perception of Their Role in the Agriculture Industry I'm in the... (Likert scale)</b>		
Food production business	Agree	Agree
Food processing business	Disagree	Agree
Food transportation business	Disagree	Agree
Food marketing business	Disagree	Agree
Food wholesale business	Disagree	Agree
Food retail business	Disagree	Agree
<b>Amount of Time Farmers Believe They Will Spend on Selected Agricultural Roles in the Future (Likert scale)</b>		
Food commodity production	Same	Increase
Food commodity processing	Same	Increase
Food commodity transportation	Same	Increase
Food commodity marketing	Same	Increase
Food commodity wholesale	Same	Increase
Food commodity retail	Same	Increase

(continued)

Table I.2. (continued)

Independent Variable Sets	Expected Direction	
	Non-mbr	Member
<b>How Often Farmers Believe That the Contract Cooperatives Will Accomplish Selected Objectives</b> (Likert scale)		
Increase farm income	Never	Often
Reduce marketing risk	Never	Often
Gain access to value-added markets	Never	Often
Network with people	Never	Often
Increase knowledge/information	Never	Often
Provide new services to farmers	Never	Often
Increase farm productivity	Never	Often
Have a consistent outlet for product	Never	Often
Purchase shares low; sell higher	Never	Often
<b>Farmers Attitudes Toward the New, Value-adding Contract Cooperatives</b> (Likert scale)		
Required investments are too high	Agree	Disagree
They benefit only wealthy farmers	Agree	Disagree
Delivery contracts are too strict	Agree	Disagree
Farmers shouldn't own food co.s	Agree	Disagree
They are get-rich-quick schemes	Agree	Disagree
Used as last-ditch efforts to survive	Agree	Disagree
They can't compete with IOFs	Agree	Disagree
Managers have too much control	Agree	Disagree

They offer inferior quality products	Agree	Disagree
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(continued)

Table I.2. (continued)

Independent Variable Sets	Expected Direction	
	Non-mbr	Member
<b>Level of Importance Producers Place on Selected Items When Considering an Investment in a Contract Cooperative</b> (Likert scale)		
Intended location of plant	High	Low
Professional feasibility study	Low	High
Marketing plan	Low	High
Media coverage	High	Low
Offering circular or prospectus	High	High
Concerns about level of risk	High	Low
Potential to make a profit	Low	High
Membership conditions	High	Low
Initial cost of the investment	High	Low
Planning committee members	High	Low
Have a stable market outlet	High	High

(continued)

Table I.2. (continued)

Independent Variable Sets	Expected Direction	
	Non-mbr	Member
<b>How Farmers Think the New Contract Cooperatives Compare With Selected Alternative Investments In Their Long-term Return on Investment (Likert scale)</b>		
Stocks	Lower	Higher
Bonds	Lower	Higher
Mutual funds	Lower	Higher
CD's	Lower	Higher
Land	Lower	Higher
Other farm enterprises	Lower	Higher
<b>How Farmers Think the New Contract Cooperatives Compare With Selected Alternative Investments In Their Long-term Risk of Investment (Likert scale)</b>		
Stocks	Higher	Lower
Bonds	Higher	Lower
Mutual funds	Higher	Lower
CD's	Higher	Lower
Land	Higher	Lower
Other farm enterprises	Higher	Lower
<b>Degree to Which Farmers Feel that Contract Cooperative Investment Lowers... (Likert scale)</b>		
Long-term marketing risk	Small degree	Large degree

Table I.3. Expected Direction of Independent Variable Sets Regarding Cooperative Participation

Independent Variable Sets	Expected Direction	
	Non-mbr	Member
<b>Number of Memberships in Four Types of Agricultural Cooperatives</b>		
Farm supply memberships	Low	High
Commodity mktg. memberships	Low	High
Service memberships	Low	High
Sugar beet memberships	Low	High
<b>Served as Officer in Four Types of Agricultural Cooperatives?</b>		
Farm supply officer	No	Yes
Commodity mktg. officer	No	Yes
Service co-op officer	No	Yes
Sugar beet co-op officer	No	Yes
<b>Number of Yearly Meetings Attended for Four Types of Agricultural Cooperatives</b>		
Farm supply meetings	Low	High
Commodity mktg. meetings	Low	High
Service co-op meetings	Low	High
Sugar beet co-op meetings	Low	High