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Producer Perceptions of Hog Marketing Cooperatives

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A survey instrument was developed to elicit information useful in characterizing the membership of hog marketing cooperatives and to identify benefits and costs expected and perceived by members. An empirical application investigates the role of marketing cooperatives in the Illinois pork industry. Producers in general agreed there were benefits of membership in a hog marketing cooperative although perceptions of the nature and extent of these benefits varied. Important differences were identified between perceptions of producers with small operations and those held by other producers.

"When the result is greater than the sum of its parts, it is either synergy or bad math."

Myrtle Maganded, *Four Summers*, Unpublished Manuscript

Introduction

Evolution of the U.S. Pork Industry

Structural changes in agriculture have continued to accelerate for a multitude of reasons discussed and debated throughout both the popular and academic literature. The pork industry is no exception. Although production still remains regionally concentrated, hog numbers in the Midwest have continued to decline, replaced by expansion in Southeastern and Western states, states traditionally less important in pork production (Hurt 1994). Of particular note is expansion in North Carolina. In 1997, at 8.6 million animals, North Carolina had more hogs than any other state except Iowa. Four of the top ten counties in hog inventory (and nine of the top twenty) were located in North Carolina. During the 1990s, so called super producers, those marketing more than 50,000 animals annually, were attracted to this and other states not traditionally important in hog production because they offered thinly populated areas and lower cost resources (land, labor, facilities). Producers in the Southeast were also more familiar with the

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contract production system used by these firms because of previous exposure in the poultry industry in this region (Rhodes 1995; Hurt 1994).

The pork industry also continues to become concentrated on fewer and larger farms (Lawrence et al. 1994; Barkema and Cook 1993). In 1998, the 1.7 percent of U.S. hog operations in the more than 5,000 animals category had 42 percent of U.S. inventory. The 5.9 percent of operations that had more than 2,000 animals housed 63.5 percent of U.S. inventory. The distribution of operation size differs by region. In the traditional hog production state of Iowa, for example, 50 percent of operations market less than 2,000 hogs annually, and only 26 percent market more than 5,000. The distribution is almost identical in Illinois. In North Carolina, only 6 percent of operations market less than 2,000 hogs annually, and 72 percent market over 5,000.

Evolution of the structure and other characteristics of the pork industry are the result of changes both internal and external to the industry (Hogeland 1995; Barkema and Cook 1993; Spinelli 1991; Wilson and Eidman 1985). Until the 1950s, pork was the meat of choice in the United States. The industry was labor intensive and many hogs were raised on pasture. Most farms that raised hogs were also producing grain. Technological advances in machinery, chemicals, fertilizer, and seed, and farm commodity programs ensuring a minimum price for grains encouraged producers to grow more grain and fewer hogs. The result was more specialized farms, with hogs and crops increasingly produced independently (Lawrence et al. 1994; Shapouri, Mathews, and Bailey 1994; Rhodes and Grimes 1991). Further influencing industry structure were strong competition in the meat industry as the cost of chicken continued to decrease relative to beef and pork, and consumer lifestyle and buying preference changes. Both helped fuel the development and adoption of new technologies to reduce cost in, and improve products of, the pork industry. Farmers who decided to keep producing hogs adopted new technologies such as confinement feeding to decrease land requirements and increase labor efficiency (Shapouri, Mathews, and Bailey 1994). The capital intensive and concentrated industrial structure of today's pork industry resulted.

Impact on Small Hog Farms

One important consequence of the industry's evolution has been the out-migration of smaller operations (Hurt 1994; Van Arsdall and Nelson 1985). Rhodes (1995) and others argue that, to be successful, firms must have access to and be able to quickly adapt/use market information, be specialized in one or a limited number of enterprises as this allows for technology adoption and efficient use of information, have access to all production inputs including capital, and produce the quality and volume of hogs that attract packers. These are less often characteristics of small operations.

Today's producers with small and medium sized operations are faced with a series of challenges associated with production and marketing economies. Producers must identify production alternatives by which to capitalize on advantages associated with spreading fixed costs over more animals. While there is not widespread agreement on the extent and source of economies of size in hog production (Ginder 1995a), there is general agreement that they exist (Rhodes 1995; Hurt 1994; Dubman and Hanson 1989; Van Arsdall and Nelson 1985; Stillman 1984). And, while some investigators have found that the cost and return advantages for large operations are not great, it is clear that firms have yet to reach a size facing diseconomies (Rhodes 1995). A key source of economies of size is the ability to spread the cost of capital and human investment in technology over more animals. While technologies are available to all producers, the education, knowledge, and experience required to implement them and the capital

necessary to invest in them have prevented or delayed their adoption by producers with smaller operations (Fulton and Gillespie 1995; Hogeland 1995; Hurt 1994; Rhodes 1994; Lawrence et al. 1994; Barkema and Cook 1993; Batte and Johnson 1993, 308-334).

A second disadvantage for producers with smaller operations is marketing. Smaller farms are often unable to deliver directly to packers a significant volume of hogs on a regular basis. This alone may reduce the base price or premiums or increase discounts paid and, in some cases, limit market access (Sporleder et al. 1995). Lower prices may also result from an inability to provide the quality and type of hog demanded by packers. The use of improved genetics and other technologies and the availability of and ability to use information to gauge economic and market conditions are important inputs defining a producer's ability to bring a hog to market that corresponds to consumer demand (Van Arsdall and Nelson 1985).

The evolution of the structure of, and production practices used within, the pork industry results in questions regarding the role of producers with small or diversified farming operations and their local cooperators (Hogeland 1995). While various measures have been adapted as means to improve the odds for producers with small and medium sized operations (for example corporate farm legislation), structural changes in the industry have not yielded. Independent hog producers, thus, need to continue to seek out alternatives that will allow them to remain competitive. One alternative, that explored in this investigation, is engaging in cooperative marketing arrangements with other producers.

The Role of Cooperatives

Cooperatives continue to be important in agriculture. There were 3,651 agricultural cooperatives in the United States in 1998 with 3,352,557 memberships (Kraenzle et al. 1999; Kraenzle 1999). Of these, 1,347 were farm supply cooperatives (1,773,659 memberships), 441 were related service cooperatives (180,562 memberships), and 80 were livestock cooperatives (161,515 memberships). Headquartered in Illinois in 1997 were 203 cooperatives with 233,229 memberships. Of these, 3 were livestock cooperatives with 40,993 memberships.

Livestock marketing cooperatives were developed during the first half of the century to assemble and transport livestock to packers (Hogeland 1987). The first cooperatives provided value to producers by grouping livestock into saleable lots and bargaining with packers for the best price. Both functions were important; the latter especially so because producers had little or no information about current market conditions. As the industry has evolved so has the role of cooperatives. Today, benefits livestock producers may seek from marketing cooperatives also include the means to capitalize on economies of size, adopt and use technology, and gain/maintain market access (Fulton and Gillespie 1995). There is evidence that livestock producers continue to recognize value from cooperatively marketing. Gray and Kraenzle (1998) found a positive attitude among members of a North Central milk marketing cooperative. Sixty-four percent agreed (and only 16.4 percent disagreed) with the statement that farmers must stick together even if they must give up some of their individual freedoms. Seventy-five percent agreed that farmers receive benefits from cooperative business arrangements (only 4.3 percent disagreed), and 59.6 percent agreed that members of agricultural cooperatives have a competitive advantage in the market place (10.3 percent disagreed). Nearly 63 percent of respondents disagreed that individual farmers can usually make better marketing decisions alone; 12.6 percent agreed.

Marketing cooperatives do, or have the potential to, provide important benefits to members (Schrader and Boehlje 1996; Koehler, Lazarus, and Buhr 1996; Hogeland 1995). Membership can (1) improve market access and prices, and increase packer competition, (2) reduce marketing costs, (3) facilitate coordination in the marketing channel either by contractual arrangements with packers or by ensuring members have accurate and current information about the type and quality of product packers demand, (4) improve member access to information and educate producers on its use in making production and marketing decisions, and (5) provide additional services or access to resources and technology that might otherwise be unavailable to producers with smaller operations.

Cooperative marketing arrangements, however, are not without cost, and support for the cooperative concept as a means for small operations to compete in the hog industry is not universal. The costs of cooperative membership and other potential impediments to their success are discussed at great length and in great detail throughout the literature. In addition to explicit membership and marketing expenses, there are often costs associated with aligning individual production and/or marketing with performance or other demands required for membership (Koehler, Lazarus, and Buhr 1996). The traditional independent producer may be reluctant to relinquish control over decision making and to share information, necessary steps for a successful cooperative venture (Ginder 1995a; Van Arsdall and Nelson 1985). Furthermore, as in any organization, there will be personality conflicts and the need to reconcile differences in member goals and decide how these goals will be prioritized and what actions and resources will be committed to reaching them.

A final addition to the debate regarding the actual and potential value of cooperative membership is identification of the membership to be served. Most frequently discussed is how well cooperatives serve different sized operations and those producing products of varying type and quality (Gray and Kraenzle 1998; Hogeland 1995).

Developing and Implementing a Cooperative Strategy

It has been argued that the salient core competency of cooperatives is their identity with farmer members (Hogeland 1995). Defining the membership to be served and developing and refining a strategy to do so is fundamental for cooperatives to successfully compete on behalf of their constituency. This is far from easy. Pork producers have multiple goals, and the priority producers place on each varies. Alternative courses of action compete for resources and are, at times, conflicting (e.g., low marketing cost and high service level). It is for this reason that many argue that a successful cooperative venture will include a membership with a relatively uniform set of shared goals (Koehler, Lazarus, and Buhr 1996; Ginder 1995b). It will also include a program to educate members on cooperative principles and the benefits of membership (Gray and Kraenzle 1998). Arguably, to do so, a cooperative must understand the benefits in which producer members find value. The identification of such will not only help the cooperative develop and refine its strategy but will help the organization decide what services will benefit from standardization, which are of general value to the membership, and which are better suited to personalization. The first step is to understand producer goals and to identify how the cooperative does and can provide value to its members in helping them achieve these goals. The purpose of this research was to develop and empirically apply a relatively simple method by which cooperatives can identify what their members value and to define cooperative performance in providing this value.

Survey Design and Response

Attributes and perceptions of pork producers were elicited through mail survey. A survey was sent to a random stratified population of producers in Illinois. The sample was stratified into three regions (West, East, and South) in order to ensure a representative geographic coverage of the state and to explore whether farm characteristics, production efficiencies, or producer perceptions of cooperatives differed by region.¹ A total of 1,346 questionnaires were sent to producers during September of 1996 (910 to a randomly chosen sample of pork producers and 436 to members of four marketing organizations). The response rate was 29 percent (336 of 1,158 surveys sent but not returned because of incorrect or incomplete addresses or because producers had left the industry). The sample population included producers marketing their animals independently directly to one or more packers, to a buying station, or to a terminal market; producers marketing their animals through a formal marketing organization (including hog marketing cooperatives); and producers marketing their animals through an informal organization. Members were queried from organizations that have the primary function of providing value by marketing livestock from individual members jointly. Although not all such organizations were officially designated as cooperatives, all function as cooperatives and are referred to as such throughout the manuscript.²

The survey was sent to members of four hog marketing organizations to increase the number of responses from marketing cooperative members and to allow for comparison between the perceptions of members of a specific formal marketing organization and its manager. Producers marketing hogs independently (hereafter called independents) represented 66.4 percent of the total number of respondents; 33.6 percent were members of a marketing organization.

Producers responded to questions about the current and past characteristics of, and marketing practices used on, their farm and the importance of the swine enterprise to their farming operation, and they provided personal demographic information. Independents were then asked additional questions about the production and marketing performance of their hogs, the number and characteristics of the packers they market hogs to, any previous experience with hog marketing cooperatives, and their outlook for the future of their hog enterprise. Producers marketing hogs cooperatively through a formal or informal organization (hereafter called members) were asked about their previous experience with hog marketing organizations and the factors that influenced their decision to join their current hog marketing organization. Members also provided information on membership requirements, characteristics of their market hogs, their perception of the benefits and constraints associated with marketing hogs cooperatively, and factors influencing their outlook for the future of their hog enterprise. Finally, in a separate survey, cooperative managers were queried about historic membership numbers, average hog performance, membership requirements, services and other benefits that are or will be offered to producer members, the strengths of and challenges faced by the organization and how they believe producers perceive the organization's performance. While managers from only four cooperatives were surveyed, their responses proved valuable in defining details of cooperative operation about which producers may not have been fully informed (including, e.g., the number of packers bidding on hogs).

Results and Discussion

Comparison of Cooperative Members and Independents

Differences existed between cooperative members and producers marketing hogs independently including age and education level; ownership, ownership structure, and

size of operation and its contribution to farm income; marketing practices; and intent regarding the future of the hog enterprise. Independents tended to be older and less educated than cooperative members (figures 1 and 2).³ Fifteen percent of independents but only 5 percent of members were older than 60 while more members (69 percent) were between 31 and 50 years of age (versus 57.5 percent of independents). Seventy-three percent of members had some college education as compared with 63 percent of independents. However, more striking is the difference between the 50 percent of members versus 37 percent of independents who finished college. Average age of operation was not significantly different between independents (22 years) and members (20 years).

Overall, 63 percent of respondents were full owners of their operation. The remaining respondents were in a partnership (34 percent) or were employees (3.5 percent). The average number of partners for those in a partnership was 1.5. Nearly two-thirds had only one partner and most (89 percent) had only one or two partners. There was no difference in either number of partners or share owned between members and independents. Nearly all producers owned a finishing (79 percent) or farrow to finish (14 percent) operation. The only difference in type of operation between members and independents was that 5 percent of members but only 0.5 percent of independents owned a wean to finish operation ($p = .027$).

The average number of hogs marketed in 1995 by members (4,116) was significantly higher than the average number marketed by independent producers (1,980) ($p = .001$) (figure 3). Members also shipped more frequent and larger-size loads (figures 4 and 5). Over half of members shipped hogs at least once per week (versus only one quarter of independents). Only 7 percent of members (versus 43 percent of independents) shipped hogs once every three weeks or less often or irregularly. Average size load was less than 40 hogs for over two-thirds of independents (versus slightly over one-third of members).

Figure 1. Operator Age

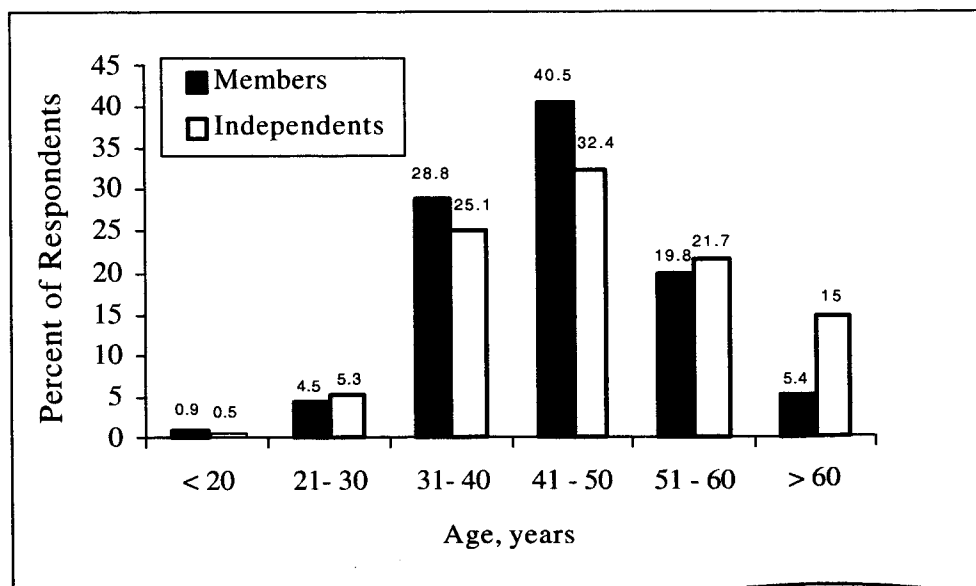


Figure 2. Education Level of Operator

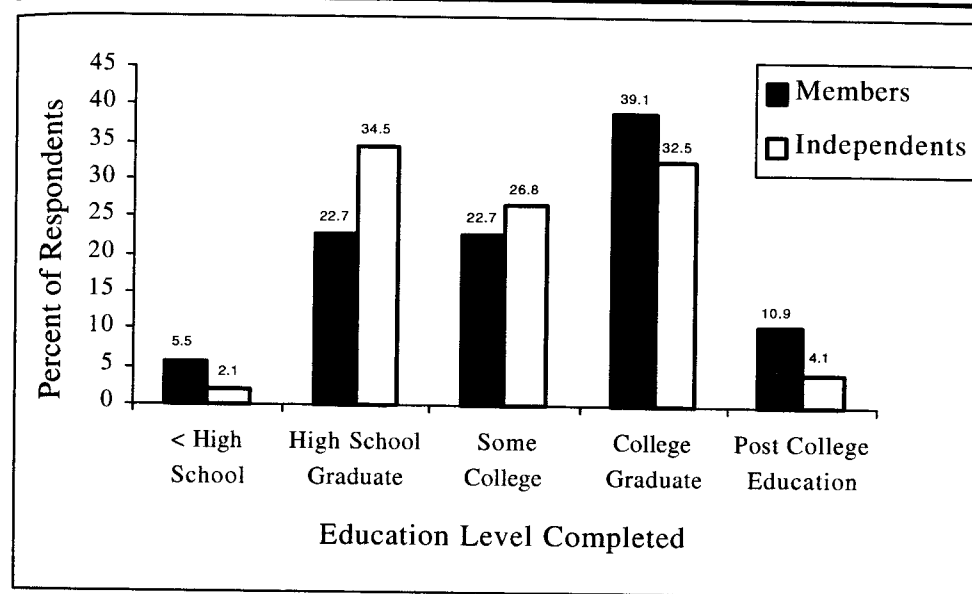


Figure 3. Distribution of Average Number of Hogs Marketed in 1995

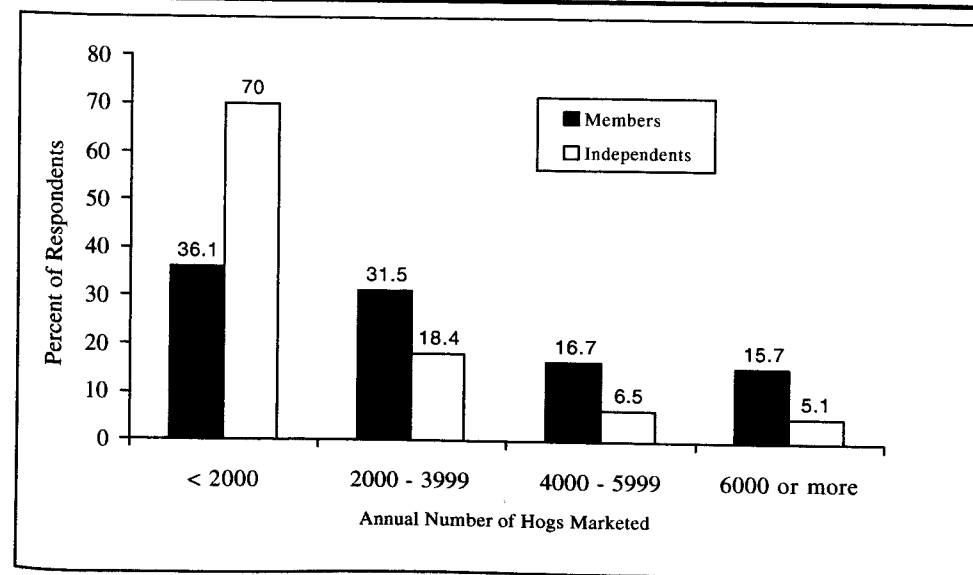


Figure 4. Frequency of Shipping

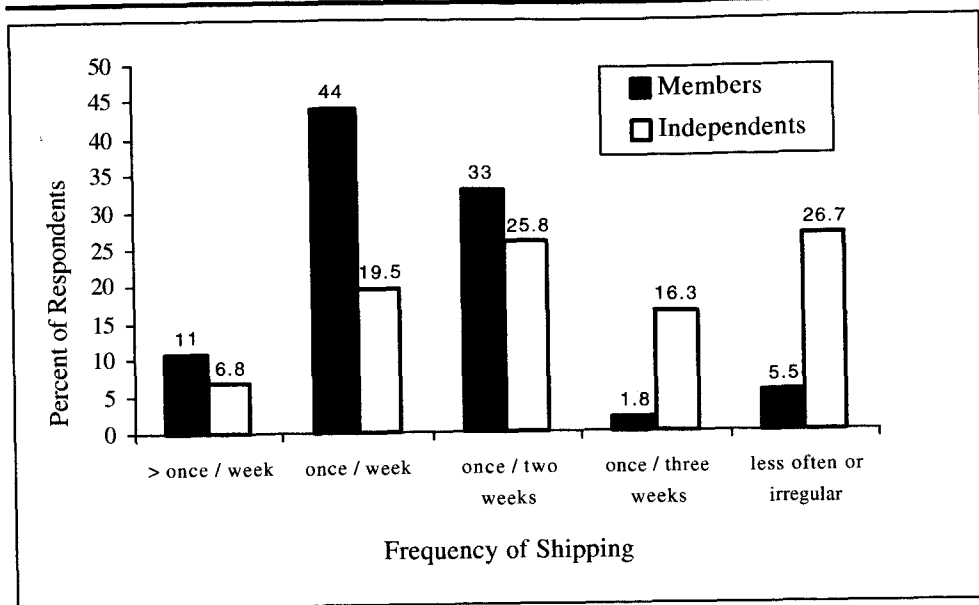
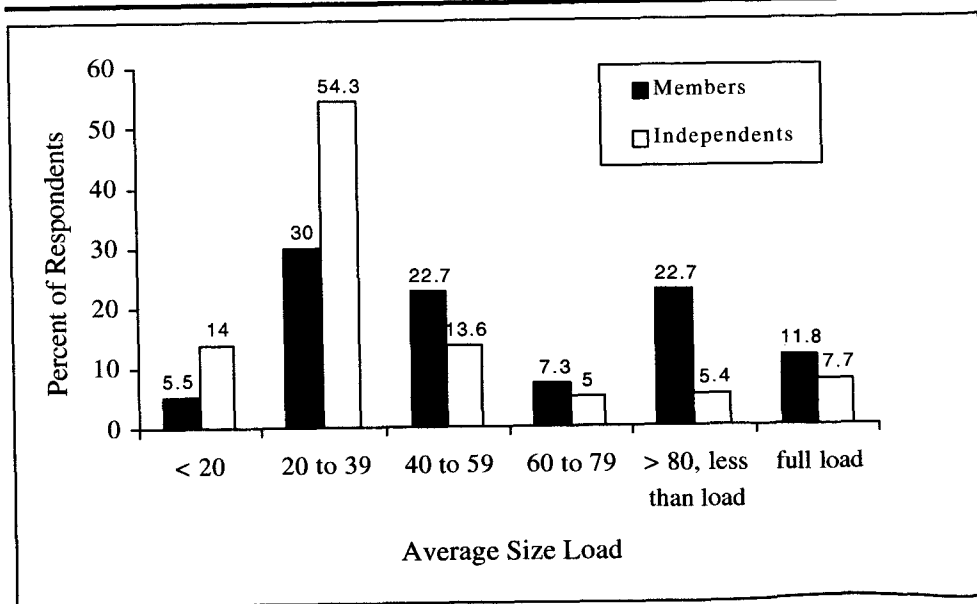


Figure 5. Average Size Load



Members were less likely to ship average loads of less than 40 and were more likely to ship larger loads. These findings concur with the assertion by Sporleder et al. (1995) and others that producers with smaller operations may be unable to deliver directly to packers a significant volume of hogs on a regular basis.

Cooperatives marketed hogs to a higher average number of packers (6.7) than independents (1.6). In fact, 58 percent of independents marketed hogs to only one packer and 88 percent to only one or two packers. Conversely, member organizations marketed to between three and eleven packers. Hogs marketed by members were leaner (51.3 versus 50 percent) ($p = .000$) and of lower backfat (0.91 versus 0.95 inches) ($p = .002$) than those marketed by independents, but there was no difference in live weight. Both groups improved the lean score and decreased the backfat of their hogs between 1995 and 1996 but there was no difference in improvement between the groups. Finally, there were no differences in reported live or carcass based premiums between independents and members, although the factors significant in explaining premium received were different for independents (number of hogs marketed, load size, and percent lean) and members (percent lean).⁴

Average percent of total farm income earned by the hog enterprise was not different in 1990 or 1991 for members or independents. Thereafter, from 1992 to 1995, members became more specialized in hog production and independents less specialized. Nearly half of members (versus only one-quarter of independents) reported an intent to increase the size of their operation during the five years following the survey. In contrast, 20 percent of independents versus 4 percent of members reported an intent to decrease the size of their operation during this same time period. The average percent decrease planned for members intending to reduce enterprise size (50 percent) was less than that planned by independents (76 percent). The average percent increase planned by members intending to increase enterprise size (72 percent) was greater than that planned by independents (57.5 percent). The differences were not significant.

Independents, but not members, were asked in an open-ended question to reveal the top one or two factors influencing their decision regarding the future size of their operation. Of those providing a response, 28 percent mentioned labor availability and cost. Labor was more often mentioned among producers who planned to increase or maintain (31 percent) the size of their operation than among those who intended to decrease the size of their operation (18 percent). Other key factors mentioned included the need to improve efficiency or income, feed cost, existing facilities or the cost of building additional facilities, operator health or age, and the price they receive for their hogs. Independents planning to *increase* the size of their operation more often mentioned the need to improve efficiency or income (39.5 versus 21 percent overall). Independents planning to *decrease* the size of their operation more often mentioned feed cost (35 versus 10.5 percent of those planning to *increase* the size of their operation), existing or the cost of new facilities (21 versus 5), operator health or age (15 versus 5), and hog price received (23.5 versus 5).

Characteristics and Attitudes of Producers Marketing Independently

Sixty-five percent of independents used buying stations to market some or all of their hogs. Nearly 42 percent marketed hogs directly to a packer and 14.5 percent used a terminal market. Slightly over half of independents sold the *majority* of their hogs through a buying station, slightly over one-third directly to a packer, and 10 percent through a terminal market. Almost 60 percent sold at least half of their hogs on carcass

merit; Of these, 53 percent sold all their hogs on carcass merit. Forty-six percent sold at least half their hogs on a live weight basis; Of these, half sold all their hogs as such.

In aided response by independents indicating they received a premium above the base price for their hogs, 81 percent indicated the origin of this premium included the weight of the carcass or live animal and 72.5 percent indicated backfat. Unaided factors specified by producers included percent lean and yield. A greater percent of those receiving a premium on animals marketed by live weight indicated weight as an origin of this premium (86) than of those receiving a premium on animals marketed by carcass merit (76) ($p = .000$). There was no difference in the percent indicating backfat as influencing premium.

Independent producers marketed to an average of 1.6 packers. Factors most important to independent producers in choice of packer were base price (mean = 2.5 where 1 = "important" and 9 = "not important"), premium/discount structure (2.9), and distance to packer (3.2). With one exception, size of operation did not influence the order of importance of the different factors used to select packers. Operations marketing more than 6,000 hogs annually considered the premium/discount structure as more important than base price and distance from packer.

Although not in a hog marketing organization, 21 percent of independents reported they were members of a cooperative or group involved in buying inputs for their hog operation. Most bought feed (87 percent), equipment (82), and disease control products (62). Fewer (38 percent) were in a group for purchasing genetics.

Only 7 percent of independents had previously been in a hog marketing cooperative. In aided response in which producers indicated all that applied, 56 percent indicated they left because they had lost too much independence, 44 percent had not agreed with the orientation of the cooperative, and one-third could not meet or did not agree with the performance objectives imposed, were not paid for the quality they produced, or believed the cost of participation outweighed the benefits.

Eight percent of independents were considering joining a marketing cooperative, organization, or group to market their hogs. Two factors were important in this choice: to receive a higher price for their hogs (mentioned by 94 percent of respondents in aided choice) and improved market access (87.5 percent). Fifty percent mentioned improved access to information, 44 percent mentioned increased interaction with other farmers, and 37.5 percent mentioned access to better genetics.

Characteristics and Attitudes of Producer Members of a Hog Marketing Organization

Nearly 92 percent of producers marketing through a marketing organization were members of a formal marketing group; 5 percent were members of an informal marketing group, and 2 percent were involved in contract production. Nearly 70 percent of members had been members of their organization for fewer than four years. In response to an aided question, producers agreed that reasons they joined were: to be paid for quality produced (80 percent), belief that participation could earn them a higher price for their hogs (75 percent), and belief that the benefits of participation outweighed the costs (68 percent). The fact that 78 percent agreed with the goals of the cooperative supports the assertion of the literature that, to be successful, a cooperative requires a membership with a relatively uniform set of goals. Slightly less than half indicated that they joined their current organization because they agreed with the way decisions were made, get along with other members of the marketing organization, can market the number of

hogs they want at a time they want, or because participation does not require much additional work.

Twelve percent of members had previously been in another hog marketing organization. The most important factor explaining why they left, not being paid for quality produced, was mentioned in aided response by half of responding producers.

An aided question queried members about requirements to join their current hog marketing organization. These included membership fees (50.5 percent of respondents) and share purchases (16), and changes in genetics used, minimum leanness criteria, and the adoption of a specific nutritional program (each 21). Other requirements included meeting specific animal health (15) or backfat (13) criteria, investment in facilities (7), and animal weight criteria (5). Twenty-two percent of respondents indicated that there were no requirements for joining and participating in their hog marketing organization.

Benefits of Participation

Respondents agreed with the literature regarding the benefits of cooperative membership. Seventy-seven percent of respondents perceived that they received a higher price for their hogs because of their participation. The average perceived benefit was \$1.96 per cwt. for members indicating price benefit on a live weight basis and \$1.67 per cwt. for those referring to price benefit on a carcass basis. There were no differences between cooperatives surveyed in the amount of perceived financial benefit due to participation in a hog marketing organization.

Benefits of participation and cooperative performance in providing these benefits were elicited by asking respondents to rank their importance and the extent to which they applied to the respondent's own cooperative on a scale from one (very important or strongly agree) to nine (unimportant or strongly disagree) (figure 6). Receiving a higher price was the most important benefit mentioned by producer members (mean = 1.8). Following were improved access to information (2.4), to adopt better genetics (2.75), the ability to improve production efficiency (2.9), interaction with other producers (3.0), and improved access to adopt technology (3.3). Less important were the opportunity to sell animals on a preferred date (3.8) and to increase the specialization of the farm in hog production (4.2). The level of agreement with the statement that their cooperative provides these benefits followed a similar pattern. In fact, the correlation between the level of agreement from members that their cooperative provided the benefit and the level of importance the member placed on this benefit was significant for all benefits ($p = .000$) (table 1). Producers strongly agreed that their cooperative improved their ability to receive a higher price (mean = 2.7) and access to information (2.8), the two benefits cited as most important. Producers more strongly agreed that cooperative membership increased their interaction with other producers (3.0) than their ability to adopt new genetics (3.7). And, although it was considered important by respondents, they were less likely to agree that membership improved the production efficiency of their herd (level of importance = 2.9; level of agreement = 4.0). Respondents were also not in strong agreement that their cooperative allowed them to market on a preferred date (3.85) or that membership allowed them to increase the specialization of their farm (4.5), nor were either considered very important.

The most important perceived constraints of cooperative membership included not being paid for quality produced (mean = 3.1) and decisions made by the organization that are not in the producer's best interest (3.7) (figure 7). The latter supports the literature that asserts membership constraints include loss of decision making control and the need to reconcile differences in goals of individual producers. The only statement

Figure 6. Average Level of Agreement and Importance of the Benefits of Participating in a Hog Marketing Cooperative

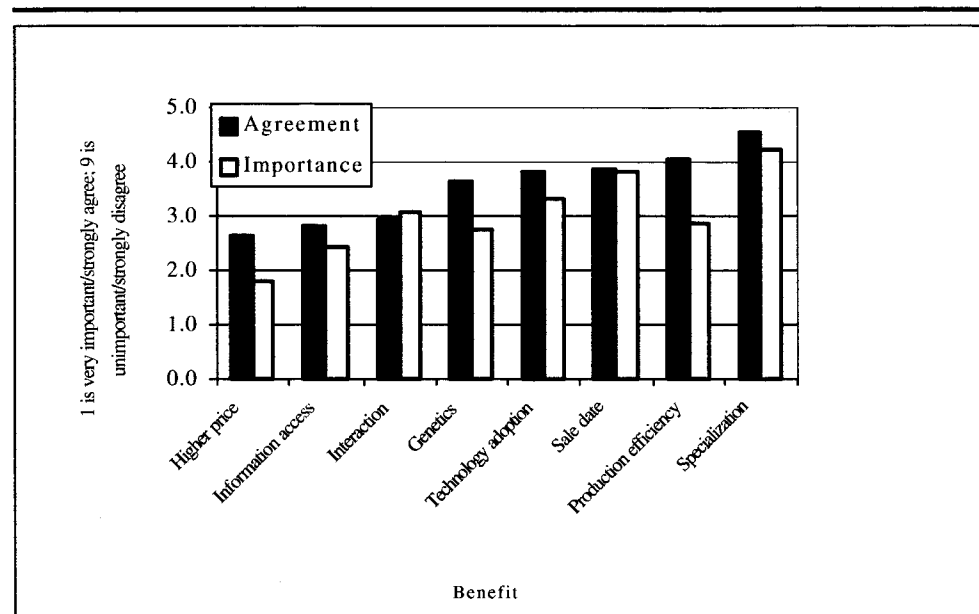


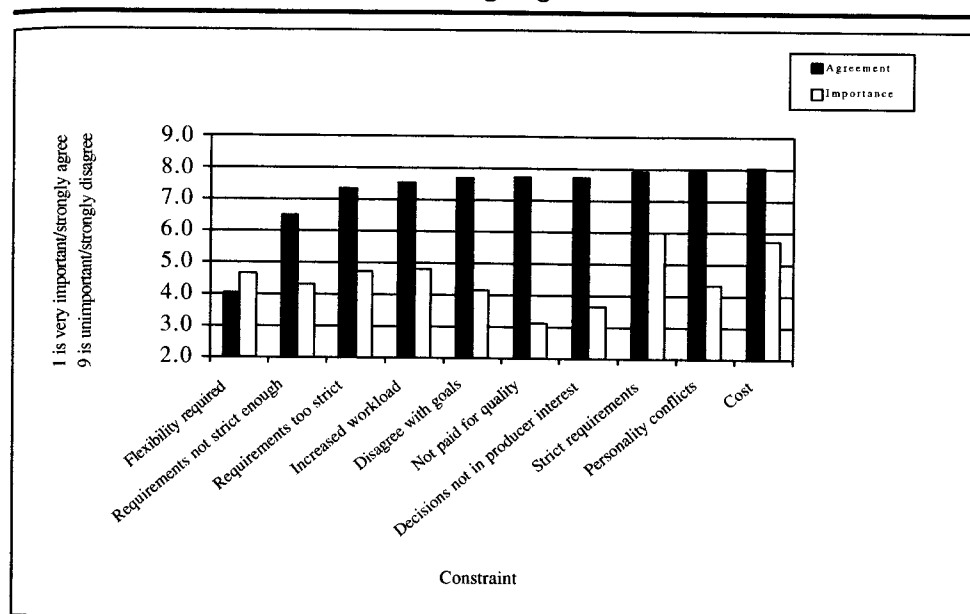
Table 1. Correlation Between Level of Agreement and Level of Importance Assigned to Cooperative Benefits

| Benefit of Cooperative Membership | Importance - Mean Rating | Agreement - Mean Rating | Significance - difference between means | Correlation Coefficient | Significance |
|---|--------------------------|-------------------------|---|-------------------------|--------------|
| Adopt new technologies | 3.32 | 3.84 | .012 | .714 | .000 |
| Adopt new genetics | 2.78 | 3.68 | .000 | .799 | .000 |
| Access to information | 2.44 | 2.79 | .002 | .799 | .000 |
| Receive higher price | 1.79 | 2.70 | .000 | .596 | .000 |
| Sell animals on preferred date | 3.78 | 3.90 | .608 | .688 | .000 |
| Increase specialization | 4.24 | 4.56 | .214 | .688 | .000 |
| Improve production efficiency | 2.86 | 4.04 | .000 | .615 | .000 |
| Increase interaction with other farmers | 3.04 | 2.96 | .605 | .793 | .000 |

Note: Level of agreement ranged from 1 (strongly agree) to 9 (strongly disagree); level of importance ranged from 1 (very important) to 9 (unimportant).

for which there was agreement that this constraint characterizes the producer's own membership was that membership required the producer to be more flexible (4.05). In the literature, this constraint is described as necessitating the aligning of individual

Figure 7. Average Level of Agreement and Importance of Constraints Associated with Participation in a Marketing Organization



production and marketing practices with the group; a requirement involving a real cost to the member. For most constraints mentioned in the literature such as financial costs and the need to share information, producers either disagreed or strongly disagreed that the statement characterized their cooperative.

Level of agreement with statements describing benefits of cooperative membership and level of importance assigned to these benefits differed between producers with different size operations. Whenever statistically different, producers marketing fewer than 2,000 hogs annually had a lower level of agreement with the benefits of cooperative membership and assigned the benefit a lower level of importance than did producers with larger operations (table 2). This is a surprising result because evidence from the literature suggests that benefits provided by participation in a cooperative are those most important to producers with limited market access and/or limited resources. Producers marketing fewer than 2,000 hogs annually had a lower level of agreement that, because of participation in their hog marketing cooperative, they have been able to: adopt new technologies, obtain improved access to information, increase specialization, improve production efficiency, and increase interactions with other farmers. Producers with these smaller operations also considered these benefits of cooperative membership to be less important than did producers in one or more other size categories, with one exception. Producers marketing fewer than 2,000 hogs (and those marketing between 2,000 and 3,999 hogs) annually strongly agreed that participation in their hog marketing organization allowed them to receive a higher price for their hogs and considered this to be the most important benefit overall. Producers marketing between 4,000 and 5,999 hogs annually considered important the impact of the cooperative in enabling them to adopt

Table 2. Level of Agreement and Level of Importance Assigned to Cooperative Benefits by Annual Marketing

| Benefit of Cooperative Membership/Size | Level of Agreement | | | | Level of Importance | | | |
|---|--------------------|--------------|--------------|-------|---------------------|--------------|--------------|-------|
| | <2000 | 2000 to 3999 | 4000 to 5999 | >5999 | <2000 | 2000 to 3999 | 4000 to 5999 | >5999 |
| Adopt new technologies | 4.76 | 3.88 | 3.00 | 2.5 | 4.44 | 3.22 | 1.80 | 2.50 |
| Adopt new genetics | 4.25 | 2.11 | 2.64 | 2.64 | 3.27 | 1.88 | 2.30 | 2.64 |
| Access to information | 3.97 | 3.26 | 2.80 | 3.73 | 3.58 | 2.00 | 2.20 | 3.73 |
| Receive higher price | 2.68 | 2.75 | 2.43 | 3.00 | 1.86 | 1.67 | 2.09 | 3.00 |
| Sell animals on preferred date | 4.44 | 3.71 | 3.17 | 3.58 | 4.58 | 3.40 | 3.67 | 3.58 |
| Increase specialization | 5.56 | 4.00 | 3.56 | 3.50 | 5.48 | 3.79 | 2.38 | 3.50 |
| Improve production efficiency | 4.81 | 3.78 | 3.25 | 3.40 | 3.64 | 2.48 | 2.40 | 3.40 |
| Increase interaction with other farmers | 3.85 | 2.63 | 2.15 | 2.69 | 4.00 | 2.91 | 2.58 | 2.69 |

Note: Level of agreement ranged from 1 (strongly agree) to 9 (strongly disagree); level of importance ranged from 1 (very important) to 9 (unimportant).

new technologies and to increase specialization and production efficiency as numerically, but not statistically, more important than producers with fewer or more hogs. These benefits were perceived to be the least important among producers marketing less than 2,000 hogs annually.

For producers marketing at least 4,000 hogs annually, there was no significant difference between the level of agreement and the level of importance attached to each benefit, suggesting that cooperatives are addressing the factors important to their membership. There were two exceptions. For producers marketing between 4,000 and 5,999 hogs annually, the importance of the cooperative's role in making it possible to adopt new technologies (1.8) was stronger than their level of agreement that this is a benefit of membership (3.0) ($p = .040$). The importance of receiving a higher price was greater than the level of agreement that this is a benefit of membership for producers marketing more than 6,000 hogs annually as well as for those marketing fewer than 4,000.

The level of agreement among producers marketing between 2,000 and 3,999 hogs that benefits of membership including improving their ability to adopt new genetics, improving production efficiency, and receiving a higher price are important was higher than their level of agreement that their cooperative was providing these benefits. This was also true for these benefits and that of access to information among producers marketing fewer than 2,000 hogs.

Difference in perceptions of producers with different sized operations was less evident for constraints imposed by cooperative membership, about which most producers disagreed. In general, the smaller the operation, the more likely were producers to agree that membership required flexibility and to disagree with the goals of their marketing organization.

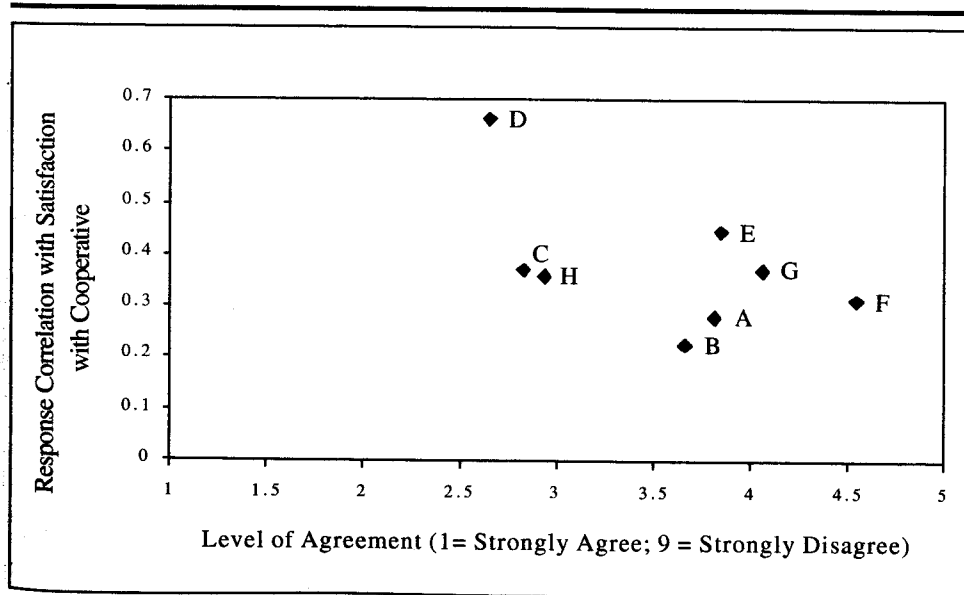
Satisfaction with the Organization

Our results concur with the findings of Gray and Kraenzle (1998) who found members of a North Central milk marketing cooperative to be satisfied. The average level of satisfaction hog marketing cooperative members held with their current marketing orga-

nization was 2.4 on a scale from one to nine with one being the most satisfied. Fifty-two percent of respondents reported an increased level of satisfaction with their organization since they joined; 40 percent were equally satisfied and 8 percent were less satisfied. Given producers' strong level of satisfaction with their cooperative, it is not surprising that most respondents (96 percent) indicated they were very likely or likely to stay in their current organization. Twenty-seven percent of producers believed that their participation had influenced them to change the size of their operation.

Perceptual maps were developed to visually depict members' perceptions of the benefits and constraints associated with membership in their cooperatives as well as the strength of the relationship of these perceptions to the respondent's overall satisfaction with the cooperative (figures 8 and 9). The vertical axis depicts the correlation between the perceived benefit or constraint and producer's overall satisfaction with the cooperative. A stronger correlation suggests that a factor has a greater influence on members' overall level of satisfaction with the cooperative; these are the important benefits and constraints in producer satisfaction. The horizontal axis indicates level of agreement with the associated statement in the survey. Agreement with benefits is considered to reflect a positive opinion; disagreement with constraints is positive.

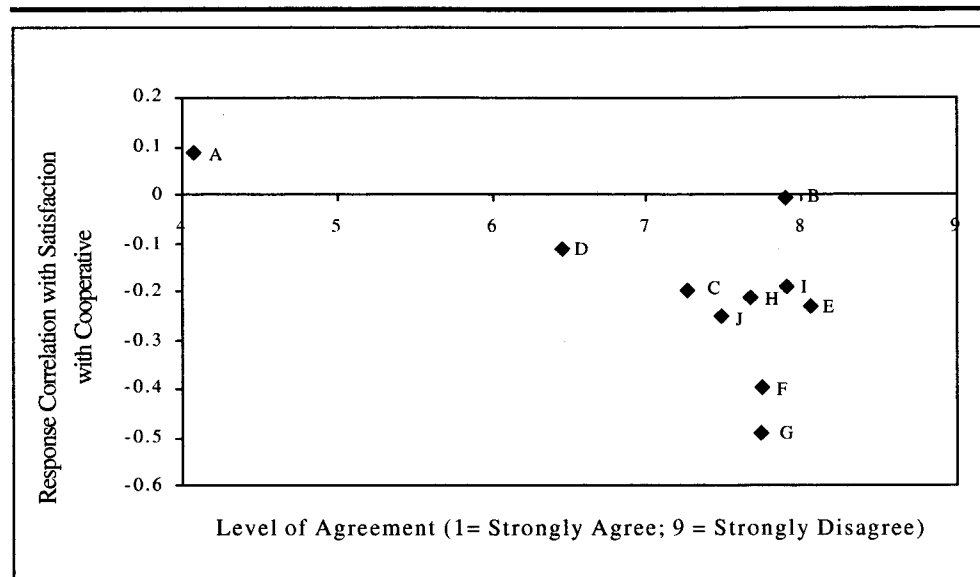
The benefit most strongly correlated with a producer's level of satisfaction was receiving a higher price for their hogs (correlation = .661 as measured by Pearson's R),

Figure 8. Perceptual Map—Producer Satisfaction and Level of Agreement that Cooperative Provides Benefit

Note: Level of agreement ranged from 1 (strongly agree) to 9 (strongly disagree).

- | | |
|---------------------------|--|
| A. Adopt new technologies | E. Sell animals on preferred date |
| B. Adopt new genetics | F. Increase specialization |
| C. Access to information | G. Improve production efficiency |
| D. Receive higher price | H. Increase interaction with other farmers |

Figure 9. Perceptual Map—Producer Satisfaction and Level of Agreement that Cooperative Imposes Constraint



Note: Level of agreement ranged from 1 (strongly agree) to 9 (strongly disagree).

- | | |
|--|---|
| A. Need to be more flexible | F. Not paid for quality produced |
| B. Requirements too strict to leave | G. Decisions not in producer's best interest |
| C. Quantity/quality requirements too strict | H. Disagree with organization goals |
| D. Quantity/quality requirements not strict enough | I. Do not get along with others in organization |
| E. Cost too high | J. Involves additional work |

that factor that respondents most strongly agreed to be a benefit of cooperative membership. Another market related benefit, the ability to sell on the producers' preferred date, was moderately correlated with overall satisfaction (.444) but producers had a lower level of agreement that this was a benefit provided by membership. The benefits of improved production efficiency (.375), improved access to information (.372), and increased interaction with other producers (.357) were also moderately correlated with producers' overall level of satisfaction. However, producers more strongly agreed that membership improved access to information and interaction than improved production efficiency. Finally, the ability to make specific operational changes as a result of membership such as increased specialization (.315) and adopting new technology (.280) and genetics (.227) were weakly correlated with producer satisfaction. These are likely benefits producers do not expect and perhaps do not desire from membership in their marketing cooperative. It is important for cooperative management to know whether producers would place value on these if facilitated by the cooperative in the future.

Correlation between individual constraints and producer's overall satisfaction level with their cooperative was, in general, very low with two exceptions. Producers' level of agreement that decisions made by cooperative management were not in the best interest of producers (.495) and that they were not paid for the quality they produce (.406) were moderately and negatively correlated with their level of satisfaction. Producers who

agreed that these were indeed constraints associated with their cooperative were less satisfied. Low correlations between satisfaction and producers' perception of whether the stated were constraints of membership, ranging from +.079 to -.250, are likely the result of little variability among producers in their perception of cooperative performance; most strongly disagreed that membership imposed those constraints.

Perceived Financial Benefits from Membership

The financial benefit associated with participation in a hog marketing cooperative perceived by members was compared with the cost. Producers were asked, "Do you think you receive more for your hogs now than before you joined your current marketing group or organization? Specify how much more or less per cwt. live or carcass."⁵ Financial cost of participation provided by managers of each marketing organization consisted of annual, marketing, and service, and any other fees. Other financial costs, such as the cost of implementing a required genetic or nutritional program or of adopting required technologies, were not considered because they were difficult to quantify and would vary greatly from one operation to another. An initial membership fee, when required, was also not considered in the calculation of financial cost because it was negligible when considered over the volume of hogs marketed over a number of years. This does not mean that it may not be a deterrent to membership, particularly for producers who are unsure of their long term participation in the organization.

Producers from one of the four cooperatives were excluded from the analysis because membership cost information was not provided by the manager. Perceived net financial benefit per cwt. live weight averaged \$1.16, \$1.44, and \$0.45 for the three remaining cooperatives. These values were not significantly different. Unexpectedly, the cooperative with the highest arithmetic net financial benefit (Cooperative Two) was also that with which its producer members were least satisfied. The mean satisfaction level for members of Cooperative Two was 3.9 on a scale from 1, very satisfied, to 9, not satisfied at all; the mean considering all four marketing organizations was 2.5. However, members of Cooperative Two had a very strong level of agreement with the statement, "I have been able to receive a higher price for my hogs" (1.2 on a scale from 1, strongly agree, to 9, strongly disagree). The level of agreement was stronger than for each of the other three marketing organizations (average for all four marketing organizations was 1.7 and was 1.8 for all producers marketing through a formal or informal organization). Producers in Cooperative Two were also more likely than others to disagree that their cooperative resulted in sacrificing individual benefits for the good of the group. Specifically, members of Cooperative Two disagreed more strongly with the statements, "I have to be more flexible because of the other members of my marketing group or organization" (4.2 versus 3.95 for members of all four cooperatives) and "the decisions made by the organization are not in my interest" (4.2 versus 3.6).

Conclusions and Recommendations

To survive, a cooperative must provide value to members. The challenges facing cooperatives have evolved from obtaining advantages within a marketing channel (e.g., between producers and packers or input suppliers) to include consideration of competition within the industry. Today, market and production benchmarks in the pork industry are set by large and often integrated farms. The role of cooperatives has necessarily also evolved. Hog marketing cooperatives initially considered their function to be simply helping producers assemble a larger volume of hogs and, as such, improving price and

market access. However, cooperatives are also the most likely mechanism to help producers with small and medium sized operations compete, not only within the marketing channel, but also within the sector (i.e., with producers with large and/or integrated operations).

Results of this research generally support membership in a hog marketing cooperative, although the nature and extent of the value of such varies and is dependent on the method by which it is evaluated. While the value of the premium received for animals sold by live weight or carcass merit did not differ between members and independents, factors significant when regressed against premium received differed between the two groups. As expected, carcass quality as defined by leanness was significant for each. However, for independents, but not members, size of operation (as represented by number of hogs marketed annually) and a dummy variable for load size (more than a full load marketed at once) were also important. Thus cooperative membership may decrease the necessity of increasing operation size to remain competitive in the marketplace.

Perceived financial benefit associated with membership in a hog marketing cooperative was positive. Also supporting the value of cooperative membership was evidence that cooperatives are providing the services members believe to be important and that members do not perceive there to be any important constraints associated with membership. Furthermore, the fact that, overall, independent producers have decreased, whereas members have increased, the size of their operations may suggest that the services and support of cooperatives designed to help producers obtain a higher price for their product or in some other way improve their ability to compete are at least in part successful.

Regardless of the positive performance of cooperatives perceived by members, there remain gaps between producer expectations and the performance/focus of their cooperative. Two-way communication between cooperative management and membership is important. It is clear that the responsibility of ensuring producers understand the purpose of cooperative actions and the value of such lies on the shoulders of cooperative management. They must, therefore, know the goals and expectations of producer members and how they are served by the actions of the cooperative.

Recommendations

Further research to facilitate such is recommended. Current information should be gathered that allows for the identification of individual and operational characteristics and goals of producers that would benefit from cooperative membership. The lack of agreement on the value of cooperatives to producers is likely not because cooperatives do not provide value but rather because membership does not provide the same value for all producers and likely does not provide any value for some. By design and intent, cooperatives are working to serve a single membership, a membership with a wide array of differing and, at times, conflicting goals.

A second important research need is the development of a framework in which to quantify the actual (versus perceived) financial benefit of cooperative membership. The first step should be a comparison of base prices received by producers marketing hogs independently with those received by producers marketing hogs of like characteristics collectively in order to identify any influence of market power or other factor in gaining cooperative members a higher price. The next step is to quantify the financial benefits of cooperative membership, because members can and do more cost effectively produce the product demanded by the marketplace for which they are most well suited. A time series approach is likely the appropriate format for such a line of inquiry, identifying

and quantifying the value of strategic and tactic decisions made over time by producers as influenced by their membership.

Notes

1. The regions, West, East and South, were selected based on the recommendation of Illinois Pork Producers Association. The West region is relatively more concentrated in hog production, the East region in grain production, and the South region is mixed. Characteristics of operations and hog production efficiency differed by region. The empirical application of this model may not well represent the performance of U.S. hog marketing cooperatives in general because the population of producers surveyed was limited to Illinois. The growth of the hog industry in states not considered to have a traditionally defined comparative advantage in hog production is clear evidence that there are differences between states; differences that likely extend to the goals and objectives of producers.
 2. Cooperatives and like formal or informal organizations are differentiated from networks. Networking arrangements usually include shared resources and decision making regarding the production process. For example, a network may involve a seedstock farm that supplies sows to several gestation and farrowing operations. Young pigs are then fed to market weight on the farms of other producers in the network. Networks are more complex than the marketing organizations discussed here. In networks, hogs must be priced internally rather than by the market because they are transferred from one producer or operation within the network to another. It may, therefore, be more difficult to allocate earnings in accordance with resource contribution.
 3. For comparison of differences between means, the categorical responses of producer age and education level, frequency of shipping, and size of load were treated as continuous variables.
 4. Although an independent sample t-test revealed that the difference in premium received between members and independents was not significant, regression analysis demonstrated that the specific influences on premium differed between groups. For independents, the number of hogs marketed, load size (at least a full load and otherwise), and average animal leanness were significant in explaining variability in premium. The premium increased with number of hogs marketed, but the effect was very small; each additional 1,000 hogs increased premium per cwt. by only \$0.20. Each percent increase in leanness increased premium received by \$0.15 per cwt. carcass. For members, as with independents, carcass premium was a positive function of percent lean. When members and independents were considered as a group, the explanatory power of the model dropped considerably, and premium was only a function of leanness.
- For both members and the combined population, other factors that were expected to, but did not, have a significant impact on premium received included size of load and frequency of shipping, number of packers, weight, and sales channel(s) used. Lack of significance may be due to the small pool of respondents who responded to each query. However, it is equally likely the result of a flawed attempt to measure direct price benefit from cooperative marketing. Actual premium structures offered by hog packers (i.e., the "reward" received by a hog or carcass with particular characteristics) rarely vary for different producers selling to the same packer. Rather, it is the base price that would change because of marketing characteristics of selling agents (e.g., market power, ability to offer a consistent and uniform volume of hogs). Alternatively, hogs of one group (e.g., members) may receive a higher premium simply because they have characteristics more valuable to packers (e.g., percent lean is significant in explaining premium for both groups) or members may market to packers who use a more aggressive premium structure. If the latter is the case, the higher premium is likely offset by a lower base price.
5. It is instructive to note that, while here a quantitative value was elicited, the literature asserts that qualitative benefits of membership may in fact outweigh financial benefits (Poray and Ginder 1997). And, in fact, there are at least two other limitations inherent in representing the value of financial benefit from cooperative membership as that perceived by members. First is the likelihood that improvement in price perceived by producers is not that realized. While member perception is the important measure by which cooperatives can gauge member satisfaction and the likelihood

members will remain in the organization, its use limits the value of the results for producers searching for the true value of cooperative membership. Second, the use of member perceptions does not allow one to draw conclusions about the source of financial or other gain. Arguments in the literature support two sources of direct financial gain: market power from collective marketing and improved alignment between member hogs and the type and quality demanded by the market.

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