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United States
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Rural Development

Rural Business-Cooperative Programs

Research Report 229

A man in a grey t-shirt and blue jeans is focused on working with a complex piece of machinery. The machine is filled with numerous black and yellow cables, some of which are bundled together. The man is leaning forward, his hands are on the machine, and he appears to be adjusting or connecting something. The background is slightly blurred, showing what looks like a workshop or a factory setting with shelves and other equipment.

Member Satisfaction With Their Cooperatives: Insights From Dairy Farmers

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ABSTRACT

The key to being a successful cooperative is performing functions and providing services to members' satisfaction. Correlations between factors related to members' satisfaction with their cooperatives were calculated using data from four dairy

cooperative membership surveys. Corporate-level issues concerning how well the cooperative is run and items affecting members' pay prices are strong forces in member satisfaction.

Keywords Member satisfaction, dairy, cooperatives, correlation, surveys, governance, management.

Member Satisfaction With Their Cooperatives: Insights From Dairy Farmers

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HIGHLIGHTS

Dairy cooperatives are member-owned organizations through which members conduct the business of marketing their milk. The key to operating a successful cooperative is for it to perform functions and provide services needed and desired by the member-owners to their satisfaction.

USDA's Cooperative Programs has assisted several major dairy cooperatives in conducting a number of membership surveys over two decades. These surveys collected information directly from dairy farmers about how producer-members think and feel about their cooperative. These opinions were analyzed to determine what factors are related to member satisfaction with their cooperative.

A variety of surveys conducted over many years and across the Nation reveal that dairy farmers continue to look to their cooperatives for an assured market, or, put another way: for the guarantee of a market and payment for their milk.

Correlations between each of the variables (the survey items the producers were asked about) were calculated. These correlation coefficients reveal whether or not there is a linear relationship between member sentiment on the various items and the strength and direction of the relationship.

Member satisfaction with their cooperative overall was very strongly correlated with:

- Satisfaction with the cooperative's management;
- Satisfaction with the cooperative's milk pricing policies.

Member satisfaction was strongly correlated with their:

- Opinion that the cooperative was doing a good job of marketing members' milk and returning the best price for their milk;
- Satisfaction with the cooperative's management of operating and marketing costs;
- Satisfaction with the cooperative's board of direc-

tors.

Communication and member influence were also strongly related to member satisfaction, as evidenced by the strong correlation between members' satisfaction with their cooperative overall and their:

- Agreement the cooperative keeps them well informed about its operations;
- Agreement they have a great amount of influence on how the cooperative is run;
- Satisfaction with the amount of influence members have on how the cooperative is run.

Many additional items showed moderate correlation with overall satisfaction with the cooperative. These concern member connection to the cooperative, viewing the cooperative as a unique organization, and satisfaction with various services the cooperative provides, as well as agreeing with certain cooperative principles. A higher overall satisfaction level with the cooperative was moderately associated with greater disagreement that "the cooperative was more concerned about operations than its members."

The issues affecting members' bottom lines appear to be the strongest forces in member satisfaction. Feeling informed about the cooperative may contribute to members' feeling satisfied in these areas.

The first priority to cultivate member satisfaction with their cooperative appears to be a competent board of directors and a capable management team that do the best job of marketing member milk, minimizing operating costs, and setting satisfactory milk pricing policies in place. A second area for member satisfaction is sound communications to keep members well-informed of cooperative operations and to provide feedback from members regarding their wishes and concerns.

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Introduction

The key to being a successful cooperative is to perform functions and provide services needed and desired by its members to their satisfaction.

In the dairy industry, cooperatives are member-owned organizations, through which members conduct the business of marketing their milk. Controlled, financed, and used by members, these organizations benefit members by enhancing returns to their milk production efforts. To support the primary marketing function, cooperatives may further process member milk, offer additional services to their member producers, and represent producers' interests in the marketplace and in policymaking. As organizations of producers, dairy cooperatives have the advantages of working closely with members for assembling milk, providing field services, and performing farm-related functions as well as or better than other milk handlers.

To efficiently perform their roles, dairy cooperatives have adopted various organizational structures. In many cases, this has meant handling large amounts of producer milk, operating over a wide geographic area (multistate, regional, or national in scope) and carrying on manufacturing and processing plant operations, resulting (in some cases) in fairly bureaucratic, complex business organizations that require high levels of management expertise.

This complexity may lead to a lower level of direct participation and grassroots involvement by the members, or it may cause some members to feel less connected to their cooperative. This underscores the value of understanding members' views about their cooperatives and how satisfied they are with the cooperative in order to better serve them.

There were two major studies into dairy farmer evaluations of their milk buyers (cooperatives as well as proprietary handlers or "non-cooperatives")

in the 1980s. A March 1981 survey collected the opinions of 1,612 dairy farmers who produced Grade A milk across the United States (Boynnton, et al.). Sixty percent of the farmers were cooperative members. Responding farmers gave favorable ratings to their milk buyers in all six aspects examined:

1. Guarantee market and payment for milk;
2. Assure accurate weights and tests;
3. Increase milk price;
4. Reduce marketing costs;
5. Provide field services, and
6. Provide a voice to farmers in marketing decisions.

Other highlights from the study included:

- Cooperatives were rated as good as or better than proprietary handlers on 17 of 19 statements related to the areas mentioned above.
- Only on the price paid for milk and the flexibility to improve income by shifting to another buyer did farmers indicate cooperatives were outperformed by proprietary handlers.
- Farmers felt that cooperatives were most often the leader in establishing price level in the market.
- Farmer characteristics, size of milk buyer, and whether their cooperative operated a plant had little effect on farmers' evaluation of their buyer.

Most of these findings were echoed in a February 1989 survey in 12 Southern States that collected the opinions of 2,538 dairy farmers (Liebrand, et al.). Eighty-two percent of the respondents were cooperative members. Insights gained in this study were:

- The prices farmers receive may be one of the most significant factors affecting satisfaction

level with their milk buyers—cooperative or otherwise.

- Some tradeoffs appeared between price and deductions versus service and market and payment assurance. Farmers most frequently chose to market through cooperatives to get an assured market and payment, higher prices, and better services. In contrast, those who sold to proprietary handlers most frequently chose their buyer to gain higher prices and/or because of friendly personnel.
- As the size of the dairy farm increased, the portion of farmers rating the cooperative excellent in providing an assured market, checking weights and tests, providing market information, and providing policymaking also increased. However, the percentages of the largest herd-size group that rated the cooperative "excellent" in milk hauling and field services were lower than other, smaller herd-size groups.
- In general, a larger portion of farmers agreed that cooperatives should process or manufacture more member milk than those who agreed that member investment should be increased to process more milk.
- A higher proportion of bargaining/operating cooperative members participated in various cooperative activities than did members of bargaining-only cooperatives. (Bargaining/operating cooperatives operate dairy plants while bargaining-only cooperatives do not.)

The findings from these two studies yielded valuable information about the functions and services that dairy farmers want their cooperatives to perform in marketing their milk. However, this information represents only the general assessments of the milk buyers by the survey respondents. For a cooperative to take concrete steps to satisfy its members, direct input from members is necessary.

During the past two decades, USDA's Cooperative Programs has provided technical assistance to several major dairy cooperatives in conducting five membership surveys to find out directly from their members what they think about their cooperatives. The surveys included questions about the cooperatives' internal management and operational issues, as well as some of the points highlighted by the two

studies cited above. Specific reports were presented to the respective requesting cooperatives upon completion.

The data collected in conducting these technical assistance projects constitute a unique and valuable database of cooperative membership opinions. This report pools the data of four of these surveys for further analysis (data from the fifth, and earliest, survey was irretrievable). This research has the premise that members' satisfaction with the cooperative is of vital importance to the cooperative and—through the use of the survey database—it identifies factors that are associated with, or contribute to, members' satisfaction.

Data

The membership surveys were conducted independently in January through March in various years between 1993 and 2012. The four surveys combined had 2,379 mailed-in responses. Individually, a majority of each cooperative's members sent in their questionnaires, ranging from 53 to 60 percent of the cooperatives' members. There were 43 questions that were the same, or similar, between the different surveys; most were relevant to the topic of member satisfaction.

Some respondents did not answer all the questions, as is typical with most surveys. So a subset of the data where each respondent had answered all of the 43 selected questions (1,736 dairy farmers) was used for this study (table 1). These 1,736 respondents represent nearly three-fourths of all the respondents and between 37 and 43 percent of each cooperative's entire membership. (One survey did not ask 2 of the 43 questions; so for this survey, respondents who answered each of the 41 remaining questions in common were included.)

In addition to soliciting members' overall levels of satisfaction with their cooperatives, questions that were asked on all the surveys fell into 6 general topic areas:

- Milk pricing;
- Cooperative services;
- Cooperative operations;
- Cooperative principles;
- Cooperative governance, and

Table 1 Survey data statistics

	Number of respondents	All questions in common answered ¹
	-----Number-----	
Survey #1	1,156	921
Survey #2	518	354
Survey #3	408	271
Survey #4	297	190
Total	2,379	1,736

¹Forty-three questions, except for Survey #1 where two of these questions were not included in the survey.

- Member connection with their cooperative. The 43 questions are reproduced in appendix table 1.1; notations are made where the wording was slightly different between surveys.

The respondents were asked to indicate their level of agreement with various statements with a code number (ranging from 1 to 5) representing the strength and direction of their opinions. The range attempts to reveal the respondent’s intensity of feeling about a given item. The rating scales used in each of the surveys are shown in appendix table 1.2. For two of the items, some of the surveys asked for a rating rather than satisfaction level.

The 1,736 member opinions are examined as a single data set to preserve the anonymity of the individual cooperatives, despite each survey contributing a different number of observations.

Several caveats should be kept in mind when interpreting the results. The pooled data represent the opinions offered by members who took the time to respond to their cooperative’s survey. Further, these respondents were members of specific cooperatives that polled member opinion in this manner. Thus, it can’t be known how representative the findings are of all members of all dairy cooperatives. In addition, over the two decades in which the various surveys were conducted, dairy economic conditions have varied substantially. So, the economic or marketing climate, as well as the financial performance of the cooperatives, was most likely different for each set of survey respondents. How, or if, these items may have swayed member opinions is not known.

Methodology

This study explores the correlations between members’ levels of overall satisfaction with the cooperative and the variables that represent members’ opinions of the functions and services performed by the cooperative. Also if groups of these variables are found to closely correlate between themselves within the respective groups, they are clustered

into theme categories to allow for focused management attention.

Correlation analysis reveals the degree of association between two random variables. The correlation coefficient is a measure of the strength of this linear relationship. Correlation coefficients range between -1 and 1 and will equal -1 or 1 if the variables are perfectly linearly related. However, if there is a non-linear relationship between two variables, the correlation coefficient cannot properly reflect the association (Freeman, et al.).

In analyzing the data in this study, the correlation coefficients reveal whether or not there is a relationship between member sentiment on the various items and the direction of the relationship. For example, higher levels of satisfaction in one area may be related to higher levels of satisfaction in another area. Or, if the correlation coefficient is negative, it indicates an inverse relationship where higher levels of satisfaction may be related to lower levels of agreement with a particular principle or practice.

The membership survey data can be thought of as “ranked,” because five possible values were used to represent their feeling about, or rating of, a particular item. For example, many questions asked if the respondent’s feeling toward a particular statement was: “strongly disagree,” “disagree,” “unsure,” “agree,” or “strongly agree.” In this manner, the responses are essentially a ranking from the least positive (“strongly disagree”), to the middle response (“unsure”), to the most positive (“strongly agree”). However, while the responses are ranked in an order, a “value” cannot be assigned to the differ-

ences between the rankings. For example, it cannot be said that “strongly agree” is 25 percent more positive than “agree,” or five times as strong as “strongly disagree,” and so forth (Kitchens).

For social science studies, variables are considered to be correlated when their correlation coefficient is 0.3 or greater (Freedman, et al., page 126). For this study, a correlation coefficient of 0.5 and greater is considered a strong relationship, and a correlation coefficient of 0.7 and greater indicates a very strong relationship. Likewise, a correlation coefficient of -0.5 and smaller is considered a strong inverse relationship, while a correlation coefficient of -0.7 and smaller indicates a very strong inverse relationship. Correlation coefficients equal to 0.3 and up to 0.5 are considered moderately correlated (and -0.3 down to -0.5 are moderately, but inversely, related) (table 2).

When the number of variables is more than two and especially with the large number of variables in this study, the correlation coefficients may be arranged into a correlation matrix for easier comprehension. The correlation matrix also allows for inspection to determine whether the variables can be clustered into groups or categories.

A correlation matrix with the correlations between each pair of variables considered in this report can be found in appendix table 2.

There is more than one way of doing cluster analysis (Kendall). In the current context, cluster analysis is the process of examining the correlations between each possible combination of variables to determine if additional variables also are correlated to one or both of them. Cluster analysis reveals groups of variables where each variable is highly

correlated with the other variables in the group. As a result, one of the variables (or alternatively, a composite of all the variables) may be used to represent the sentiment of the producers around a theme.

Findings

The distribution of the respondents’ ratings for each key factor associated with member satisfaction with their cooperative are presented in tables 3 and 4. Some highlights are:

- 20.3 percent of the respondents indicated they were very satisfied with their cooperative overall.
- 18.1 percent were very satisfied with their cooperative’s board of directors, and 16.8 percent were very satisfied with their cooperative’s management.
- 34.7 percent were very satisfied with their cooperative’s bulk milk hauling services, more than for any other service asked about, but only one-half of that (15.2 percent) were very satisfied with their cooperative’s milk hauling policy.
- While a majority indicated that the cooperative kept them informed about operations and programs (63.0 percent), fewer indicated that they received as much information as they need (44.9 percent).
- The majority of respondents indicated that the cooperative’s offer of a secure market for their milk was a major reason for belonging to the cooperative (54.1 percent).

Correlation analysis—factors associated with member satisfaction with their cooperative

Table 2 Relative strength of linear correlation coefficient values

Strength of relationship	Positive correlation coefficient value	Negative correlation ¹ coefficient value
Perfectly related	1.0	-1.0
Very strong	0.7 to less than 1.0	-0.7 to greater than -1.0
Strong	0.5 to less than 0.7	-0.5 to greater than -0.7
Moderate	0.3 to less than 0.5	-0.3 to greater than -0.5
Weak	0.1 to less than 0.3	-0.1 to greater than -0.3
No relationship	0.0 to less than 0.1	0.0 to greater than -0.1

¹An inverse relationship where as one variable increases in value, the other decreases

Member satisfaction with their cooperative overall was most strongly correlated with member satisfaction with their cooperative’s management (table 5). Also, satisfaction with the cooperative overall was very strongly correlated with satisfaction with their cooperative’s pricing policies. Moreover, satisfaction with the cooperative

Table 3 Distribution of member responses for variables common to all surveys

Code	Item	Rating				
		1	2	3	4	5
		<i>Percent</i>				
		Very dissatisfied	Somewhat dissatisfied	Unsure	Somewhat satisfied	Very satisfied
S	Cooperative overall	3.9	7.3	7.4	61.1	20.3
P1	Cooperative's pricing policies	5.1	16.4	16.2	50.6	11.8
O2	Co-op's management of operating and marketing costs	5.9	10.9	28.1	45.0	10.1
O4	Cooperative management	4.6	9.3	19.5	49.8	16.8
G4	Cooperative board of directors	2.8	5.5	21.7	52.0	18.1
		<i>Percent</i>				
		Strongly disagree	Disagree	Unsure	Agree	Strongly agree
P2	Cooperative pays members fairly for their milk	5.7	11.7	22.3	49.3	11.1
P3	Cooperative's practice of paying different milk prices by area is justified	10.8	21.0	37.4	26.2	4.6
O3	Co-op is more concerned about operations than about its members	4.4	36.0	27.2	22.9	9.4
S6	Co-op does a good job of marketing my milk and returns the best price for my milk	9.3	14.2	30.9	40.5	5.0
I1	Cooperative keeps members well informed about its operations and programs	6.0	14.0	17.1	53.4	9.6
I2	Members receive as much information as they need about operations and programs	7.1	22.2	25.9	43.0	1.9
C1	I feel I am part owner of the coop	5.2	12.6	12.5	56.1	13.5
C2	Belonging to the cooperative is important part of my identity as a farmer	5.3	20.4	19.0	45.5	9.7
C3	The cooperative is just another place to do business	5.0	44.0	14.0	33.1	4.0
C6	I would discontinue my membership with the co-op if an alternative was available	16.5	42.4	29.5	7.3	4.3
G1	Cooperative members have a great amount of influence on how cooperative is run	9.1	27.2	25.4	35.6	2.7
G2	Satisfied with the amount of influence I have on how co-op is run	8.4	21.0	25.9	41.5	3.1
CP1	Co-op year-end earnings are considered a return on your investment	4.7	8.7	18.3	58.4	10.0
CP2	Co-op pays patronage refunds in proportion to patronage	2.9	5.8	24.9	56.2	10.3
CP3	Co-op supports cooperative education for members and the public	1.0	4.1	30.9	57.9	6.0
CP4	Co-op works appropriately with other agricultural cooperatives	1.4	3.7	44.1	45.2	5.5
CP5	Cooperative tries to cover too big an area as an organization	10.5	44.6	28.9	10.7	5.4
		<i>Percent</i>				
		Very dissatisfied	Somewhat dissatisfied	Unsure	Somewhat satisfied	Very satisfied
S1	Bulk milk hauling services (farm pick up services)	1.8	2.9	24.3	36.2	34.7
S2	Field representation (farm visits, interface between producers and coop)	4.9	8.2	33.6	32.9	20.4
S3	Laboratory services	2.4	5.9	33.9	34.5	23.4
S4	Providing marketing information	2.5	7.4	39.5	35.5	15.1
S5	Milk hauling policy	9.7	18.7	15.7	40.7	15.2

Table 4 Distribution of responses for reasons for belonging

Item	Major reason	Minor reason	Not a reason
-----Percent-----			
Cooperative offers a secure market for my milk	54.1	24.7	21.0
My belief in the cooperative model	41.0	31.8	26.5
Cooperative's pay prices	25.2	30.0	44.8
I have no alternatives	24.8	12.7	61.1
Cooperative's component and quality testing	23.9	34.8	40.8
Cooperative offers more on-farm services	12.9	31.3	55.8
Cooperative's hauling program	12.9	30.6	56.0
Cooperative has fewer smaller special assessments/deductions	9.5	32.0	58.5

Table 5 Factors strongly and very strongly correlated with member overall satisfaction with their cooperative

	Correlation coefficient ¹
Satisfaction with...	
Cooperative's management	0.7448
Cooperative's pricing policies	0.7064
Level of agreement that...	
Cooperative does a good job of marketing members' milk and returns the best price for their milk ²	0.6537
Satisfaction with...	
Cooperative's management of operating and marketing costs	0.6519
Cooperative's board of directors	0.5940
Level of agreement that...	
Member would drop out if an alternative was available	(0.5966)

¹ See table 2.

² 815 survey responses, question not included in survey #1.

overall was strongly related to agreement that the cooperative does a good job of marketing members' milk and returns the best price for their milk.

In addition, member satisfaction with the cooperative overall was strongly related to satisfaction with their cooperative's management of operating and marketing costs, and satisfaction with the cooperative's board of directors. All but one reflect corporate-level issues that concern how well the cooperative is run (board and management) and items that affect members' pocketbooks (pay prices and cooperative costs).

As might be expected, the more satisfied members were with their cooperative, the less likely they were to drop out or vice versa. This is indicated by

the strong, inverse relationship (correlation coefficient -0.5966) between satisfaction with the cooperative overall and agreement that they would drop out of the cooperative if an alternative is available.

Three communication (member relations) issues were strongly correlated with members' satisfying feelings toward the cooperative (table 6). Agreement that their cooperative keeps them well informed about its operations was strongly correlated with overall satisfaction with the cooperative. Similarly, member opinion on the influence they had in the cooperative, and level of satisfaction with their influence on how the cooperative is run, were both strongly related to overall satisfaction.

Quite a few items were moderately correlated with overall satisfaction with the cooperative (table 7). These include items similar to those identified above that affect member's pocketbooks

(agreement that cooperative pays all members fairly for their milk), and communication (agreement that members receive as much information as they need about operations and programs).

Also moderately correlated with overall satisfaction are items concerning members' feelings of connection to their cooperative. Disagreement that the cooperative was more concerned about operations than the members was moderately associated with a higher satisfaction level with the cooperative overall. (In other words, a satisfied member tended to view the cooperative as not more concerned about its operations than about its members--and vice versa.)

Agreement that belonging to the cooperative is an

important part of the member’s identity as a farmer and that the member feels that he or she is part owner of the cooperative were moderately related with the level of satisfaction with the cooperative overall. Furthermore, agreement that the cooperative is just another place to do business was inversely related to overall satisfaction with the cooperative. This indicates member satisfaction with their cooperative overall is moderately correlated with a view of their cooperative as a unique organization.

Five service aspects were asked about in the surveys. Individual surveys asked other questions about services provided by the cooperative, but these five were comparable across surveys: level of satisfaction with the cooperative’s provision of market information, ...its milk hauling policies, ...the cooperative’s field representative, ... the cooperative’s laboratory services, and ...the cooperative’s milk hauling services (table 8). However, satisfaction with milk hauling services (operating or arranging routes) was weakly correlated with satisfaction with the cooperative (0.2274).

The relatively weaker correlation between member satisfaction with their cooperative and satisfaction with the various services provided by or through the cooperative may be because of the individualistic nature of the relationships between service provider and member. Members may hold service providers—such as field representatives and milk haulers whom they have direct contact with—accountable for the quality of the services provided rather than the cooperative itself.

Member satisfaction with their cooperative may be more heavily influenced by how the cooperative guides the provision of these services. For example, member satisfaction with, or rating of, the cooperatives’ milk hauling policy is more strongly correlated with satisfaction with the cooperative overall

Table 6 Communication factors strongly correlated with member overall satisfaction with their cooperative

	Correlation coefficient ¹
Level of agreement that...	
Co-op keeps me well informed about its operations	0.5467
Satisfied with amount of influence on how co-op is run	0.5246
Members have a great amount of influence on how co-op is run	0.5216

¹ See table 2.

Table 7 Moderate correlations between member overall satisfaction with their cooperative and member connection with their cooperative

	Correlation coefficient ¹
Level of agreement that...	
Co-op is more concerned about operations than its members	(0.4971)
Belonging to the cooperative is an important part of the member’s identity as a farmer	0.4527
Member feels he or she is part owner of the cooperative	0.4567
The cooperative is just another place to do business	(0.3561)

¹ See table 2.

than was member’s rating of the milk hauling service itself.

While member satisfaction with the cooperative was moderately related to satisfaction with, or rating of, these services provided by the cooperative, the fact that they were not more strongly correlated does not necessarily mean that the provision of, or quality of, services the cooperative supplies are not important to member satisfaction. It just may mean that member unhappiness with certain aspects of the services provided may or may not translate into overall dissatisfaction with the cooperative, depending on the nature of the specific trouble.

The surveys also asked members about their agreement with various statements on the perceptions of cooperative principles and practices. Of the items similar across the four surveys, none were strongly correlated with member overall satisfaction with the cooperative, but seven were moderately correlated (table 9).

Items concerning milk pricing and communication – that the cooperative pays all members fairly for their milk and that members receive as much information as they need about operations and pro-

Table 8 Moderate correlations between overall satisfaction with the cooperative and services provided by cooperatives

	Correlation coefficient ¹
Satisfaction with...	
Cooperative's provision of market information	0.4907
Coop's milk hauling policy ²	0.4300
Field representation (farm visits, interface between producers and cooperative)	0.3490
Laboratory services (component and quality tests, and reports)	0.3375

¹ See table 2.

² 815 survey responses, question not included in survey #1

Table 9 Moderate correlations between overall satisfaction with the cooperative and level of agreement with statements on cooperative principles and practices

	Correlation coefficient ¹
Satisfaction with...	
Cooperative pays all members fairly for their milk	0.4779
Cooperative members receive as much information as they need about operations and programs	0.4770
The cooperative tries to cover too big an area as an organization	(0.3934)
The cooperative's year-end earnings are considered a return on member's investment.	0.3832
The cooperative works appropriately with other agricultural cooperatives	0.3726
The cooperative pays patronage refunds in proportion to patronage	0.3559
The cooperative supports cooperative education for members and the public	0.3480

¹ See table 2.

grams – were moderately correlated with member satisfaction with their cooperative. Agreement that the cooperative tries to cover too big an area as an organization was inversely related to the level of satisfaction with the cooperative overall. In other words, by and large, members who were satisfied with their cooperative did not agree that their cooperative tried to cover too big an area.

The level of agreement with the statements that the cooperative's earnings were a return on the member's investment, and that the cooperative paid patronage in proportion to the member's patronage, were both moderately associated with overall satisfaction with the cooperative. Likewise, agreement that their cooperative works appropriately with other agricultural cooperatives and that it supports cooperative education for members and the

public were also moderately correlated with the level of satisfaction with the cooperative overall.

That these correlations were not stronger may indicate that, for some members, satisfaction with the cooperative does not depend on whether or not their cooperative practices these principles, or perhaps whether or not the members are aware of their cooperative's practices.

Cluster analysis: relationships between factors associated with member satisfaction

Examining the correlation between each pair of variables reveals those that “cluster” or group together. The cluster then suggests that the items belonging to it are interrelated or may be equivalent in the respondent's mind.

Cluster analysis may be approached in different ways. This exercise was carried out by examining the correlation

matrix (appendix table 2) to identify pairs of variables that are highly correlated. Additional variables that highly correlate with this particular set of variables were then sought (Kendall pp 32-35). For this method, variables that are strongly correlated are considered to cluster together.

A strict requirement is imposed on the matrix to screen for variables that are each related to every other variable in the cluster with a correlation coefficient of 0.5000 or greater, and the others are excluded. (The variable, “member satisfaction with the cooperative overall,” is not used here in discovering the clusters.)

Two variables—member satisfaction with the cooperative's management of operating and marketing costs and member satisfaction with cooperative

management—are the most strongly correlated (0.7316) and form the nucleus of a “corporate management” cluster. Two other variables are also strongly correlated with these items as well as with each other. They are satisfaction with the cooperative’s pricing policies and with the cooperative’s board of directors.

Table 10 shows these variables that are strongly correlated with each other. The four variables in this cluster are also the variables that are most highly correlated with member satisfaction with the cooperative overall (table 5). Together these relationships indicate that members hold management accountable for the cooperative’s milk pricing policies and management of operating and marketing costs—the aspects most important to their pocketbooks and to their satisfaction level with their cooperative.

Since satisfaction with the cooperative’s board of directors is very strongly correlated with satisfaction with cooperative management, it could be that members view capable management as a reflection of the board doing a good job of setting policy and supervising management.

This group of variables (corporate management cluster) is of particular interest. If members are satisfied with the cooperative’s pricing policies and with how the cooperative manages its costs, it could be quite certain that they are also satisfied with the cooperative’s management and the board. Conversely, if they are satisfied with the cooperative’s management and the board, it could be pretty sure that they are also satisfied with the cooperative’s

policies related to milk marketing and pocketbook issues.

Next, these variables are removed from further consideration, and the remaining variables are examined for the strength of their relationships to each other. Four variables formed a “governance” cluster (table 11). Member satisfaction with the amount of influence on how the cooperative is run is most strongly correlated with agreement that members have a great amount of influence on how it is run

Table 10 Corporate management cluster

Satisfaction with...	Satisfaction with cooperative's...		
	Management	Pricing policies	Management of operating and marketing costs
	Correlation Coefficient ¹		
Cooperative's pricing policies	0.6516		
Cooperative's management of operating and marketing costs	0.7316	0.5956	
Cooperative's board of directors	0.7129	0.5128	0.5488

¹ See table 2.

Note: these variables all are strongly correlated with member satisfaction with the cooperative overall.

Table 11 Governance cluster

Agreement that...	Agreement that...		
	Co-op keeps me well informed about its operations	Members receive as much information as they need about operations and programs	Members have a great amount of influence on how cooperative is run
	Correlation Coefficient ¹		
Members receive as much information as they need about operations and programs	0.6203		
Members have a great amount of influence on how cooperative is run	0.5578	0.6397	
The amount of influence member has on how cooperative is run	0.5354	0.6596	0.6672

¹ See table 2.

Note: All but “cooperative members receive as much information as they need about operations and programs” is strongly correlated with satisfaction with the cooperative overall.

and forms the core of this second cluster. Agreement that they receive as much information as they need about operations and programs is also strongly correlated with each of these two items.

Likewise, agreement that members have a great amount of influence on how the cooperative is run is strongly correlated to agreement that members receive as much information as they need about operations and programs. This second cluster indicates that communication and member influence are related to each other.

Three of the variables in this cluster are strongly correlated with member overall satisfaction with their cooperative (table 6), while the remaining item (“cooperative members receive as much information as they need about operations and programs”) is moderately correlated with overall satisfaction (table 7).

After removing these two groups of variables from consideration, no more clusters emerged. Six pairs of variables remained that are strongly correlated. One of these pairs, “agreement that the cooperative does a good job of marketing member’s milk and returns the best price for it” and “member would drop out if an alternative were available” was strongly, inversely correlated (-0.5306) and both of the variables in this pair are strongly correlated with member satisfaction with the cooperative overall.

In summary, variables in each cluster above are strongly or very strongly correlated with each other. No other variables could be included because their correlations with these variables were not strong enough (correlation coefficients less than 0.5000), nor were any additional clusters evident.

Correlation and clustering analyses in this report are useful in focusing attention on the actions that the cooperative may take to make members more satisfied. The first priority is the variables included in the corporate management cluster: a competent board of directors and a capable management team that would do the best job of marketing member milk, minimizing operating costs, and setting satisfactory milk pricing policies in place.

The second priority is the governance cluster: a sound communication mechanism in order to keep members well informed of its operations and to receive feedback from members regarding their wishes and concerns.

Discussion

The survey data is examined and reported on as a single data set. However, each survey had a different number of observations, and one may wonder if one survey might sway the overall results. In an attempt to mitigate any potential impact due to unequal numbers of observations from the individual surveys, correlations are also calculated for a dataset with an equal number of observations from each survey.

A sample of 190 observations each was drawn from surveys No. 1, No. 2 and No. 3 to match the number of observations from survey No. 4. And as a further check, correlation coefficients are also calculated for each survey individually. Results from the two methods, in addition to the average of the 4 correlation coefficients from each survey are summarized for selected variables in appendix table 3.

These exercises show that the relative strength of the correlation coefficients is fairly consistent among the different approaches to calculating them. It is clear that the most consistent factors related to member satisfaction are a cooperative’s:

- Management;
- Milk pricing policies;
- Management of its operating and marketing costs;
- Board of directors;
- Member relations.

There were just four variables where the strength category of the correlations with overall satisfaction varied from weak to strong among the 4 surveys individually. These variables were agreement that the cooperative does a good job of marketing members’ milk and returns the best price for their milk; that they would drop out of the cooperative if an alternative was available; that cooperative members receive as much information as they need about operations and programs; and that the cooperative works appropriately with other agricultural cooperatives. What causes the variation between cooperatives and survey periods for these few variables is beyond the scope of this study.

Conclusions

Dairy farmers' livelihood depends on their milk being efficiently marketed and receiving the highest possible price for it. Without a doubt, all studies show that they cherish an assured market and high milk price. So it is natural that their satisfaction with their cooperative is tied closely to whether the cooperative does a good job of marketing their milk at a well-managed cost and returns the best milk price. Furthermore, they hold the cooperative management and board of directors in high regard for satisfying their main concerns, as the corporate management cluster in this report clearly indicates.

To enhance member satisfaction, first and foremost, members should elect a board that is competent in setting policies and recruiting and supervising a capable management team that does the best possible job of marketing members' milk. Secondly, the cooperative should devise a mechanism for members to exercise governance influences. Thirdly, the cooperative should have an education program to augment members' understanding of the milk market and the nature of the cooperative business model.

Last but not the least, the cooperative should ensure that service providers who are in direct personal contact with members are well trained in technical expertise as well as customer service.

The information presented here is gleaned from surveys designed for specific needs of the cooperatives involved. Therefore, it is possible there may be other important factors that play a role in members' satisfaction with their cooperatives that are not identified by the analysis of this data.

This study reveals important factors in member satisfaction. Cooperative may wish to focus atten-

tion on these items. It also may serve as a starting point for individual cooperatives wishing to conduct their own assessment of the sentiment among their members.

References

- Boynton, Robert D. and Emerson M. Babb. *Grade A Dairy Farmers' Perceptions of Milk Buyer Performance: The Findings of a National Survey, Station Bulletin No. 367*, Agricultural Experiment Station, Purdue University, West Lafayette, IN, March 1982.
- Freedman, David, Robert Pisani and Roger Purves. *Statistics, third edition*, W.W. Norton and Company, New York, London, 1998, Chapters 8 and 9.
- Gray, Thomas W. *Structure for the Agriculture-of-the-Middle Initiative*. Research Report 216, U.S. Department of Agriculture, Rural Development, Rural Business-Cooperative Service, March 2009.
- Kendall, Maurice. *Multivariate Analysis*, Hafner Press, New York, 1975, Chapters 1 and 3.
- Kitchens, Larry J. *Exploring Statistics, Second Edition*, Duxbury Press, Washington, 1998. Pages 177-180.
- Liebrand, Carolyn, Dale M. Carley, K. Charles Ling. *Southern Dairy Farmers' Evaluation of Milk Handlers, ACS Research Report No. 97*, U.S. Department of Agriculture, Agricultural Cooperative Service, Washington, DC, September 1991.
- Liebrand, Carolyn, and K. Charles Ling. *Value of Cooperative Benefits to Southern Dairy Farmers, ACS Research Report No. 99*, U.S. Department of Agriculture, Agricultural Cooperative Service, Washington, DC, October 1991.

Appendix Table 1.1 Survey Questions

Topic	Code	Question (Survey #4)	Alternative wording		
			Survey #3	Survey #2	Survey #1
	S	Satisfaction level with Co-op overall <i>Satisfaction level with...</i>	- same -	- same -	- same -
PRICING	P1	Cooperative's pricing policies <i>Level of agreement that...</i>	Milk pricing policies (competitiveness, bonus programs)	Milk pricing policies (competitiveness, bonus programs) RATING: POOR (1) -EXCELLENT(5)	- same -
	P2	Cooperative pays members fairly for their milk	Cooperative pays all members fairly for their milk	Cooperative pays all members fairly for their milk	Cooperative pays all members fairly for their milk
	P3	Cooperative's practice of paying different milk prices by region is justified	- same -	Cooperative's practice of paying different milk prices by area is justified	Cooperative's practice of paying different milk prices by area is justified
	P4	Where one lives within cooperative's territory affects how fair a price one gets for their milk.	- same -	- same -	- same -
SERVICES	S1	Bulk milk hauling services (farm pick up services) <i>Satisfaction level with...</i>	- same -	Bulk milk hauling service (operating or arranging routes)	Milk hauling (operating or arranging routes)
	S2	Field representation (farm visits, interface between producers and coop)	- same wording – RATING: POOR (1) -EXCELLENT(5)	Field staff performance (farm visits, interface between producers and corporate) RATING: POOR (1) -EXCELLENT(5)	Performing field services (assisting in milk production and quality problems) RATING: POOR (1)- EXCELLENT(5)
	S3	Laboratory services (component and quality tests, and reports)	- same wording – RATING: POOR (1)-EX- CELLENT(5)	Laboratory services (component and quality tests, and bulk tank tests) RATING: POOR (1)-EXCELLENT(5)	Checking milk weights and tests RATING: POOR (1) -EXCELLENT(5)
	S4	Providing market information	Providing economic information RATING: POOR (1) -EXCELLENT(5)	Providing marketing information RATING: POOR (1) -EXCELLENT(5)	Providing milk marketing information RATING: POOR (1) -EXCELLENT(5)
	S5	Cooperative's milk hauling policy	Coop's milk hauling services (hauling rates, volume discounts)	Coop's milk hauling services (hauling rates, volume discounts)	- not asked -

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Appendix Table 1.1 **Survey Questions (continued)**

Topic	Code	Question (Survey #4)	Alternative wording		
			Survey #3	Survey #2	Survey #1
		<i>Level of agreement that...</i>			
OPERA-TIONS	O1	Co-op operations should be the concern of <u>only</u> co-op management	The operation of the co-op should be the concern of <u>only</u> the management	The operation of the co-op should be the concern of only the management	The operation of the co-op should be the concern of <u>only</u> the management
		<i>Satisfaction level with...</i>			
	O2	Coop's management of operating and marketing costs	Coop's ability to hold down operating and marketing costs	Coop's ability to hold down operating and marketing costs	Coop's ability to hold down operating and marketing costs
		<i>Level of agreement that...</i>			
	O3	Co-op is more concerned about operations than about its members	- same -	- same -	- same -
		<i>Satisfaction level with...</i>			
	O4	Cooperative's management	- same -	- same -	- same -
		<i>Level of agreement that...</i>			
	S6	Co-op does a good job of marketing my milk and returns the best price for my milk	- same -	- same -	- not asked -
GOVERNANCE	G1	Cooperative members have a great amount of influence on how cooperative is run	- same -	- same -	- same -
	G2	Satisfied with the amount of influence I have on how co-op is run	- same -	- same -	- same -
	G3	Members have too much say on how the co-op is run	Members have too much say about how the co-op is run	Members have too much say about how the co-op is run	Members have <u>too much</u> say about how the co-op is run
		<i>Satisfaction level with...</i>			
	G4	Cooperative's board of directors	Cooperative corporate director	Cooperative corporate director	- same -
PRACTICE OF CO-OP PRINCIPLES	CP1	Co-op year-end earnings are considered a return on your investment.	- same -	- same -	I consider co-op earnings a return on my investment in the coop
	CP2	Co-op pays patronage refunds in proportion to patronage	- same -	- same -	- same -

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Appendix Table 1.1 Survey Questions (continued)

Topic	Code	Question (Survey #4)	Alternative wording		
			Survey #3	Survey #2	Survey #1
	CP3	Co-op supports cooperative education for members and the public	Co-op supports education for members and the public	Co-op supports education for members and the public	Co-op supports education for members and the public
	CP4	Co-op works appropriately with other agricultural coops	- same -	- same -	Co-op works with other coops in milk pricing and marketing
	CP5	Cooperative tries to cover too big an area as an organization	- same -	- same -	- same -
	CP6	Every dairy farmer should have a choice of more than one place to sell their milk	- same -	- same -	- same -
		<i>Level of agreement that...</i>			
MEMBER CONNEC- TION	C1	I feel I am part owner of the coop	- same -	- same -	- same -
	C2	Belonging to the cooperative is important part of my identity as a farmer	- same -	- same -	- same -
	C3	The cooperative is just another place to do business	- same -	- same -	- same -
	C4	I would be willing to assume a leadership role within the coop	I would be willing to assume a leadership role to improve the coop	I would be willing to assume a leadership role to improve the coop	I would be willing to assume a leadership role to improve the coop
	C5	I don't have time to attend most co-op functions	- same -	I don't have time to attend most co-op functions or activities	Lack of time prevents me from attending most co-op functions or activities
	C6	I would discontinue my membership with co-op if an alternative was available	I would drop out of co-op if an alternative was available	I would drop out of co-op if an alternative was available	I would drop out of co-op if an alternative was available
	I1	Cooperative keeps members well informed about its operations and programs	Cooperative keeps members well informed about its operations	Cooperative keeps members well informed about its operations	Cooperative keeps members well informed about its operations
	I2	Co-op members receive as much information as they need about operations and programs	- same -	- same -	- same -

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Appendix Table 1.1 **Survey Questions (continued)**

Topic	Question (Survey #4)	Alternative wording		
		Survey #3	Survey #2	Survey #1
REASON FOR BELONGING	Cooperative's pay prices	Cooperative pays higher milk prices	Cooperative pays higher milk prices	Cooperative pays higher milk prices
	Cooperative has fewer smaller special assessments/deductions	- same -	- same -	- same -
	Cooperative offers more on-farm services	Cooperative offers more on-farm services than other buyers	Cooperative offers more on-farm services than other buyers	Cooperative offers more on-farm services than other buyers
	Cooperative offers a secure market for my milk	Cooperative offers more assurance of a market for my milk	Cooperative offers more assurance of a market for my milk	Cooperative offers more assurance of a market for my milk
	My belief in the cooperative model	My belief in the cooperative form of business	My belief in the cooperative form of business	My belief in the cooperative form of business
	Co-op's hauling program	Co-op charges lower hauling rates	Co-op charges lower hauling rates	Co-op charges lower hauling rates

Appendix Table 1.2 **Rating Scales**

Code	Opinion on the statements	Opinion on the statements	Rating	Opinion on reason for belonging
1	Strongly disagree	Very dissatisfied	Poor	Major
2	Disagree	Somewhat dissatisfied	Below Average	Minor
3	Unsure	Unsure	Unsure	Not a reason
4	Agree	Somewhat satisfied	Above average	
5	Strongly agree	Very Satisfied	Excellent	

Appendix Table 2 Correlation matrix, membership survey data, 1,736 dairy farmer responses

Code	S	P1	P2	P3	P4	S1	S2	S3	S4	S5	S6	I1	I2
Correlation Coefficient [†]													
P1	0.7064	1.0000											
P2	0.4779	0.5600	1.0000										
P3	0.1907	0.2304	0.2301	1.0000									
P4	(0.1218)	(0.1510)	(0.2025)	0.1250	1.0000								
S1	0.2274	0.2107	0.2149	0.1150	(0.0725)	1.0000							
S2	0.3490	0.2960	0.2741	0.1808	(0.0592)	0.2792	1.0000						
S3	0.3375	0.3457	0.2386	0.2082	(0.0704)	0.3759	0.4300	1.0000					
S4	0.4907	0.4307	0.3468	0.1225	(0.1380)	0.2629	0.3801	0.4189	1.0000				
S5	0.4300	0.5031	0.3554	0.2614	(0.1724)	0.4338	0.2175	0.3563	0.3076	1.0000			
S6	0.6537	0.6187	0.5501	0.3053	(0.1523)	0.2356	0.2886	0.3282	0.4391	0.3663	1.0000		
I1	0.5467	0.4793	0.4389	0.0750	(0.1699)	0.1800	0.3024	0.2076	0.4761	0.3643	0.4949	1.0000	
I2	0.4770	0.4487	0.4085	0.1120	(0.1526)	0.1662	0.2830	0.1842	0.4262	0.3458	0.4617	0.6203	1.0000
C1	0.4567	0.4128	0.3946	0.2268	(0.1107)	0.1346	0.2533	0.2198	0.3353	0.3162	0.4733	0.4164	0.4391
C2	0.4527	0.3909	0.3732	0.1894	(0.0839)	0.1471	0.2327	0.2331	0.3131	0.2705	0.4628	0.3817	0.3829
C3	(0.3561)	(0.3356)	(0.3092)	(0.1332)	0.1017	(0.1135)	(0.2120)	(0.2028)	(0.2712)	(0.1883)	(0.3517)	(0.2770)	(0.2752)
C4	0.0548	0.0343	0.0300	0.0981	(0.0242)	0.0174	0.0336	0.0663	0.0210	(0.0374)	(0.0473)	(0.0520)	(0.0445)
C5	(0.0104)	(0.0391)	(0.0005)	(0.1636)	(0.0501)	0.0250	(0.0758)	(0.0676)	(0.0204)	0.0276	(0.0692)	0.0444	0.0053
C6	(0.5966)	(0.5370)	(0.4444)	(0.1605)	0.1485	(0.1944)	(0.2822)	(0.2559)	(0.4014)	(0.3562)	(0.5306)	(0.4769)	(0.4030)
G1	0.5216	0.4915	0.4581	0.1505	(0.1865)	0.1602	0.2856	0.2233	0.4065	0.3466	0.5213	0.5578	0.6397
G2	0.5246	0.4762	0.4292	0.1782	(0.1695)	0.1233	0.3185	0.2380	0.3950	0.3605	0.5026	0.5354	0.6596
G3	0.1736	0.1403	0.1232	0.0717	(0.0031)	0.0303	0.0905	0.0249	0.0683	0.1554	0.2254	0.1558	0.2059
G4	0.5940	0.5128	0.3849	0.2091	(0.0975)	0.1759	0.3232	0.3057	0.4215	0.3396	0.4612	0.4455	0.4326
O1	0.1081	0.0787	0.0640	0.0587	0.0229	0.0027	0.0530	0.0228	0.0512	0.1246	0.1729	0.0797	0.1461
O2	0.6519	0.5956	0.4821	0.1834	(0.1660)	0.2275	0.2962	0.2976	0.4710	0.4124	0.6163	0.5202	0.5185
O3	(0.4971)	(0.5040)	(0.4724)	(0.2104)	0.2067	(0.1628)	(0.3147)	(0.2188)	(0.3881)	(0.3407)	(0.4756)	(0.4756)	(0.4969)
O4	0.7448	0.6516	0.4781	0.2115	(0.1495)	0.2065	0.3505	0.3280	0.4820	0.4440	0.6279	0.5646	0.5348
CP1	0.3832	0.3700	0.3966	0.1543	(0.0920)	0.1401	0.1615	0.1741	0.2942	0.2362	0.3546	0.3789	0.3864
CP2	0.3559	0.3646	0.3477	0.1614	(0.0954)	0.1412	0.1503	0.1655	0.2351	0.2540	0.3352	0.3179	0.3001
CP3	0.3480	0.3186	0.3295	0.1709	(0.0960)	0.1645	0.1998	0.1890	0.3182	0.2274	0.3196	0.3356	0.3289
CP4	0.3726	0.3266	0.3237	0.2037	(0.0510)	0.1356	0.1957	0.1885	0.2871	0.2172	0.3985	0.3210	0.3000
CP5	(0.3934)	(0.3460)	(0.3525)	(0.1630)	0.1992	(0.1493)	(0.1824)	(0.1815)	(0.2926)	(0.2251)	(0.3384)	(0.3055)	(0.3049)
CP6	(0.2049)	(0.2194)	(0.1800)	(0.1068)	0.0849	(0.0481)	(0.0729)	(0.1109)	(0.0835)	(0.2081)	(0.3133)	(0.1910)	(0.1614)

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NOTE: See Appendix Table 1.1 description of the codes.

Appendix Table 2 **Correlation matrix, membership survey data, 1,736 dairy farmer responses (continued)**

Code	C1	C2	C3	C4	C5	C6	G1	G2	G3	G4	O1	O2	O3	O4
Correlation Coefficient ¹														
P1														
P2														
P3														
P4														
S1														
S2														
S3														
S4														
S5														
S6														
I1														
I2														
C1	1.0000													
C2	0.6227	1.0000												
C3	(0.4298)	(0.5360)	1.0000											
C4	0.1308	0.1330	(0.1601)	1.0000										
C5	(0.1164)	(0.1124)	0.1254	(0.2613)	1.0000									
C6	(0.4330)	(0.4659)	0.4124	(0.0914)	0.0568	1.0000								
G1	0.5198	0.4944	(0.3696)	0.0736	(0.0524)	(0.4692)	1.0000							
G2	0.4881	0.4401	(0.3301)	0.0246	(0.0616)	(0.4696)	0.6672	1.0000						
G3	0.1094	0.1326	0.0287	(0.1002)	0.0565	(0.0632)	0.1851	0.1861	1.0000					
G4	0.4206	0.3918	(0.3346)	0.0797	(0.1144)	(0.4483)	0.4696	0.4785	0.1182	1.0000				
O1	0.0640	0.1036	0.0549	(0.1179)	0.0383	(0.0589)	0.0893	0.1481	0.3639	0.1002	1.0000			
O2	0.4221	0.4440	(0.3262)	0.0247	(0.0104)	(0.5467)	0.5387	0.5161	0.1742	0.5488	0.1069	1.0000		
O3	(0.4599)	(0.4217)	0.4027	(0.0487)	0.0473	0.4932	(0.5804)	(0.5133)	(0.1216)	(0.4223)	(0.0370)	(0.5223)	1.0000	
O4	0.4862	0.4656	(0.3689)	0.0410	(0.0573)	(0.5631)	0.5757	0.5658	0.1838	0.7129	0.1477	0.7316	(0.5378)	1.0000
CP1	0.5034	0.4310	(0.3395)	0.0834	(0.0366)	(0.3798)	0.4194	0.3897	0.0926	0.3579	0.0771	0.4102	(0.3740)	0.4183
CP2	0.3829	0.3128	(0.2203)	0.1348	(0.0749)	(0.3404)	0.3747	0.3395	0.0475	0.3008	0.0349	0.3387	(0.3075)	0.3609
CP3	0.3635	0.3125	(0.2605)	0.1157	(0.0556)	(0.3272)	0.3714	0.3467	0.0072	0.3335	(0.0120)	0.3472	(0.3103)	0.3469
CP4	0.3278	0.3038	(0.2178)	0.1069	(0.1196)	(0.3101)	0.3695	0.3202	0.0115	0.3341	0.0065	0.3390	(0.2883)	0.3703
CP5	(0.3148)	(0.2819)	0.2816	(0.1265)	0.0724	0.4180	(0.3388)	(0.3201)	(0.0137)	(0.3315)	(0.0194)	(0.3751)	0.3888	(0.3842)
CP6	(0.1778)	(0.2256)	0.1644	(0.0017)	0.0400	0.2376	(0.1930)	(0.1952)	(0.1391)	(0.1883)	(0.1582)	(0.1751)	0.1826	(0.2234)

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Appendix Table 2**Correlation matrix, membership survey data, 1,736 dairy farmer responses (continued)**

Code	CP1	CP2	CP3	CP4	CP5	CP6
Correlation Coefficient ¹						
P1						
P2						
P3						
P4						
S1						
S2						
S3						
S4						
S5						
S6						
I1						
I2						
C1						
C2						
C3						
C4						
C5						
C6						
G1						
G2						
G3						
G4						
O1						
O2						
O3						
O4						
CP1	1.0000					
CP2	0.5546	1.0000				
CP3	0.3609	0.3637	1.0000			
CP4	0.3340	0.3515	0.4794	1.0000		
CP5	<i>(0.2731)</i>	<i>(0.2684)</i>	<i>(0.2481)</i>	<i>(0.2524)</i>	1.0000	
CP6	<i>(0.1550)</i>	<i>(0.1432)</i>	<i>(0.0748)</i>	<i>(0.0933)</i>	0.1551	1.0000

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¹ Strength category of the correlation coefficients:**Red** indicates very strong correlation**Bold** indicates strong correlation

Regular font indicates moderate correlation

Italics indicates weak correlation

Appendix Table 3.1 Comparison of correlation coefficients, entire database, equal number of observations, and 4-survey average

Variable	Code	Entire database ¹	Equal samples ²	4-survey average ³	Entire database ¹	Equal samples ²	4- survey average ³
Correlation with satisfaction with cooperative overall				Strength category of correlation ⁴			
<i>Table 4:</i>							
Satisfaction with cooperative's management	O4	0.7448	0.7857	0.7231	VS	VS	VS
Satisfaction with cooperative's pricing policies	P1	0.7064	0.7251	0.6904	VS	VS	S
Cooperative does a good job of marketing member's milk and returns the best price ⁵	S6	0.6537	0.6699	0.5868	S	S	S
Satisfaction with cooperative's management of operating and marketing costs	O2	0.6519	0.6825	0.6210	S	S	S
Member would drop out if an alternative available	C6	(0.5966)	(0.5924)	(0.5370)	S	S	S
Satisfaction with cooperative board of directors	G4	0.5940	0.5947	0.5843	S	S	S
<i>Table 5:</i>							
Cooperative keeps member well informed about its operations	I1	0.5467	0.5730	0.4996	S	S	M
Satisfied with amount of influence on how cooperative is run	G2	0.5246	0.5525	0.4944	S	S	M
Members have great amount of influence on how cooperative is run	G1	0.5216	0.5304	0.4785	S	S	M

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Appendix Table 3.1 Comparison of correlation coefficients, entire database, equal number of observations, and 4-survey average (*continued*)

Variable	Code	Entire database ¹	Equal samples ²	4-survey average ³	Entire database ¹	Equal samples ²	4- survey average ³
		Correlation with satisfaction with cooperative overall			Strength category of correlation ⁴		
<i>Table 6:</i>							
Cooperative is more concerned about operations than its members	O3	(0.4971)	(0.5027)	(0.4376)	M	S	M
Cooperative pays all members fairly for their milk	P2	0.4779	0.4855	0.4232	M	M	M
Members receive as much information as they need about operations and programs.	I2	0.4770	0.4951	0.4298	M	M	M
Member feels they are part owner of co-op	C1	0.4567	0.4708	0.4182	M	M	M
Belonging to cooperative is important part of member's identity as a farmer	C2	0.4527	0.4801	0.4108	M	M	M
Cooperative is just another place to do business	C3	(0.3561)	(0.3811)	(0.3263)	M	M	M
<i>Table 7:</i>							
Satisfaction with cooperative's provision of market information	S4	0.4907	0.5017	0.4630	M	S	M
Satisfaction with cooperative's milk hauling policy ⁵	S5	0.4300	0.4409	0.4257	M	M	M
Satisfaction with field representation (farm visits, interface)	S2	0.3490	0.3620	0.3691	M	M	M
Satisfaction with laboratory services	S3	0.3375	0.3767	0.3523	M	M	M

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Appendix Table 3.1 Comparison of correlation coefficients, entire database, equal number of observations, and 4-survey average (*continued*)

Variable	Code	Entire database ¹	Equal samples ²	4-survey average ³	Entire database ¹	Equal samples ²	4- survey average ³
Correlation with satisfaction with cooperative overall				Strength category of correlation ⁴			
<i>Table 8:</i>							
Cooperative tries to cover too big an area as an organization	CP5	(0.3934)	(0.4090)	(0.3467)	M	M	M
Member considers cooperative's year-end earnings a return on their investment	CP1	0.3832	0.3533	0.3103	M	M	M
Cooperative works appropriately with other agricultural cooperatives	CP4	0.3726	0.4092	0.3741	M	M	M
Cooperative pays patronage refunds in proportion to patronage	CP2	0.3559	0.3920	0.2822	M	M	W
Cooperative supports cooperative education for members and the public	CP3	0.3480	0.3223	0.3226	M	M	M
<i>Weak correlations:</i>							
Satisfaction with milk hauling (operating or arranging routes)	S1	0.2274	0.2296	0.2491	W	W	W
Every dairy farmer should have a choice of more than one place to sell their milk	CP6	(0.2049)	(0.2274)	(0.2099)	W	W	W
Cooperative's practice of paying different milk prices by area is justified	P3	0.1907	0.2234	0.2632	W	W	W
Members have too much say on how the cooperative is run	G3	0.1736	0.2439	0.1904	W	W	W

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Appendix Table 3.1 **Comparison of correlation coefficients, entire database, equal number of observations, and 4-survey average** (*continued*)

Variable	Code	Entire database ¹	Equal samples ²	4-survey average ³	Entire database ¹	Equal samples ²	4- survey average ³
Correlation with satisfaction with cooperative overall				Strength category of correlation ⁴			
<i>Weak correlations (continued):</i>							
Where one lives within the cooperative's territory affects how fair a price one gets for their milk	P4	<i>(0.1218)</i>	<i>(0.1623)</i>	<i>(0.0877)</i>	<i>W</i>	<i>W</i>	<i>W</i>
Cooperative operations should be the concern of only cooperative management	O1	<i>0.1081</i>	<i>0.1419</i>	<i>0.0852</i>	<i>W</i>	<i>W</i>	<i>W</i>
Member is willing to assume leadership role in cooperative	C4	<i>0.0548</i>	<i>0.0263</i>	<i>0.0336</i>	<i>W</i>	<i>W</i>	<i>W</i>
Member doesn't have time to attend most cooperative functions	C5	<i>(0.0104)</i>	<i>(0.0174)</i>	<i>(0.0358)</i>	<i>W</i>	<i>W</i>	<i>W</i>

¹ Entire data set of 1736 observations

² A sample of 190 observations each was drawn from surveys #1, #2 and #3 to match the number of observations from survey #4.

³ Average of the correlation coefficients from each of the 4 surveys

⁴ Strength category of the correlation coefficients: VS=Very strong, S=Strong, M=Moderate, W=Weak

Red indicates very strong correlation (VS)

Bold indicates strong correlation (S)

Regular font indicates moderate correlation (M)

Italics indicates weak correlation (W)

⁵ Question not asked in one of the surveys.

Appendix Table 3.2 Corporate management cluster, 4-survey average¹

	Satisfaction with cooperative's...		
	Management	Pricing policies	Management of operating and marketing costs
	Average Correlation Coefficient		
Satisfaction with...			
Cooperative's pricing policies	0.6279		
Cooperative's management of operating and marketing costs	0.7055	0.5728	
Cooperative's board of directors	0.7001	0.4829	0.5412
Level of agreement that...			
Cooperative does a good job of marketing members' milk and returns the best price for their milk ¹	0.5634	0.5880	0.5551

¹ Average of the correlation coefficients from each of the 4 surveys
Red indicates very strong correlation
Bold indicates strong correlation
Normal font indicates moderate correlation

Appendix Table 3.2.1 Corporate management cluster, equal number of observations¹

	Satisfaction with cooperative's...		
	Management	Pricing policies	Management of operating and marketing costs
	Average Correlation Coefficient		
Satisfaction with...			
Cooperative's pricing policies	0.6903		
Cooperative's management of operating and marketing costs	0.7494	0.6317	
Cooperative's board of directors	0.6987	0.4883	0.5625
Level of agreement that...			
Cooperative does a good job of marketing members' milk and returns the best price for their milk ¹	0.6432	0.6418	0.6440

¹ Average of the correlation coefficients from each of the 4 surveys
Red indicates very strong correlation
Bold indicates strong correlation
Normal font indicates moderate correlation

Appendix Table 3.3 Governance cluster, 4-survey average¹

	Satisfaction with cooperative's...		
	Co-op keeps me well informed about its operations	Members receive as much information as they need about operations and programs	Members have a great amount of influence on how cooperative is run
	Average Correlation Coefficient		
Agreement that...			
Members receive as much information as they need about operations and programs	0.6203		
Members have a great amount of influence on how cooperative is run	0.5578	0.6397	
Satisfaction with			
The amount of influence member has on how cooperative is run	0.5354	0.6596	0.6672

¹ Average of the correlation coefficients from each of the 4 surveys

Bold indicates strong correlation

Appendix Table 3.3.1 Governance cluster, equal number of observations¹

	Satisfaction with cooperative's...		
	Management	Pricing policies	Management of operating and marketing costs
	Average Correlation Coefficient		
Agreement that...			
Members receive as much information as they need about operations and programs	0.6292		
Members have a great amount of influence on how cooperative is run	0.5458	0.6035	
Satisfaction with			
The amount of influence member has on how cooperative is run	0.5290	0.6440	0.6830

¹ A sample of 190 observations each was drawn from surveys #1, #2 and #3 to match the number of observations from survey #4.

Bold indicates strong correlation

