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Satisfaction Evaluation of Milk Handlers by Southern U.S. Dairy Farmers

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ABSTRACT

An ordered probit model is used to investigate the factors that determine post-choice satisfaction of southeastern U.S. dairy farmers with their milk handlers. The impact on farmer satisfaction of milk handler attributes, farm/farmer characteristics, and farm location is tested. Results support the hypothesis that mailbox price and the quality of service provided by milk handlers have a positive effect on satisfaction levels. Bargaining-operating cooperatives are negatively associated with farmer satisfaction when contrasted against independently owned milk handlers and bargaining-only cooperatives. Choice and the ability to switch milk handlers are also important determinants of farmer satisfaction.

Key Words: bargaining-only cooperative, bargaining-operating cooperative, dairy, proprietary milk handler, satisfaction.

The formation of various types of support agencies within the dairy industry may be regarded as a designed response to an existing need within an industry. There are three major categories of milk handlers which represent a combination of choices that are available to dairy farmers within the southeastern region of the United States (Liebrand, Carley, and Ling, p. 1). A bargaining-operating cooperative functions as a sales representative and also owns and operates processing facilities. Bargaining-only cooperatives act solely as product sales representatives or brokers, but do not own processing facilities. The proprietary firms are void of a membership system and may buy up to 100% of their milk from cooperatives, depending on the supply from farmers who are not members of a cooperative. Liebrand, Carley, and Ling provide a descriptive statistical interpretation of survey results regarding issues such as satisfaction, choice of handlers, reasons for changing milk handlers, reasons for staying with the same milk handler, and member participation in their cooperatives.

Milk marketing cooperatives (MMCs) form an important part of the American milk handling operations. According to Liebrand, Carley, and Ling (p. i), approximately 80% of Grade A milk in the southern United States was being marketed by cooperatives at the time of their investigation. However, as reported by Carley (p. 1), the quantity of fluid milk marketed by cooperatives is on the decline, and the rate of decline is more notable

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in some southern states than in other areas of the U.S. For example, Alabama, Kentucky, Mississippi, and Tennessee together represent a decline in milk marketed through cooperatives from 84% in 1980 to 67% in 1987.

Recent U.S. Department of Agriculture (USDA) statistical surveys (published in its 1991 *Federal Milk Market Order Statistics* bulletin) have shown a 40% decrease in the number of dairy farmers supplying milk to distributing plants within the 13-state southeast U.S. region. Misra, Carley, and Fletcher (1993) further report that the total number of distribution plants within the same region decreased by 30% during the seven-year period from 1984–91, including some plants which were owned and operated by cooperatives (bargaining-operating). The authors reasoned that this apparent "change in buyer affiliations" may be a direct or indirect effect of farmers being dissatisfied with their cooperative outlets.

Our investigation goes beyond the earlier studies of Liebrand, Carley, and Ling, and Misra, Carley, and Fletcher (1992a, 1993) by expanding the scope of comparison to independent marketing agencies as well as cooperatives, and by assessing the factors that determine satisfaction levels. The present analysis identifies the relationship between farmers' satisfaction with milk handlers and the variables associated with milk handler attributes, farm/farmer characteristics, and the location of the farms.

Theoretical Model and Data Description

Several previous studies have demonstrated the influence of both price and nonprice factors on dairy farmer evaluations and choice of milk handlers. Analysis of producer satisfaction requires an extension of consumer behavior theory to view the farmer as a utility maximizer choosing among bundles of milk handler services and attributes in order to maximize satisfaction. The farmer's utility function reflects subjective expectations that are determined by farm/farmer characteristics and current situation, including the farmer's current milk handler. Therefore, a farmer's utility that is associated with a milk handler is shown as

$$(1) \qquad y_i = \beta' Z_i + \epsilon_i,$$

where y_i is the utility level attained by the farmer under situation i, and Z_i is a vector of explanatory variables including milk handler attributes (e.g., type of organization and services provided by the organization) and characteristics of the farm/farmer (e.g., the location of the farm, farmer's age and experience, and farm managerial and financial structure). The level of utility attained varies from situation to situation based on the deterministic components (Z_i) and a stochastic component (ϵ_i).

While the dependent variable, y_i, is unobserved, what is observed is the declared level of satisfaction represented by the rank-ordered dependent variable, u_i, where

$$(2) \qquad \begin{aligned} u_i &= 0 \quad \text{if } y_i \le \mu_0 \\ &= 1 \quad \text{if } \mu_0 < y_i \le \mu_1 \\ &= 2 \quad \text{if } \mu_1 < y_i \le \mu_2 \\ &= 3 \quad \text{if } \mu_2 < y_i. \end{aligned}$$

The μ notations denote unknown probability boundaries that are estimated with the estimated β parameters in equation (1) (Greene 1990; Maddala). The least favorable outcome (very dissatisfied) is defined as $u_i = 0$, and the most favorable outcome (very satisfied) is defined as $u_i = 3$. The dependent variable therefore has four ordered values that cover a range of the farmers' perceptions of the performance of their respective milk marketing agencies. The ordered probit model (Zavoina and McElvey; Ben-Akiva and Lerman; Greene 1990) was used to obtain parameter estimates for the above equations.

Data Description and Analysis

The data for this study are taken from a survey that was conducted in January 1989, on U.S. dairy farmers in a 12-state southeastern region. Of the 5,660 dairy farmers polled, 2,538 (44.8%) returned usable responses, representing 25% of the total number of Grade A dairy

farmers in the 12-state region (Misra, Carley, and Fletcher 1992b). The final response sample consisted of 1,365 observations,[1] of which 18% were responses received from non-cooperative (independent) farmers. This figure is comparable to farmer population estimates (Carley). Of the 1,365 observations, approximately 2.6% of the respondents indicated they were very dissatisfied with the performance of their milk marketing agencies, 8.4% were dissatisfied, 59% were satisfied, and 30% were very satisfied.

The independent variables chosen for inclusion in the model (table 1) reflect questions raised and relationships suggested by previous studies. The milk handler attributes consist of eight variables that collectively influence the farmers' satisfaction with the service provided by the respective milk handlers. Farmer characteristics were classified as (*a*) farm/farmer characteristics and (*b*) location (state).

Three binary variables, *BARG*, *OPBAR*, and *INDEP*, denoting the three different types of milk handler organizations, were included in the model. The separation of the two types of cooperatives in this study provides a means of testing for the importance of cooperative scope in influencing farmer satisfaction levels. Independent milk handlers were included for comparison with cooperatives, and specifically to test whether the movement away from cooperative milk handlers reflected an increase in expressed satisfaction with independent firms.

Price theory would lead us to expect a positive relationship between mailbox price (*MAIL*) and satisfaction level, and low explanatory power for the model without the inclusion of this variable. A number of studies support this contention, including Fornell and Robinson; Liebrand, Carley, and Ling; and Misra, Carley, and Fletcher (1992a, b). Misra, Carley, and Fletcher (1992b) also found a negative relationship between the level of deductions (*DEDUCTS*) taken by a cooperative and farmer choice of milk handler.

Investigations by Liebrand and Ling, and by Misra, Carley, and Fletcher (1992a) point to the guarantee of an assured market (*ASSURED*) as one of the main reasons for farmers choosing to remain with cooperatives. Several studies (Fornell and Robinson; Liebrand, Carley, and Ling; Misra, Carley, and Fletcher 1992a, b; Boynton and Babb; Coffey) all found that the quality and types of services (*FRIENDLY* and *SERVICE*) provided by cooperatives were also important to either farmer choice of, or satisfaction with, their milk handlers.

The relationship between the degree of competition/concentration in an industry and consumer satisfaction has not yet been tested. The antitrust hypothesis suggests that monopoly/monopsony will be accompanied by allocative inefficiency, and therefore by higher levels of dissatisfaction (Fornell and Robinson). The variable *NOCHOICE* is included as a proxy for the degree of concentration with the a priori assumption that having no choice of milk handler will lower farmer satisfaction.

Among those farmers who have the ability to switch milk handlers, those who do switch (*SWITCH*) are expected to be more satisfied (Jeffrey). Misra, Carley, and Fletcher (1992a) found that farmers who remained with the same cooperative for a greater number of years (*YRSW*) showed greater levels of satisfaction. Furthermore, since satisfaction is subjective and based on expectations, farmers who have more years of experience (*EXPC*), and therefore time to adjust their expectations, are expected to have higher levels of satisfaction (Johnson and Fornell). For similar reasons, the belief by farmers that the prices they receive compare well (*PRCCOMP*) to other prices in the industry is expected to be positively correlated with satisfaction.

Several studies have investigated potential relationships between a number of variables reflecting managerial characteristics of farm enterprises and milk handler choice or evaluation. Misra, Carley, and Fletcher (1992b) found that herd size (*COWHEF*) and debt-to-asset ratio (*DETAST*) are positively related to

[1] The observations received from Florida farmers did not include information on mailbox price and deductions. Therefore, Florida farmers were not included in the study.

Table 1. Explanatory Variable Names, Definitions, and Expected Coefficients

Variable	Variable Definition	Expected Sign
Milk Handler Attributes:		
BARG	1 = bargaining-only cooperative; 0 otherwise	+
OPBAR	1 = bargaining-operating cooperative; 0 otherwise	+
INDEP	0 = independent milk handler; base variable	−
MAIL	Price farmers received after all deductions (dollars)	+
DEDUCTS	1 = chosen because of low deductions; 0 otherwise	−
ASSURED	1 = chosen because of assured market; 0 otherwise	+
FRIENDLY	1 = chosen because of friendly personnel; 0 otherwise	+
SERVICE	1 = chosen because of better services; 0 otherwise	+
Farm/Farmer Characteristics:		
NOCHOICE	1 = no milk handler to switch to; 0 otherwise	−
SWITCH	1 = switched handlers in last five years; 0 otherwise	+
PRCCOMP	1 = thinks prices compare well; 0 otherwise	+
COWHEF	Number of milking cows and heifers in herd (cows)	−
YRSW	Time spent with same handler (years)	+
EXPC	Experience as a dairy farmer (years)	+
CERTAIN	1 = sure about number of years will continue farming; 0 otherwise	+
FAMBIZ	1 = business has some form of family ownership; 0 otherwise	−
OWN	1 = farmer owns the property; 0 otherwise	−
PERIN	Percentage of family income from dairy (percent)	−
DETAST	Debt-to-asset ratio (percent)	−
Locations (states):		
AL	1 = Alabama; 0 otherwise	N.H.
AR	1 = Arkansas; 0 otherwise	N.H.
GA	1 = Georgia; 0 otherwise	N.H.
KY	1 = Kentucky; 0 otherwise	N.H.
LA	1 = Louisiana; 0 otherwise	N.H.
MS	1 = Mississippi; 0 otherwise	N.H.
NC	1 = North Carolina; 0 otherwise	N.H.
SC	1 = South Carolina; 0 otherwise	N.H.
TN	0 = Tennessee; base variable	N.H.
TX	1 = Texas; 0 otherwise	N.H.
VA	1 = Virginia; 0 otherwise	N.H.

Note: N.H. denotes no hypothesis.

farmer propensity to switch milk handlers. The current study also includes variables reflecting farmer certainty about the number of years they will continue farming (*CERTAIN*), whether or not the business has some form of family ownership (*FAMBIZ*), whether or not the farmer owns the property (*OWN*), and the percentage of family income from dairy (*PERIN*). These variables all contribute to an understanding of farmers' attitudes toward risk which may influence their levels of expectations and, consequently, satisfaction levels.

Previous studies have found some evidence of differences in milk handler performance evaluation and farmer switching rates by region and state (Boynton and Babb; Misra, Carley, and Fletcher 1992b, 1993). Misra, Carley, and Fletcher (1993) found that geographic lo-

cation (i.e., state) had a significant impact on a farmer's choice of milk handler. This suggests that geographic location influences the satisfaction of farmers with their milk handlers.

Analysis and Empirical Results

The estimated slope coefficients are not the marginal effects of changes in the independent variables. The marginal effects are given by the partial derivatives of the probability of each level of satisfaction with respect to the regressors. The probabilities for each level of satisfaction are as follows:

$$
\begin{aligned}
(3)\quad & \text{Prob}[u_i = 0] = \Phi(-\beta'Z), \\
& \text{Prob}[u_i = 1] = \Phi(\mu_1 - \beta'Z) - \Phi(-\beta'Z), \\
& \text{Prob}[u_i = 2] = \Phi(\mu_2 - \beta'Z) \\
& \qquad\qquad - \Phi(\mu_1 - \beta'Z), \\
& \text{Prob}[u_i = 3] = 1 - \Phi(\mu_2 - \beta'Z),
\end{aligned}
$$

where $0 < \mu_1 < \mu_2$ in order for all the probabilities to be positive, and Φ is the standard normal cumulative distribution function.

The partial derivatives for the continuous variables are calculated as follows:

$$
\begin{aligned}
(4)\quad & \frac{\partial \text{Prob}[u_i = 0]}{\partial Z} = \phi(\beta'Z)\beta, \\
& \frac{\partial \text{Prob}[u_i = 1]}{\partial Z} = [\phi(-\beta'Z) - \phi(\mu_1 - \beta'Z)]\beta, \\
& \frac{\partial \text{Prob}[u_i = 2]}{\partial Z} = [\phi(\mu_1 - \beta'Z) \\
& \qquad\qquad - \phi(\mu_2 - \beta'Z)]\beta, \\
& \frac{\partial \text{Prob}[u_i = 3]}{\partial Z} = \phi(\mu_2 - \beta'Z)\beta,
\end{aligned}
$$

where ϕ is the standard normal density function. The partial derivatives are calculated with the assumption that the mean of the error term is zero with a normalized variance of one. Elasticities of the probabilities of each satisfaction level with respect to the independent variables are calculated by multiplying the partial derivatives by a ratio of the average value of the independent variables to the average value of the probabilities of the dependent variable outcomes. This process allows for interpretation of the marginal effects in percentage terms.

Only the marginal effects of the continuous variables can be interpreted directly from the partial derivatives. Further calculation of the changes in the estimated probabilities of the outcomes is necessary for an accurate interpretation of the binary variables. The change in the estimated probabilities is determined by calculating the difference between means of the probability distributions of the outcomes when $z_{ji} = 0$, and when $z_{ji} = 1$. The value of the difference in means is the marginal change in probability of an outcome (e.g., $u_i = 2$) caused by a specific variable changing from $z_{ji} = 0$ to $z_{ji} = 1$.

A LIMDEP software package (Greene 1992) was used to run the regressions. The model was specified with 28 explanatory variables which were subdivided into seven milk handler attributes, 11 farm/farmer characteristics, and 10 states.[2] Table 2 gives the statistical results and the probability boundaries, μ_1 and μ_2, derived from the analysis.[3] A rough indicator of the goodness of fit of the ordered probit model is obtained by using maximum likelihood estimates to generate a likelihood ratio that is distributed as a chi-square. The calculated chi-square is significant at the 5% level (see table 2).

From table 2, statistical results show the variables with parameters significantly different from zero are *OPBAR, MAIL, FRIENDLY, SERVICE, NOCHOICE, SWITCH, PRCCOMP, COWHEF, YRSW, EXPC, OWN, AR, TX,* and *VA.* All are significant at the 5% level except farmers' years of experience in the dairy industry (*EXPC*) and farmer ownership of farm property (*OWN*), which are significant at the 10% level.

The statistically significant continuous variables are *MAIL, COWHEF, YRSW,* and *EXPC.* Elasticities were computed from the

[2] Tennessee was specified as the base state to avoid singularity.

[3] The probability boundaries are unknown parameters which are derived along with the estimates of the beta coefficients (Greene 1990, p. 703).

Table 2. Statistical Results

Variable	Coefficient	Std. Error
Constant	−1.2447	1.0810
Milk Handler Attributes:		
BARG	−0.1866	0.1255
OPBAR	−0.5540**	0.1178
MAIL	0.2309**	0.7099
DEDUCTS	−0.2597	0.1987
ASSURED	0.0140	0.0757
FRIENDLY	0.5752**	0.0799
SERVICE	0.3262**	0.0802
Farm/Farmer Characteristics:		
NOCHOICE	−0.3806**	0.1061
SWITCH	0.3772**	0.1071
PRCCOMP	0.3682**	0.0728
COWHEF	−0.0007**	0.0004
YRSW	0.0108**	0.0044
EXPC	0.0057*	0.0033
CERTAIN	0.0017	0.0697
FAMBIZ	−0.0691	0.1032
OWN	−0.1979*	0.1021
PERIN	0.0008	0.0023
DETAST	0.0003	0.0111
Locations (states):		
AL	−0.1273	0.2275
AR	0.7775**	0.1561
GA	0.0993	0.1881
KY	0.2292	0.1476
LA	−0.0855	0.1650
MS	0.2420	0.1812
NC	0.0314	0.1464
SC	−0.3009	0.1924
TX	0.5587**	0.1617
VA	0.5191**	0.1394
μ_1	0.8059	
μ_2	2.8372	
Log-Likelihood	−1,182.838	
Restricted Log-Likelihood	−1,342.631	
Chi-Square (28 df)	319.5847**	

Note: Single and double asterisks (*) denote significantly different from zero at the 10% and 5% levels, respectively.

partial derivative equations for the continuous variables (table 3). The changes in the estimated probabilities due to changes in the binary explanatory variables were obtained from further calculations on the initial parameters of the binary explanatory variables. As seen in table 3, the significant binary variables are *OPBAR, FRIENDLY, SERVICE, NOCHOICE, SWITCH, PRCCOMP, OWN, AR, TX,* and *VA.*

The elasticities and marginal probability effects for the respective variable categories sum to zero, to account for relative changes in the probability distribution of the outcomes. The signs indicate whether the change is an increase or decrease in the probability of an outcome. The complete assessment of probabilities of all possible outcomes facilitates comparison of the effects of the variables on the probability of a farmer declaring a specific level of satisfaction or dissatisfaction.

Milk Handler Attributes

The results from this analysis indicate that bargaining-operating cooperatives (*OPBAR*) are associated with greater dissatisfaction among their supplying farmers than are independent milk handlers, the omitted base binary variable (table 2). Affiliation with bargaining-operating cooperatives decreased the probability of farmers being very satisfied by 0.15 and increased the probability of farmers being very dissatisfied, dissatisfied, and satisfied by 0.03, 0.08, and 0.04, respectively (table 3). This finding indicates that farmers selling to independent handlers have a higher overall satisfaction beyond that due to the other variables in the model. This heightened level of satisfaction is also found in the case of bargaining-only cooperatives, as discussed next.

The coefficient for bargaining-operating cooperatives is significantly negative, which contrasts with the statistically insignificant effect of bargaining-only cooperatives (*BARG*) on satisfaction. This indicates that farmers receive similar levels of satisfaction from bargaining-only cooperatives and independent milk handlers, and suggests that the processing component of a bargaining-operating cooperative is viewed negatively by farmers. This may be due to the perception by farmers that the processing component of the cooperative reduces the price and/or services provided by the cooperative to the farmer.

The positive and significant effects of mailbox price (*MAIL*), friendly personnel (*FRIEND-*

Table 3. Elasticities and Marginal Probabilities of Outcomes for the Significant Explanatory Variables

Variable	Very Dissatisfied	Dissatisfied	Satisfied	Very Satisfied
Continuous Variables (elasticities):	----------	Percent	----------	
Milk Handler Attribute:				
MAIL	−0.17547	−0.34529	−0.39708	0.91784
Farm/Farmer Characteristics:				
COWHEF	0.00423	0.00833	0.00958	−0.02213
YRSW	−0.00760	−0.01495	−0.01720	0.03975
EXPC	−0.00689	−0.01355	−0.01559	0.03603
Binary Variables (discrete change between $Z = 0$ and $Z = 1$):	----------	Probability	----------	
Milk Handler Attributes:				
OPBAR	0.03175	0.07809	0.04325	−0.15291
FRIENDLY	−0.03000	−0.07806	0.05806	0.16611
SERVICE	−0.01901	−0.04712	−0.02277	0.08883
Farm/Farmer Characteristics:				
NOCHOICE	0.03169	0.06286	−0.00777	−0.08673
SWITCH	−0.01899	−0.05067	−0.03902	0.10853
PRCCOMP	−0.02277	−0.05486	−0.02089	0.09863
OWN	0.01113	0.02844	0.01519	−0.05476
Locations (states):				
AR	−0.02895	−0.08769	−0.13576	0.25238
TX	−0.02370	−0.06957	−0.08288	0.17634
VA	−0.02383	−0.06711	−0.06712	0.15818

LY), and better services (*SERVICE*) are contrasted against insignificant effects of low deductions (*DEDUCTS*) and assured markets (*ASSURED*) on farmer satisfaction (table 2). A 1% increase in mailbox price is associated with a 0.92% increase in the probability of farmers responding they are very satisfied, and with 0.18%, 0.35%, and 0.40% decreases in the probability of farmers being very dissatisfied, dissatisfied, or satisfied, respectively. Choice of milk handler because of friendly personnel and better services is reflected in increases of 0.17 and 0.09, respectively, in the probability of farmers reporting being very satisfied, and equivalent decreases when the other three satisfaction categories are added together (table 3).

Farm/Farmer Characteristics

As seen from table 3, farmers who had no choice of milk handler (*NOCHOICE*) are shown to be less satisfied with their handlers than those farmers who had a choice. Farmers who had no choice showed decreases in their probability of reporting being very satisfied or satisfied of 0.09 and 0.01, respectively, while increases occurred in the categories of very dissatisfied and dissatisfied. In contrast, farmers who had switched handlers within the previous five years (*SWITCH*) had an increased probability of being very satisfied of 0.11, and a decreased probability of being less than very satisfied of 0.11. Farmers' perceptions of the comparability of their milk prices to those received by other farmers (*PRCCOMP*) were also positively associated with satisfaction levels, increasing the probability of these farmers being very satisfied by 0.10, and decreasing the probability of their being less than very satisfied by 0.10. Finally, farmers who owned their own farms (*OWN*) reported relatively low levels of satisfaction overall, with property ownership decreasing the probability of a

response of very satisfied by 0.05, and increasing the probability of reporting very dissatisfied, dissatisfied, or satisfied by 0.01, 0.03, and 0.02, respectively.

A 1% increase in the number of milking cows and heifers in the herd (*COWHEF*) was associated with a 0.02% decrease in the probability of farmers being very satisfied, and a 0.02% increase in the probability of being less than very satisfied. The number of years a farmer spent with the same milk handler (*YRSW*) had the opposite effect on satisfaction, i.e., a 1% increase in the variable *YRSW* was associated with a 0.04% increase in the probability of the farmer being very satisfied and a 0.04% decrease in the probability of being less than very satisfied. Farmer experience (*EXPC*) had a similar relationship with satisfaction, with a 0.04% marginal probability of reporting being very satisfied (table 3).

Location

Farms in the majority of states did not have a significant difference in farmer satisfaction levels compared to farmers in Tennessee, the omitted binary variable; however, farmers in Arkansas, Texas, and Virginia had increased probabilities of 0.25, 0.18, and 0.16, respectively, of being very satisfied compared to farmers in Tennessee and other states (table 3). The probabilities of being less than very satisfied decreased by the same amounts.

Summary, Conclusions, and Implications

Recent structural changes in the southeastern dairy industry have called into question dairy farmers' choices among and satisfaction with their milk handlers. An ordered probit model was used to determine the effect of milk handler attributes, farm/farmer characteristics, and location on the post-choice satisfaction levels of southeastern U.S. dairy farmers. As expected, mailbox price, friendly personnel, and high-quality service had significant, positive effects on farmer satisfaction. Bargaining-operating cooperatives were associated with low farmer satisfaction levels compared to proprietary firms and bargaining-only cooperatives. Choice among milk handlers, having switched handlers, number of years with the same handler, and farmer experience were all positively correlated with farmer satisfaction. In contrast, farmers with large herds and those who owned their property tended to be less satisfied. Finally, farmers in Arkansas, Texas, and Virginia were more satisfied with their milk handlers than those in the other states.

The results support the conclusion that price and quality of the services that farmers receive from their milk handlers have the greatest effect in raising farmer satisfaction. Secondly, bargaining-operating cooperatives tend to be associated with lower levels of satisfaction than both independent milk handlers and bargaining-only cooperatives. Competition is important, too, with farmers who are able to choose and who do switch milk handlers showing higher levels of satisfaction. Experienced farmers and those who have stayed with the same milk handler longer are also more likely to be more satisfied. Finally, farmers who own their property and those with larger herds appear not to be served well, or not to have their expectations met by their milk handlers.

The most important contribution of this study to recent research on the structural changes in the dairy industry is the inclusion of independent milk handlers. The results suggest that the difference in satisfaction with different types of milk handler organizations does not fall along cooperative-proprietary firm lines. The negative relationship between bargaining-operating cooperatives and satisfaction is striking and suggests that this organizational structure may need to be reconsidered. Further research to determine whether this is due to differences in farmer perceptions of the marketing effectiveness between the two types of cooperatives might suggest whether diversification of scope reduces cooperatives' abilities to meet member needs and expectations.

The findings also indicate that the recent changes in the industry are positive and are likely to be the result of farmers making informed, successful searches for greater satisfaction. The fact that farmers in Arkansas,

Texas, and Virginia are more satisfied than those in other states points to some differences in factors that might vary with political boundaries. These may include differences in regulations affecting the industry and success of extension efforts or the like, and may require further investigation.

The negative relationships between satisfaction and property ownership and herd size beg further research. The results appear to point to a relationship between some managerial and financial characteristics of farm and farmer and satisfaction levels, though the precise mechanism determining the relationship is difficult to clearly identify. This finding may reflect milk handler failure to deal appropriately with the special needs of large-scale suppliers. Alternatively, both herd size and ownership of farm property may be reflecting higher farmer expectations given the greater risks involved in managing a large operation or given higher expected returns to earned assets.

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