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Michigan State University Agricultural Experiment Station and Cooperative Extension Service

Research Report

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Issued June 1980

20 pages

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# RESEARCH REPORT 393

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## Relationships between Cooperatives and Proprietary Handlers in U.S. Grade A Milk Markets



Photo courtesy of Michigan Milk Producers Association



# Relationships between Cooperatives and Proprietary Handlers in U.S. Grade A Milk Markets

By Robert D. Boynton and Glynn McBride<sup>1</sup>

Cooperatives and proprietary handlers<sup>2</sup> play a vital role in United States Grade A milk markets. Dairy cooperatives are the first handler of about three-quarters of farm production. Increasingly, these cooperatives are also engaging in manufacturing, processing and distributing milk and other dairy products. Despite cooperative integration and growth, proprietary handlers still process and distribute at least three-quarters of the fluid and soft products sold in the United States.

This report is based on research studying the relationship between cooperatives and proprietary handlers in the dairy subsector.<sup>3</sup> It was hypothesized that the type and quality of cooperative and proprietary handler exchange relationships affect the degree to which the subsector is coordinated as well as the nature of the coordination process.

This report summarizes the finding of the research, and is meant to be of particular interest to dairy cooperatives and proprietary handlers as well as those making or studying subsector policy. The methodology will be outlined first to provide a basis for the information subsequently reported. Data collected on the size, scope, and nature of the Grade A operations of U.S. dairy cooperatives and proprietary handlers will be presented. The types of procurement relationships will be discussed, including treatment of supply contracts.

Following this section, the cooperative-proprietary handler relationship will be examined in a more detailed manner. The degree of understanding each has of the other as well as barriers to a harmonious relationship will be carefully analyzed. Following this, the attitudes of both participants toward procurement services provided by cooperatives will be studied. Finally, an overall examination of the competitiveness of procurement markets will be presented.

## RESEARCH PROCEDURE<sup>4</sup>

Data were collected from U.S. dairy cooperatives and proprietary handlers by questionnaires and personal interviews. Lengthy questionnaires were sent on a random basis to approximately half of U.S. dairy cooperatives and proprietary handlers marketing Grade A milk. All sizes of operation and regions of the country were represented. Over 40 percent of the 159 cooperative and 187 proprietary handler mail surveys were completed and returned. Similar questionnaires were sent to the two groups. Approximately 80 percent of the questions on the two surveys were identical or the mirror-image of each other. This allowed for comparisons of the activities, attitudes and perceptions of the two groups. Questions covered these areas:

1. Milk marketing activities engaged in and the size of various operations
2. The competitiveness of procurement markets
3. Pricing behavior
4. Bulk milk supply arrangements
5. Attitudes of cooperatives and proprietary handlers toward each other; degree of understanding of the needs and concerns of one group by the other
6. Procurement services
7. Attitudes on certain types of marketing behavior.

In addition to the mail questionnaires, extensive personal interviews were conducted with nearly 50 managers of cooperative and proprietary firms across the U.S. They covered many of the same topics addressed by the questionnaires but in a more comprehensive and open-ended manner. In general, the larger cooperatives and proprietary handlers were selected for interviews, but all regions of the country were represented.

## COOPERATIVES, PROPRIETARY HANDLERS AND THEIR PROCUREMENT RELATIONSHIPS

Cooperatives were identified by size, location, and type of cooperative. Proprietary handlers were categorized by size and location.

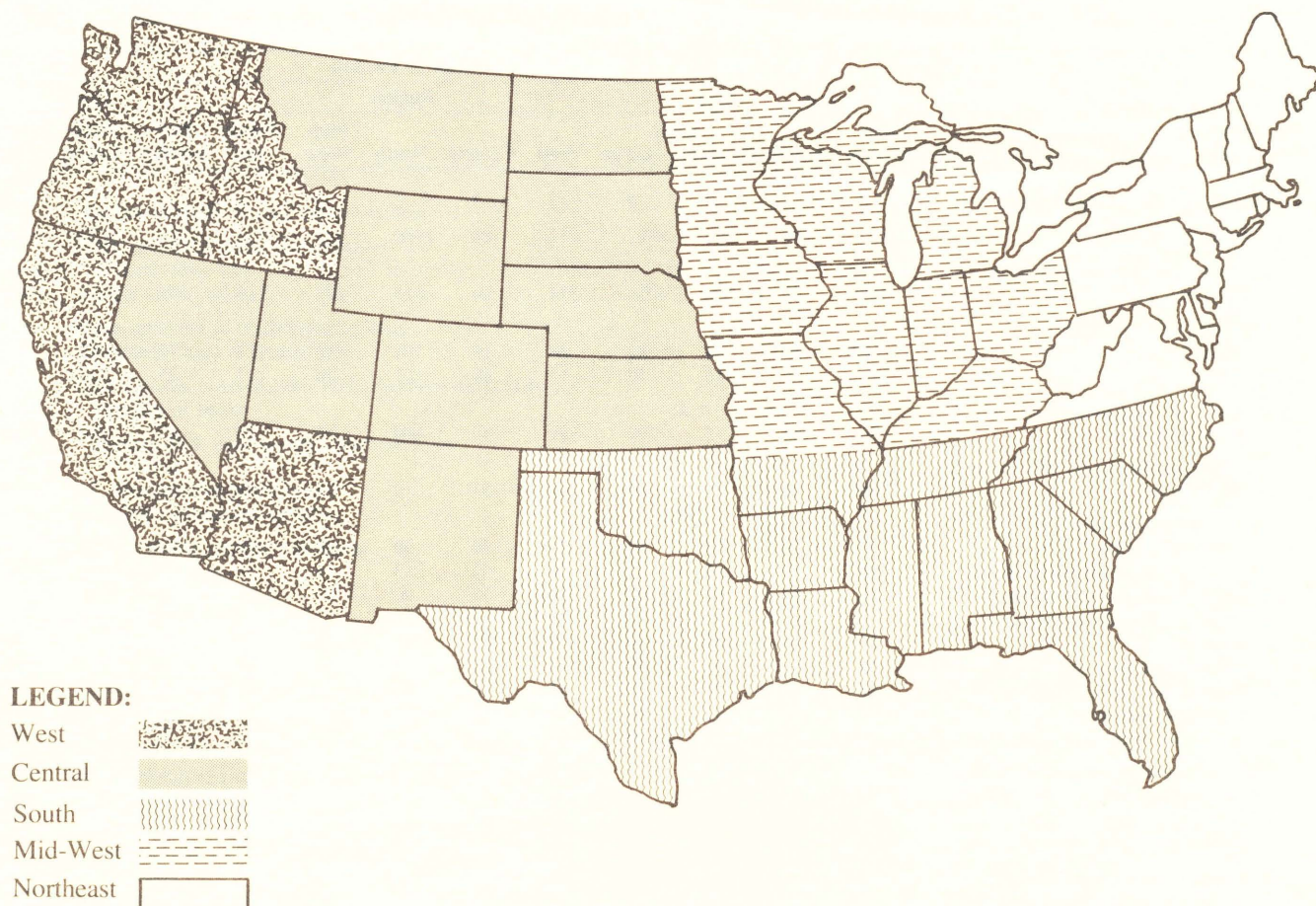
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<sup>2</sup> The term "proprietary handler" includes both independent processors of fluid and soft products as well as food chains who operate processing plants. It does not include cooperative processors.

<sup>3</sup> The dairy subsector includes the individuals and firms engaged in milk production, hauling, manufacturing/processing, distribution and retailing as well as the suppliers of needed inputs.

<sup>4</sup> The author gratefully acknowledges the outstanding cooperation given by the dairy cooperatives and proprietary handlers throughout the U.S. who completed questionnaires and gave of their time for interviews. Such cooperation was essential to the success of this project.





**Fig. 1. Regional designations used in stratifying samples and reporting data from cooperative and proprietary handler questionnaires.**

Cooperative size was designated as follows:

small co-op	less than 500 members
medium co-op	500-4,999 members
large co-op	more than 5,000 members

Cooperatives were located in one of five regions based on the address of their main office. Figure 1 displays the five regions of the U.S. used in this study.

Three types of dairy cooperatives were identified—bargaining, marketing and operating. A bargaining cooperative markets its members' milk but usually has no facilities for storage, manufacturing or processing.<sup>5</sup> A marketing cooperative has such facilities but it does not operate them as a primary business activity. Instead, a marketing cooperative uses the facilities to increase its members' bargaining strength and handle excess Grade A production. In this study, a cooperative was classified as a marketing type if it

processed no more than 10 percent and manufactured

no more than 40 percent of its received volume annually, and processed and manufactured (combined) no more than 40 percent of its annual volume, but had facilities for processing and/or manufacturing.

An operating cooperative differs from a marketing cooperative by operating processing and/or manufacturing facilities as a primary business activity. It was so classified in this study if it

processed more than 10 percent or manufactured more than 40 percent of its annual received volume or processed and manufactured (combined) more than 40 percent of its annual volume.

Proprietary handlers were divided into two size groups. Large handlers had two or more plant locations and small handlers had only one location.<sup>6</sup> Proprietary handlers were also identified with one of the five regions of the U.S. shown in Fig. 1.

<sup>5</sup> Manufacturing is defined as the conversion of Grade A or B milk to hard dairy products such as butter, powder and cheese. Processing is the conversion of Grade A milk to fluid or soft dairy products.

<sup>6</sup> This size classification was the only one possible when the samples were drawn and in the interest of consistency was maintained.



**Table 1a. Dairy cooperative operations reported by size, region and type of co-op, 1976-77.<sup>(a)</sup>**

	Total Population	Mean or Percent										
		Size			Region					Type		
		Small	Medium	Large	West	Central	South	Mid- West	North- east	Bar- gaining	Mar- keting	Oper- ating
* † No. of states in marketing area	3	2	4	9	2	3	2	2	4	3	7	5
* ‡ † Number of members	652	184	994	8597	211	308	1180	723	533	1014	6230	1828
* ‡ † Volume received from members, 1976 (mil. lbs.)	304	73	506	4071	374	64	515	293	228	512	2844	915
Received volume which was:												
* ‡ Grade A (%)	60	54	84	82	88	10	100	50	77	75	75	81
* ‡ Grade B (%)	40	46	16	18	12	90	<1	50	23	25	25	19
‡ Percent operating under 1 or more federal orders	84	86	73	100	37	57	100	98	86	87	84	74
‡ Percent operating under 1 or more state orders	40	38	43	60	59	51	0	28	53	59	54	48
Percent of co-ops which:												
* ‡ Sell farm supplies	73	76	53	80	54	94	90	88	39	54	84	49
Own equip. for off-farm hauling	56	57	50	70	54	97	13	54	51	43	66	47
* ‡ † Contract for off-farm hauling	64	57	87	100	63	14	90	83	42	64	100	95
‡ Own receiving &/or pumpover stations	49	48	50	70	9	11	90	47	74	33	77	53
* † Manufacture hard products	30	19	67	90	34	11	3	30	37	0	84	91
* † Process fluid &/or soft products	23	14	50	80	54	8	3	11	37	0	62	69
* ‡ † Distribute products	33	29	47	60	54	8	3	43	16	0	50	64
* † Own retail outlets or routes	16	10	37	50	46	8	3	11	16	0	23	53
For those co-ops which manufacture:												
* † Percent of total received volume manufactured	13	8	35	24	16	5	1	15	14	0	12	49
Percent packaged under pvt. label	48	55	20	28	33	3	90	62	40	0	25	21
For those co-ops which process:												
* † Percent of total received volume processed	10	9	15	9	37	3	<1	3	16	0	3	21
Percent packaged under pvt. label	56	60	45	35	63	37	1	38	53	0	30	45

(a) \*, ‡, † indicate significance at the 10 percent level for size, region and cooperative type, respectively. In each case, the null hypothesis is that the mean of all sub-samples and the total sample are equal. Ratio scale variables were tested with an F test (ANOVA). A chi-square test was employed for non-ratio scale variables.

### Cooperative and Proprietary Handler Operations

Tables 1a and 1b provide information on the nature of dairy cooperative and proprietary handler operations. Data are summarized for the total population, by size and regional groupings and, for cooperatives, by type.

Several general observations can be made about dairy cooperatives. They are large organizations in terms of the size of their marketing area, number of members and volume of milk handled. They handle a significant Grade B component but this varies considerably across the country. Many are diverse organizations which have vertically integrated to the retail level. A major part of their manufacturing and processing is done under private label.

Some insights are obtained when data are broken down by size, region and type of cooperative. Large differences in number of states, membership and volume between the size groups were noted. West and Central cooperatives are smaller than the other three regions in terms of membership. Although Central cooperatives have larger membership than Western associations, the large farms and high output per

cow in the West give those cooperatives more volume. Marketing cooperatives are by far the largest type of cooperative association.

Small cooperatives have proportionally more Grade B production than larger cooperatives. The high percentages of manufacturing grade milk in Midwest and Central cooperatives reflect the concentration of Grade B production in the upper Midwest and Iowa, Montana and South Dakota. Interestingly, little difference in the Grade A-B ratio is observed among the various types of cooperatives.

The percentage of cooperatives engaged in various subsector activities is fairly constant across size, region and type categories but some variation is noted. All large cooperatives find it necessary to contract for at least some of their off-farm hauling since their volume makes ownership of capacity sufficient to transport their total volume infeasible. The same is true for marketing cooperatives.

Although size is not a necessary condition for cooperative vertical integration, as data in Table 1a demonstrate, this tendency increases as the cooperative grows. Southern



**Table 1b. Manufacturing and processing activities of proprietary handlers, by size and region of proprietary handler, 1976-77.**<sup>(a)</sup>

		Mean or Percent						
		Size		Region				
	Total Population	Small	Large	West	Central	South	Mid-West	North-east
* Number of states in total marketing area	3	2	8	3	5	3	2	4
Firms operating under one or more:								
* ‡ Federal order (%)	83	86	65	37	85	82	100	83
* ‡ State order (%)	22	18	46	66	26	18	2	28
‡ Firms involved in manufacturing dairy products (hard & frozen) (%)	52	50	67	83	49	33	51	58
FOR THOSE HANDLERS WHO MANUFACTURE:								
* Number of plants	2	1	5	3	1	2	2	1
Percent milk used in mfg. procured from:								
Co-ops	67	69	55	48	94	94	70	58
Independent producers	28	26	36	50	3	6	24	35
Other processors or mfrs.	5	5	9	2	3	0	6	7
Percent mfg. output which was:								
* Hard cheese	9	7	25	1	23	<1	16	8
‡ NFDM powder	1	1	5	5	0	0	0	<1
Butter	3	3	3	8	0	0	0	8
Ice cream	79	81	65	72	77	99	84	61
Other	8	8	2	14	0	0	0	23
Percent packaged under private label	24	25	20	13	42	8	37	17
Firms involved in processing fluid & soft dairy products (%)	100	100	96	100	100	100	98	100
FOR THOSE HANDLERS WHO PROCESS:								
* Number of plants	2	1	4	3	2	2	1	1
Volume of milk used in proc. in 1976 (mil. lbs.)	240	207	447	332	65	621	117	67
Percent milk used in proc. procured from:								
Co-ops	71	71	72	60	74	77	77	63
Independent producers	26	26	25	40	25	23	17	32
Other processors or mfrs.	3	3	3	0	1	0	6	5
Percent packaged under private label	21	20	26	12	27	19	21	21
Percent of proc. products distributed by p. handler	80	79	85	89	85	85	71	78
‡ Firms operating retail routes or owning retail outlets (%)	68	70	56	60	89	44	63	89

(a) \* and ‡ indicate significance at the 10 percent level for size and region, respectively. In each case, the null hypothesis is that the mean of all sub-samples and the total sample are equal. Ratio scale variables were tested with an F test (ANOVA). A chi-square test was employed for non-ratio scale variables.

cooperatives are less integrated, at least in part due to lack of an adequate year-round regional supply.

A significant number of proprietary handlers manufacture some dairy products in addition to their bottling activities (Table 1b). The major item in the manufacturing product category is ice cream. Two-thirds of the milk used in manufacturing by a proprietary firm is procured from cooperatives. This percentage, however, differs across the country. In the West, for example, this percentage is 48 percent with 50 percent being acquired from independent producers and 2 percent from other firms. Contrast this situation to the Central or Southern regions where 94 percent of the milk is procured from cooperatives. In the processing of fluid dairy products nearly three-quarters of the milk is procured from cooperatives. This figure is fairly constant across regions. Data show that 80 percent of processed products are distributed by the proprietary handler. In addition 68 percent of the proprietary firms operate some home delivery routes or own retail outlets.

### Procurement Relationships

The nature of the procurement relationships existing between dairy cooperatives and proprietary handlers has a major effect on the smooth operation of the marketing function. Tables 2a and 2b provide some information on these relationships. Information was obtained on the selling alternatives available to dairy cooperatives and their use of them (Table 2a). Cooperatives indicated 30 possible buyers of their bulk milk among the proprietary handler population. They sold milk to roughly one-fourth of this group.

It is important to recognize here that the respondent cooperative was asked to indicate how many possible and actual buyers of milk they had in their market. As cooperatives get larger they have more possible buyers. If it can be assumed that the smallest cooperative defines the minimum market size then a small cooperative or a larger cooperative operating in a reduced geographical market has roughly 26 possible buyers and sells to less than 20 percent of them.



**Table 2a. Cooperative procurement relationships with proprietary handlers by size, region, and type of co-op, 1976-77.** <sup>(a)</sup>

		Mean or Percent											
		Total Population	Size			Region				Type			
			Small	Medium	Large	West	Central	South	Mid- West	North- east	Bar- gaining	Mar- keting	Oper- ating
* †	No. possible buyers of bulk milk	30	26	22	133	16	6	24	11	58	25	103	33
* ‡ †	No. buyers co-op sells to	8	5	8	79	6	2	14	5	12	14	69	12
	No. of co-ops each co-op competes with	10	9	9	36	3	3	6	10	14	7	13	17
†	Customers buying under full supply arrangement(b) (%)	47	52	26	40	74	88	67	5	48	61	38	17
	Percent of co-ops having 1 or more full supply arrangements which are:												
	Formal-written	44	40	55	87	89	14	10	60	49	63	87	55
*	Informal-verbal	61	60	64	62	11	86	100	73	54	42	52	73
†	Volume of co-op milk committed under full supply arrangements(b) (%)	41	45	24	36	72	88	68	5	32	66	40	11

(a) \*, ‡, † indicate significance at the 10 percent level for size, region and cooperative type, respectively. In each case, the null hypothesis is that the mean of all sub-samples and the total sample are equal. Ratio scale variables were tested with an F test (ANOVA). A chi-square test was employed for non-ratio scale variables.

(b) Written or verbal.

**Table 2b. Proprietary handler procurement relationships with cooperatives by size and region of proprietary handler, 1976-77.** <sup>(a)</sup>

		Total Population	Size		Region				
			Small	Large	West	Central	South	Mid- West	North- east
‡	P. handlers who buy from a co-op(s) (%)	88	88	88	83	78	93	94	83
	Percent of usage purchased from co-op(s):								
	Manufacturing uses (hard products)	67	69	55	48	94	94	70	58
	Processing uses (fluid & soft products)	71	71	72	60	74	77	77	63
	Percent of p. handlers paying premium prices for at least some of their supply	70	71	63	6	74	62	100	65
	No. of co-ops selling bulk milk in p. handler's marketing area	3	2	4	4	2	2	3	3
	Percent of p. handlers buying under a full supply arrangement with co-op (b)	44	43	52	48	33	30	56	53
	Percent of full supply arrangements which are:								
	Formal-written	60	62	50	58	60	100	29	55
	Informal-verbal	40	38	50	42	40	0	71	45
	Length of time p. handler had a full supply arrangement (yrs.)	12	13	10	20	16	8	15	7

(a) \* and ‡ indicate significance at the 10 percent level for size and region, respectively. In each case, the null hypothesis is that the mean of all sub-samples and the total sample are equal. Ratio scale variables were tested with an F test (ANOVA). A chi-square test was employed for non-ratio scale variables.

(b) Written or verbal.

When cooperatives were asked the number of cooperatives they compete with, large cooperatives—again because of their larger market area—indicated 36, while smaller cooperatives and medium size cooperatives indicated only nine. The data suggest that for the minimum size market, approximately nine cooperative competitors exist.

The number of cooperatives each cooperative believes it

competes with is a measure of seller concentration and the competitive discipline imposed by other bulk milk sellers on the responding cooperative. This is why this particular measure is considered important. Interestingly, the three types of cooperatives reported different numbers of competing cooperatives. A bargaining cooperative is specialized in selling bulk milk and therefore has limited marketing



flexibility. Because of its more restricted nature it may perceive fewer competitors than either of the other types. The small size of most bargaining cooperatives may also help to explain this situation. Operating cooperatives, on the other hand, are more diversified and may view all types of cooperatives in their market as competitors.

Bargaining cooperatives indicated they have fewer potential customers than either of the other two types. This is probably explained by the inability of bargaining cooperatives to provide the full complement of services or volumes as large as other types of cooperatives. The large number of marketing cooperative customers may be due to the large volumes handled by these cooperatives.

Cooperatives indicated that 47 percent of their proprietary handler customers purchased bulk milk under some type of full supply arrangement.<sup>7</sup> Small cooperatives and bargaining cooperatives tend to have a higher percentage of their customers purchasing milk under full supply arrangements. This can be explained by their reduced flexibility and the necessity to reduce their uncertainty. Informal or verbal full supply arrangements are used most frequently (Table 2a). It should be pointed out that the figures on formal and informal full supply arrangements do not indicate the number of such arrangements—only the percentage of cooperatives who have one or more of these types. If a cooperative had both types of arrangements, the survey instrument did not detect the relative importance of each type within the cooperative.

In the West more cooperatives use formal contracts than informal contracts but in the South, the situation is reversed. The average cooperative had 41 percent of its annual volume committed under some type of full supply arrangement. Once again small and bargaining cooperatives had a larger percentage of their milk committed than did larger cooperatives and marketing and operating cooperatives. This is primarily a reflection of the lower volumes of milk handled by bargaining and small cooperatives. Notice the small percentage of milk committed under full supply arrangements by the average Midwestern cooperative and the large percentage committed by Western, Central and Southern associations.

Almost 90 percent of all proprietary handlers purchase some milk from one or more cooperatives. This figure is fairly constant across size and regional classifications as seen in Table 2b. Nearly three-quarters of the proprietary handlers pay premium prices above the federal order Class I minimum for at least some of their Grade A supply. This figure is also fairly constant across the two size categories but it does differ across regions. In the West only 6 percent of the proprietary handlers pay over-order prices.

Proprietary handlers were asked to estimate the number

of cooperatives that sold bulk milk in their marketing area. The figures are quite stable for all categories and are relatively low. Proprietary handlers indicated an average of three potential cooperative suppliers of bulk milk. These figures, of course, do not represent all of the alternatives open to a proprietary handler since independent producers and other proprietary firms may also provide bulk milk.

### Supply Arrangements

Supply contracts are important components of exchange in the dairy subsector. For purposes of this discussion, the term "supply contract" will be used to describe any written arrangement for the sale of bulk Grade A milk between a cooperative and proprietary handler, signed by representatives of both parties. All verbal understandings will be called supply agreements. If the contract or agreement is for all the Grade A milk needed by a proprietary handler it will be designated as full supply, otherwise the term partial will be used. Supply arrangement is the collective term for all the above types.

Forty-four percent of proprietary handlers indicated they purchased milk under some type of full supply arrangement. This figure was fairly constant across size groups and did not vary appreciably by region. (Table 2b). The written or formal type of arrangement is used by 60 percent of the proprietary handlers who have entered into a full supply arrangement. The remaining handlers use the informal or verbal type. Among the larger proprietary handlers there appears to be little distinction made between the two types of arrangements. In the Midwest the informal type is preferred by a large margin while in the South the reverse is true. It is interesting to note that on the average, full supply arrangements have been maintained between proprietary handlers and cooperatives for periods in excess of 10 years.

**Full and Partial Supply Arrangements.** Proprietary handlers prefer a full supply arrangement when supplies are short or are expected to be. Cooperatives, on the other hand, prefer them under the opposite conditions. They prefer flexibility when supplies are tight and supply commitment when quantities are abundant. These simple rules explain much of the behavior toward full supply arrangements shown by these two groups.

There are several factors favoring full or partial supply arrangements. Cooperatives prefer full supply arrangements because the uncertainty associated with ensuring a market for their members' milk is reduced and their planning is facilitated. These full supply arrangements also ensure that the cooperative does not do more than its share of supply balancing and disposal.<sup>8</sup> Full supply arrangements also

<sup>7</sup> A full supply arrangement provides for the provision of all (with a few minor exceptions) the bulk Grade A milk needs of a proprietary handler by a dairy farmer cooperative. The arrangement may be written or verbal.

<sup>8</sup> Of course, no automatic guarantee of adequate compensation for these services is provided by a full supply arrangement. Competitive conditions in the local market, the cooperative's bargaining strength and the reasonableness of the proprietary handler combine to determine the payment of compensation for all services rendered.



confer some additional market power on cooperatives because of buyer reliance on them and the portion of the market they foreclose to other suppliers.

Almost all food chain handlers and proprietary handlers without experience in milk procurement prefer to turn the entire job over to one supplier who is responsible for all bulk supply matters including balancing, disposal, hauling and quality. Several proprietary handlers indicated that transaction costs were significantly reduced when only one supplier was involved. Quality was more easily monitored, problems corrected and overall coordination improved. Proprietary handlers feel cooperatives have more to gain from full supply arrangements. Cooperatives do not disagree with this assessment.

Despite the advantage which cooperatives are credited with under full supply arrangements, proprietary handlers were well satisfied with the cooperative's performance under them. In response to survey questions, 60 percent of those proprietary handlers purchasing their bulk milk needs under a full supply arrangement indicated greater satisfaction than before such an arrangement existed. In addition, 95 percent of those buyers indicated satisfaction with their full supply arrangement—59 percent reported general satisfaction and 36 percent found them totally satisfactory.

The contention that proprietary handlers may be coerced into accepting full supply arrangements is not supported by data from this research. The surveys provided an opportunity for proprietary handlers to indicate that they entered into their arrangements out of fear of recriminations by the cooperative. Virtually none did. It also provided handlers the opportunity to indicate that in order to receive procurement services it was necessary to accept a full supply arrangement. This is not borne out. In the case of the 10 handler services studied in this research, no more than 13 percent of the responding cooperatives indicated that any particular service was available only to those customers with a full supply arrangement.

Some cooperatives and proprietary handlers noticed some difference in the treatment afforded a full supply buyer over a partial supply customer. For the full supply customer quality problems were corrected more quickly with no opportunity for the responsibility to be passed to another supplier. Some buyers and sellers said that it was reasonable to expect the full supply customer to get preferential treatment in times of short supply. No full supply customer indicated hesitancy by the cooperative to correct problems with the bulk milk supply. Despite some inherent disincentive to quickly redress buyers' concerns under full supply arrangements, cooperative performance is assured by competition for buyers among cooperatives and relatively quick and easy termination of such arrangements.

**Written and Verbal Supply Arrangements.** Several conditions favoring the use of written or verbal supply arrangements can be identified. Early in the sales relationship both parties may prefer a contract until—and if—

mutual trust develops and standard operating procedures are well established. Another factor favoring the written contract is the need to increase the security of a capital investment. Often when either party plans a major capital expenditure with outside financing, a supply contract is required by the lender to increase the security of the loan.

The process of negotiating a supply contract conveys more information than the establishment of a verbal agreement in most cases. Both parties are required to consider contingencies and assign responsibilities and rights under the contract. If damages can be established in the contract for breaches by either party, transaction costs can be greatly reduced in the event of a breach.

In the West, cooperatives have considerably less market power arising from their lack of supply control. Discussions with these cooperatives indicated that, in general, contracts were less comprehensive and detailed than in other regions of the country. The reason for this given by cooperative management was that selling markets are so competitive that they have no room for bargaining. This suggests that in the absence of significant cooperative power, terms of contracts are likely to be sketchy and assign more responsibility and/or fewer rights to cooperatives than to proprietary handlers.

Several conditions favor the use of the verbal contract. As a result of recent Justice Department and Federal Trade Commission interest in the operations of dairy cooperatives and the use of supply contracts, many cooperatives are not willing to enter into written arrangements. The consensus among cooperatives interviewed was a contract was only as good as the parties responsible for maintaining the sales relationship. For this reason several cooperatives and proprietary handlers could see no benefit from a written arrangement. A few cooperatives have decided that a contract which holds them to a fixed supply, regardless of the cost of furnishing that supply, is not worth the stability and certainty that it provides. In the face of free riders and growing reserve and surplus disposal costs, these cooperatives find it unprofitable to serve some buyers. By using a verbal agreement the cooperative can establish reasonable service charges and proprietary handlers can or cannot buy as they choose. If they buy from the cooperatives they are expected to pay the established fees. This approach works most effectively for the marketing or operating cooperative which has adequate manufacturing or processing facilities.

#### **Degree of Understanding That Exists between Cooperatives and Proprietary Handlers**

If bargained exchange is going to be most effective it is important that the two exchange parties understand each other and appreciate the limitations or constraints on the behavior of the other participant. Such understanding can prevent adoption of unreasonable positions by one party and promote coordinated markets. For these reasons it was considered important to get information from proprietary



handlers and cooperatives about their degree of understanding of the motivations of and constraints on the market participant with whom they bargain.

Both cooperatives and proprietary handlers were asked to select those characteristics of bulk milk customers most important to cooperatives (Table 3). Cooperatives overwhelmingly indicated that a reliable, stable, solvent business was the most important characteristic for a proprietary handler customer to have. The second most important characteristic noted by cooperatives was the desire to have a customer who was easy to talk with and willing to share information in order to improve the efficiency of the marketing system.

It is informative to compare the responses of cooperatives with those of proprietary handlers who were asked to indicate what they thought cooperatives desired from them. Seventy-two percent of the proprietary handlers indicated that a reliable, stable, and solvent handler was an important characteristic to cooperatives and 51 percent of the proprietary handlers indicated that they thought it was the most important characteristic. It appears that proprietary handlers overestimated the importance of buying large volumes of milk and desiring a full supply arrangement (Table 3). At the same time they appear to have underestimated the importance assigned to the ease of communication between seller and buyer. Responses of the two groups were significantly different at the 10 percent level for most choices as well as for the selection of the most important characteristic.

In order to get the other side of this issue a similar question was asked of proprietary handlers. They were asked what were important supply attributes from their point of view. In Table 4 it is seen that proprietary handlers indicated that the assurance of a top quality milk supply was the most important characteristic. They also indicated that a competitive price was very important. While not considered to be the most important supply attribute by many proprietary handlers, a fairly high percentage indicated that having supplies available on request and a steady flow of milk to their plant were important. Although 78 percent of the cooperatives indicated that a high quality milk supply was important to proprietary handlers, only 33 percent of them believed it was the most important characteristic (Table 4). By a large margin, proprietary handlers indicated that it was the most important characteristic. It appears that cooperatives overestimated the importance of maintaining a steady flow to the buyer's plant.

Another important dimension of understanding between these two market participants relates to their pricing behavior, particularly in those markets having Class I premiums above the federal order minimum. Cooperatives and proprietary handlers were asked to indicate important factors in developing a price under bargained exchange. Factors important to cooperatives in developing price and which proprietary handlers thought were important to cooperatives are indicated in Table 5.

**Table 3. Important characteristics of bulk milk customers of cooperatives as reported by co-ops and proprietary handlers. (a)**

Characteristic	Percentage Indicating Characteristic is ...			
	Important (b)		The Most Important (†)	
	Co-ops	P. Handlers	Co-ops	P. Handlers
* A reliable stable solvent business	99	72	90	51
* Buying large volumes of milk	14	50	—	23
* Easy to talk to; willing to share information in order to improve the efficiency of the marketing system	44	15	1	5
* Desires a full supply arrangement	23	51	9	16
A weaker bargaining participant	—	6	—	5
Other	1	—	—	—
			100	100

(a) An asterisk (\*) at the left hand margin indicates cooperative-proprietary handler responses to whether a choice was important were significantly different at 10 percent level based on a chi-square test. † indicates their responses to the question of the "most important" were significantly different at the 10 percent level based on a chi-square test.

(b) Respondents could designate more than one characteristic as important.

**Table 4. Characteristics of the bulk milk supply important to proprietary handlers, as reported by cooperatives and proprietary handlers. (a)**

Characteristic	Percentage Indicating Characteristic Is ...			
	Important (b)		The Most Important (†)	
	Co-ops	P. Handlers	Co-ops	P. Handlers
* The assurance of a top quality milk supply	78	92	33	77
A competitive price(c)	—	67	—	17
* Supplies available on request	33	46	9	5
A steady flow to our plant	84	37	46	1
Not require us to deal with individual producers	25	20	10	—
Not require us to manage hauling activities	15	23	—	—
Other	2	1	2	—
			100	100

(a) An asterisk (\*) at the left hand margin indicates cooperative-proprietary handler responses to whether a choice was important were significantly different at 10 percent level based on a chi-square test. † indicates that their responses to the question on the "most important" were significantly different at the 10 percent level based on a chi-square test.

(b) Respondents could designate more than one characteristic as important.

(c) This choice was inadvertently omitted from the cooperative questionnaire. Cognizance of its importance to proprietary handlers, however, was verified in personal interviews with cooperative managers and by several indicating this under the "OTHER" option on this question.



**Table 5. Factors important to cooperatives in developing a price under bargained exchange, as reported by co-ops and proprietary handlers.<sup>(a)</sup>**

Factor	Percentage Indicating Factor Is ...			
	Important <sup>(b)</sup>		The Most Important <sup>†</sup>	
	Co-ops	P. Handlers	Co-ops	P. Handlers
What the market will bear <sup>(c)</sup>	—	68	—	48
Cost of production	24	35	1	13
Current retail sales	5	7	—	—
* The potential for milk to move in from nearby markets	65	31	59	10
Local supplies available	9	22	1	10
Co-op member preferences/expectations	4	7	1	2
Other co-op's actions	21	25	1	9
* Long term health of processors and the entire industry	36	12	3	2
* Cost of services rendered	28	22	21	5
Other	14	1	13	1
			100	100

(a) An asterisk (\*) at the left hand margin indicates cooperative-proprietary handler responses to whether a choice was important were significantly different at 10 percent level based on a chi-square test. <sup>†</sup> indicates that their responses to the question on the "most important" were significantly different at the 10 percent level based on a chi-square test.

(b) Respondents could designate more than one factor as important.

(c) This choice was not given to cooperative respondents.

Cooperatives indicated the most important factor in determining a price is the potential for milk to move in from nearby markets. The cost of services rendered is also considered to be very important in price determination. An important factor identified by cooperatives was concern for the long term health of processors and the entire industry. Proprietary handlers feel that the most important factor considered by cooperatives in developing a price is getting what the market will bear. It is reasonable to conclude that some element of "what the market will bear" is evident in the responses of cooperatives shown in the first two columns of Table 5. Some evidence of this attitude also emerged in interviews with cooperative management.

The impression should not be left that charging what the market will bear is somehow undesirable. Although it may be an indication of market power, it might also be a manifestation of the price-determining function often performed by cooperatives. If federal order minimum prices do not prevail, determining the market clearing or equilibrium price in a market is a function which must be performed by the participants and is not without costs. Perhaps determining what the market will bear is synonymous with the price discovery process. It is interesting that proprietary handlers did not assign as much importance to the long term health of

processors and the entire industry as did cooperatives.

Proprietary handlers and cooperatives were asked to indicate important factors to proprietary handlers in developing a price to pay for bulk milk under bargained exchange. Responses are shown in Table 6. Proprietary handlers indicated that the most important factor was the availability of milk supplies. Prices paid by competitors was also important. Cooperatives, on the other hand, indicated the prices paid by competitors was the most important factor to proprietary handlers in developing their price. They ranked the availability of milk supplies second in importance. It appears that cooperatives overestimated the importance of services they provide to proprietary handlers.

The nature of the bargaining relationship between cooperatives and proprietary handlers synthesizes the topics addressed in the previous four tables. Cooperative and proprietary handler perceptions of the bargaining process and their relative power positions within that process are important indicators of the exchange environment and its coordination potential. In Table 7 the responses of these two groups to several characterizations of the bargaining relationship are given. They were asked to select one of six possible bargaining relationships typifying their experience. As arrayed in Table 7 these relationships range from the cooperative having a relative power advantage over the proprietary handler to the other extreme where the handler has similar power over the cooperative.

Cooperatives indicated a balanced power relationship in the bargaining process, while proprietary handlers indicated that cooperatives had the advantage. These responses are

**Table 6. Factors important to proprietary handlers in developing a price to pay for bulk milk under bargained exchange, as reported by cooperatives and proprietary handlers.<sup>(a)</sup>**

Factor	Percentage Indicating Factor Is ...			
	Important <sup>(b)</sup>		The Most Important <sup>†</sup>	
	Co-ops	P. Handlers	Co-ops	P. Handlers
Milk supplies available	49	65	28	46
* Retail demand	18	7	2	2
* Prices paid by competitors	82	42	61	25
* Value of services received	23	5	4	—
* Availability of alternative supplies	53	29	3	15
Solvency of dairy farmers	0	4	—	2
Your power relative to the co-op	2	7	—	2
Other	2	6	2	8
			100	100

(a) An asterisk (\*) at the left hand margin indicates cooperative-proprietary handler responses to whether a choice was important were significantly different at 10 percent level based on a chi-square test. <sup>†</sup> indicates that their responses to the questions on the "most important" were significantly different at the 10 percent level based on a chi-square test.

(b) Respondents could designate more than one factor as important.



**Table 7. Types of bargaining relationships when prices above the order minimums are sought, as reported by cooperatives and proprietary handlers.<sup>(a)</sup>**

Type of Relationship <sup>†</sup>	Percentage Indicating Existence of Each Type <sup>(b)</sup>	
	Co-ops	P. Handlers
The co-op offers a price and a package of terms and the handler must take it or leave it.	5	65
Usually favors the co-op to some degree; some negotiation and compromise occur.	6	14
Balanced evenly between the co-op and the handler so that two-way bargaining does take place.	61	13
Usually favors the handler to some degree; some negotiation and compromise occur.	28	—
The handler informs the co-op of what he will pay and related terms of trade and the co-op must take it or leave it.	—	—
Other	—	8
	100	100

(a) A dagger (†) indicates that cooperative and proprietary handler responses were significantly different at the 10 percent level based on a chi-square test.

(b) Respondents were asked to select only one of the six choices.

significantly different at the 10 percent level. This is the most important discrepancy between the views of cooperatives and proprietary handlers found in these data. Proprietary handlers definitely feel that the cooperative enjoys an advantage. It's important to ask here whether or not the proprietary handler perception is indicative of the true situation. It might well be that both groups have overestimated the nature of the relationship. In general the advantage would seem to lie with cooperatives but it is not as significant as proprietary handlers indicate because proprietary handlers do have supply alternatives which discipline cooperative behavior.

A series of scale questions were asked of both groups. These questions consisted of a statement followed by five choices indicating various levels of agreement or disagreement with it. The choices ranged from "strongly agree" to "strongly disagree." The responses of cooperatives and proprietary handlers to five such questions are shown in Table 8. In order to convert the individual responses to an average response the following assignment of values was made: "Strongly agree" equals 5, "agree" equals 4, "no opinion" equals 3, "disagree" equals 2, and "strongly disagree" equals 1. Therefore an average score on a particular question of greater than 3 indicates fairly strong agreement with the statement and scores below 3 indicate general disagreement. The intensity increases as one moves toward 5 or 1. Average scores near 3 indicate that

**Table 8. Attitudes about power, bargaining and pricing as reported by cooperatives and proprietary handlers.<sup>(a)</sup>**

Statement	Mean Score <sup>(b)</sup>	
	Co-ops	P. Handlers
* Proprietary handlers are in a stronger, more powerful bargaining position than co-ops in their dealings together.	3.1	1.8
* For the entire dairy industry, bargaining between co-ops and proprietary handlers yields marketing improvements which justify the costs of making those improvements.	3.6	2.8
The Associated Reserve Standby Pool Cooperative has enhanced the cooperative's bargaining strength.	(c)	3.6
* Dairy cooperatives have squeezed the margin received by processors of milk and dairy products to a critically low level.	2.0	3.1
In the past five years, co-ops have unduly enhanced price in our market.	(c)	3.4

(a) An asterisk (\*) indicates that cooperative and proprietary handler responses are significantly different at the 10 percent level based on a chi-square test.

(b) Mean score based on simple average of individual responses based on following scale: 1 = strongly disagree, 2 = disagree, 3 = no opinion, 4 = agree, 5 = strongly agree.

(c) Question not asked of cooperative managers.

respondents had no strong feelings toward the statement.

The response to the first statement in Table 8 corroborates the answers shown in Table 7. Once again proprietary handlers feel that they are at a disadvantage in the bargaining process and cooperatives feel that the bargaining process is fairly equal. The second statement deals with the potential for the bargaining process to produce benefits for the entire dairy subsector. These benefits would normally arise from an exchange of information so that both parties are better informed. Product waste and transaction costs might be reduced and related improvements in subsector coordination made. Cooperatives felt that bargaining did yield significant improvements in these areas, while proprietary handlers were somewhat indifferent.

The Associated Reserve Stand-by Pool Cooperative (ARSPC), an organization created by several cooperatives in the Midwest and Southern regions, provides milk to cooperatives in the South in the fall and winter months when their supplies are short relative to demand. While the Stand-by Pool assists in coordinating the allocation of milk supplies across regions, it also has increased the power of some cooperatives relative to proprietary handlers. ARSPC has certain supplies in the upper Midwest under contract reducing their availability to proprietary handlers there.



Because of the important role of the Stand-by Pool, proprietary handlers were asked their opinion of whether it had enhanced cooperatives' bargaining strength. Their answer was affirmative (Table 8).

It has been suggested by some subsector observers that dairy cooperatives, as a result of their premium pricing program, have squeezed the margin received by processors to a critically low level. Cooperatives did not believe they had done this and interestingly, neither did proprietary handlers. When asked if cooperatives have unduly enhanced price in their market, proprietary handlers did not strongly indicate that this was the case. There were some interesting patterns in the response to the question within the proprietary handler population. While small and large handlers answer similarly, strong regional differences emerged. Handlers in the West disagreed as expected (2.2) while those in the Midwest agreed most strongly (3.9).

In summary there is a fairly high degree of understanding between cooperatives and proprietary handlers about the sales relationship. Perceptions on the nature of bargained exchange demonstrate less agreement, however. Cooperatives feel bargaining power is more evenly balanced between the two groups than do proprietary handlers. The true situation may be somewhere between these two perceptions. This question will be discussed later when the availability of alternative buyers and sellers for each group is presented.

### **Barriers to Harmonious Relationships between Cooperatives and Proprietary Handlers**

Two dominant types of cooperative behavior toward proprietary handlers were detected in personal interviews with these groups. The two types may be called compromiser and enforcer behavior patterns.<sup>9</sup>

Compromiser behavior is typified by cooperatives who consider proprietary handlers as equal partners. Any disparity in market power enjoyed by the cooperative is not used malevolently. Market power, representing some threshold volume of Grade A milk with alternative outlets, elevates the cooperative to an economic juxtaposition with major proprietary handlers. Managers of such cooperatives, however, do not use their power as a club nor do they amass more of it for its own sake, rather they recognize the mutual reliance of each party on the other. Compromiser coopera-

tives use a relative power advantage to relax the aggressive posture which they may have taken previously and relate to customers as equals in the market place. They seek an on-going sales relationship with proprietary handlers that endures because it is good for both parties. They often recoil from suggestions of handler acquiescence to cooperative power. They suggest that cooperative fairness and thoroughness in presenting their position to the buyers explain a continuing relationship.

The other cooperative type, the enforcer, uses its economic clout to the extent possible to obtain the terms it desires from proprietary handlers. While this approach may achieve the cooperative's short-run goals, they may be disadvantaged in the longer run. Although the final terms of an agreement between the two groups may be identical under compromiser or enforcer behavior, the attitudes formed and the coordination environment created may be dramatically different. The old familiar theme is appropriate here—it is not as much what the cooperative did that bothered the proprietary handler but how they did it.

In dealings between small cooperatives and proprietary handlers in local markets the relative power threshold could be reached by a small cooperative which would allow it to exercise some degree of enforcer behavior. Typically the low level of absolute power in these cases seems to spawn neither compromiser nor enforcer behavior. Rather, the cooperative adopts a more detached posture toward exchange. This latter observation suggests that compromiser and enforcer behavior are more typically observed among larger cooperatives.

At least half of the cooperatives interviewed could be characterized as compromisers. This may represent an important change from the late 1960s and early 1970s when cooperatives were growing rapidly and were anxious to prove themselves. Wholesale changes in the hired management of many of the large dairy cooperatives since the late 1960s suggest that the type of individuals needed to put a large cooperative together is very different from those required to keep it going in the current exchange environment.

Cooperatives of the compromiser type and proprietary handlers do disagree. Conflicts exist in these relationships but there is a high degree of mutual respect. Both parties recognize that it behooves them to strive for a solution each can live with. Cooperatives prefer to see economically healthy proprietary handlers, and handler comments indicate the converse is true. Harmony is more likely to prevail if both groups in the market are earning an adequate return. When either group is struggling economically, exchange-related problems are most likely to occur. Examples of this can be seen in the Northwest where the low margins available to proprietary handlers require them to fight to gain every possible advantage in the marketplace. The harmony in exchange between cooperatives and proprietary handlers there is diminished.

<sup>9</sup> While it is true that proprietary handlers behave in different ways toward cooperatives, their behavior patterns appeared to be more homogeneous than that of cooperatives. The major reason for this, it is suggested, is that proprietary handlers developed into large organizations with significant amounts of economic power at least 10 years prior to the development of large cooperatives. For this reason proprietary handlers' behavior has reached an equilibrium where they are responding to the cooperative. While the remainder of this section will consider behavior patterns of cooperatives, it should be kept in mind that not all proprietary handlers behave in the same way. Some are more skeptical of the contribution of cooperatives than are others and behave accordingly. However, the richest area for understanding procurement relationships is cooperative behavior.



One of the strongest disincentives to harmony between cooperatives and proprietary handlers is vertical integration of cooperatives into processing. In part, proprietary handlers are responding to the added competition but there are additional important factors as well. Regardless of whether cooperatives are competing by virtue of the ability to reblend proceeds<sup>10</sup> or other means, procuring bulk milk supplies from a source which also sells the same final product is bound to be stressful for affected proprietary handlers. Compound this with Class I premiums charged by cooperatives and their ability to reblend which can redistribute losses in any of several ways and strained relationships are almost inevitable.

Several factors affect the impact of cooperative integration into bottling. The manner in which the cooperative acquires processing facilities can affect proprietary handlers' attitudes. If cooperatives take over a processing plant because of proprietary handler default, processors' concern is less than that felt when a cooperative purchases existing processing facilities or constructs new facilities. Also, the size of cooperative processing operations elicits different proprietary handler responses. Understandably, small bottling operations concern proprietary handlers less than larger ones. Cooperatives involved only in bottling and distributing milk and dairy products are of less concern to handlers than those cooperatives which also sell some bulk milk to proprietary handlers. It's this dual role assumed by some cooperatives which causes the most friction. Cooperatives who carve out a geographical niche which does not overlap with proprietary handlers or those who fill a product niche not being filled by proprietary handlers in that market generally meet the least resistance from proprietary handlers.

When a cooperative and a proprietary handler have no choice but to deal with each other, harmony and cooperation are often high. A number of cooperatives and proprietary handlers who were interviewed expressed a belief that the more the two parties needed each other, the better was their relationship. As one cooperative manager expressed it, when there is no alternative for either side, the relationship seems to be the most harmonious because neither party has the advantage. They need each other and have to work together. Those used to the notion that the buying-selling alternatives available with competition discipline the participants and facing a monopoly situation is tantamount to powerlessness may be puzzled by this observation. Hirschman<sup>11</sup> suggests that a firm is likely to have its performance

altered when the consumers who are made unhappy by the existing performance of the firm are in a position of having nowhere else to go. The consumer who cannot take his business elsewhere has, therefore, the maximum incentive to cajole or otherwise cause the firm to pay attention to his unmet needs and tastes. Because the consumer cannot exit from the relationship he or she will be maximally motivated to bring all sorts of potential influence into play to keep the firm from doing things that he considers undesirable. The voice option, then, can cause the poorly performing firm to change its posture so as to reduce the discomfort which it feels as a result of the pressure brought to bear by the unhappy customers. This explanation fits closely many cooperative-proprietary handler relationships studied in this research and goes a long way toward explaining the behavior that was observed.

Concern over the competitiveness of the price paid by competing proprietary handlers often creates an environment for disharmony and lack of cooperation between cooperatives and their buyers. It was observed in the course of this research that the federal order system with its minimum price provisions, communicates a great deal of information to the proprietary handler. It assures him of the competitiveness of the price he paid. As long as the federal order minimum prices prevail very little communication need occur between proprietary handlers. No effort need be made to find out what price is being paid.

If a proprietary handler is not able to compete with another handler it is not due to differences in raw product cost but for some other reason. Proprietary handlers rely on the state or federal order system to reduce any uncertainty surrounding prices paid by handlers in a market. In fact, it appears that in the absence of premium prices, communication between proprietary handlers is significantly less than when premiums are in effect. When premiums get high uncertainty increases among handlers because there is more room for special concessions for certain customers.

In addition, when premiums are large those handlers buying only a partial supply from cooperatives charging premium prices enjoy a significantly lower blend price for their total supply than those with a full supply arrangement paying a Class I premium. As premiums get larger the job of communication with the handler increases in difficulty, and harmony and cooperation tend to decrease. To maintain a competitive price and convince buyers of its competitiveness requires continual monitoring on the part of the cooperative.

### Procurement Services

Two types of services necessary to milk procurement will be discussed in this section. Handler services are defined as procurement activities which benefit only buyers who pay for them. The 10 handler services identified in this study include the following: direct bulk deliveries off farms, diverting milk for manufacturing, providing supplemental milk on order, selling milk F.O.B. buyers plant, delivering

<sup>10</sup>Cooperatives need not return to their members the order minimum blend price but can pay less by reblending payments they receive for milk at or above minimum levels with cooperative expenses (including losses on operating units). This can yield a net price to cooperative members below the order minimum level. In effect, the production operation of their members can subsidize the cooperative's manufacturing or processing operations.

<sup>11</sup>See *Exit, Voice and Loyalty*, by Albert O. Hirschman, Harvard College Press, 1970.



standardized milk, splitting a load between customers, writing member checks, writing non-member checks, paying haulers, and selling direct-shipped milk on the basis of tanker weights and tests. The second type of service will be called marketwide. These include balancing supply and demand for bulk milk between markets and the disposal of Grade A milk not needed in Class I products by manufacturing it into storable commodities, typically butter, powder, and cheese.<sup>12</sup> Marketwide services benefit more than those who bear their cost. Exclusion from their benefits is difficult if not impossible. Their accomplishment serves the entire subsector. To an increasing extent both handler and marketwide services are being performed by cooperatives for proprietary handlers. In the past proprietary handlers provided more of these activities for themselves. This was due in a large part to the fact that cooperatives were smaller and less organized and therefore less able to provide these services. Proprietary handlers often maintained their own independent producers for all or a large part of their needed supply. In those cases the proprietary handler was compelled to provide these services for himself.

Almost 80 percent of all cooperatives provide the full complement of handler services (Table 9a). Exceptions to this pattern are standardized milk services, splitting loads between customers, writing non-member checks, and selling on tanker weights and tests. It is interesting to note that across all cooperative categories, the percentage of coopera-

tives providing the various services was fairly constant although significant differences within size and type categories were identified for some services. Survey results indicate that a very high proportion of proprietary handlers received the service if it was available (Table 9b).

Almost all proprietary handlers believe cooperatives could perform these services cheaper than they could. About half of the proprietary handlers feel they pay the cooperative for performing the services but almost all believe the cooperative is adequately compensated. The high percentage who indicated that cooperatives are adequately compensated despite the fact that not all indicated they contributed, may reflect the proprietary belief that the services are not as costly to provide as cooperatives believe them to be.

Approximately two-thirds of the cooperatives felt they were adequately compensated for most of these services. Approximately half of the cooperatives said that the services benefitted some buyers who did not pay for them. This response supports the answer given by handlers about their payment for these services. Cooperatives strongly concurred with the proposition that proprietary handlers recognized the value of the services to them. Virtually all proprietary handlers expressed a desire for cooperatives to continue to provide these services.

In summary, a high proportion of compatible attitudes and beliefs between cooperatives and proprietary handlers about handler procurement services was found. Satisfaction with the services was demonstrated by buyers' desire for their continuance. Cooperatives believe that proprietary handlers are cognizant of the value of these services.

Some concern was expressed by proprietary handlers for the method in which cooperatives sought compensation for

<sup>12</sup>Other marketwide services often provided by cooperatives such as research, educating producers and testifying at order hearings are not procurement-related services and therefore, will not be discussed here. Services provided only for members of cooperatives will also be excluded.

**Table 9a. Handler procurement services provided by cooperatives to proprietary handlers who are bulk milk customers, as reported by cooperatives, by size, region and type of cooperative, 1976-77.<sup>(a)</sup>**

Type of Service	Total Population	Percentage of Co-ops Providing the Service										
		Size			Region					Type		
		Small	Medium	Large	West	Central	South	Mid-West	North-east	Bar-gaining	Mar-keting	Oper-ating
* Direct bulk deliveries off farms	96	100	79	100	90	100	100	95	98	96	100	74
Divert milk for manufacturing	86	86	86	100	85	100	100	60	98	87	100	85
* † Provide supplemental milk	67	62	82	100	29	11	100	57	98	73	100	79
Sell milk f.o.b. buyer's plant	77	75	79	100	95	100	23	93	70	84	100	79
* † Deliver standardized milk	7	0	32	40	20	3	3	7	2	0	13	54
† Split load between customers	23	20	33	30	20	0	10	48	11	44	44	22
* Write member checks	80	75	96	100	100	100	100	60	70	88	100	99
Write non-member checks	5	0	20	30	14	0	10	5	6	30	30	15
* Pay hauler(s)	97	100	81	100	90	100	100	97	98	92	100	84
† Direct-shipped milk sold on tanker weights & tests	48	43	65	70	23	93	23	38	96	31	57	73

(a) \*, ‡, † indicate significance at the 10 percent level for size, region and cooperative type, respectively. In each case, the null hypothesis is that the mean of all sub-samples and the total sample are equal. Ratio scale variables were tested with an F test (ANOVA). A chi-square test was employed for non-ratio scale variables.



**Table 9b. Availability and acceptance<sup>(a)</sup> of handler procurement services to proprietary handlers by cooperatives as reported by proprietary handlers, by size and region of proprietary handler, 1976-77.**

Type of Service <sup>(b)</sup>		Percentage Prop. Handlers Acknowledging Availability/Acceptance							
		Total Population	Size Group		Region				
			Small	Large	West	Central	South	Mid-West	North-east
Direct bulk delivery off farms	Available	94	93	100	79	100	91	94	100
	Receive	93	92	100	100	85	100	93	90
Divert milk for manufacturing	Available	89	90	86	94	85	91	91	89
	Receive	76	73	94	58	46	89	83	82
Provide supplemental milk	Available	100	100	100	100	100	100	100	100
	Receive	92	92	86	100	82	95	93	85
‡ Sell milk f.o.b. buyer's plant	Available	89	89	91	79	100	100	87	78
	Receive	83	81	95	100	85	100	66	79
Deliver standardized milk	Available	34	37	19	52	45	30	22	39
	Receive				insufficient observations <sup>(c)</sup>				
‡ Split load between customers	Available	26	27	16	42	15	20	2	67
	Receive				insufficient observations <sup>(c)</sup>				
‡ Write member checks	Available	95	95	100	79	100	100	100	87
	Receive	87	87	83	100	61	95	89	82
‡ Write non-member checks	Available	34	35	27	42	45	0	48	0
	Receive				insufficient observations <sup>(c)</sup>				
Pay the hauler(s)	Available	97	97	91	97	100	100	98	89
	Receive	93	94	88	100	97	93	91	85
‡ Direct-shipped milk sold on tanker weights and tests	Available	75	76	67	55	82	86	54	90
	Receive	89	88	92	58	100	83	79	100

(a) Percentage accepting (receiving) the service is based only on those to whom it is available.

(b) \* and ‡ indicate significance at the 10 percent level for size and region, respectively. In each case, the null hypothesis is that the mean of all sub-samples and the total sample are equal. Ratio scale variables were tested with an F test (ANOVA). A chi-square test was employed for non-ratio scale variables.

(c) Due to the low availability, not enough firms answered this question to make percentages meaningful.

both types of procurement services. Buyers were concerned that when separate charges for these services were not established, ascertaining the comparability of prices charged to different handlers was more difficult. Proprietary handlers favored the use of service charges instead of over order premiums to obtain compensation since separation of raw product cost and the cost of associated services is facilitated. Over half of the cooperatives surveyed indicated the use of service charges to get compensation for providing handler services, while a third relied on over order premiums. The remaining cooperatives employed both methods.

Marketwide services are being provided by marketing and operating cooperatives to an increasing degree. The operation of pumpover facilities, receiving stations, and manufacturing facilities by cooperatives allows them to provide the marketwide services of supply balancing and intra-and inter-market supply alignment. The effects of these services normally accrue to all in the market regardless of the intended recipients. By their nature they often give rise to problems for the providers in covering the provision costs and for both the providers and the recipients of devising equitable cost-sharing plans.

Cooperative providers of marketwide services, such as reserve and surplus disposal, frequently charge that other subsector participants are free-riding on cooperatives' efforts. This charge may mean that the cooperative is not being adequately compensated and/or there are some

participants who are benefitting without sharing in the cost. Both of these cases raise equity concerns. Approximately three-quarters of proprietary handlers indicated that cooperatives' efforts at balancing supply and demand and disposing of reserve and surplus supplies benefitted them and they did pay for it in some way. Almost 90 percent of these handlers felt cooperatives should continue to provide these services. The issue, however, of marketwide services is far from being settled. The concern for equity and overall efficiency still exists.

If markets are to be balanced, the milk not needed in Class I products must be manufactured. Proprietary handlers are doing less and less reserve and surplus milk disposal. Cooperatives are assuming more and more of this responsibility.<sup>13</sup> However, they are not satisfied with the

<sup>13</sup>Debate continues over whether disposal is a service as cooperatives insist or a monopolizing strategy as the Federal Trade Commission and Justice Department have contended. There is a validity to both arguments. It is certainly true that owning or having access to manufacturing facilities and operating them for reserve and surplus disposal both serves the market and increases the market power of cooperatives. The use of manufacturing facilities to gain market power is recognized and understood by both groups of participants. It partially offsets the power of proprietary handlers acquired by virtue of their size, facilities, and milk's perishable nature. This power, however, can be abused. Capper-Volstead and antitrust legislation provide two means to rectify abuses of cooperative power. Milk supplies from nontraditional cooperatives and independent producers also furnish some discipline on this power as does inter-cooperative competition. The issue of checks on the power of market participants will be more fully discussed in a latter section of this report.



compensation for their marketwide service activities. Some cooperatives have used over-order premiums to offset the costs of marketwide services. Others have established service charges for these marketwide functions. Compensation methods such as these have several shortcomings.

There are many reasons to suggest that capturing compensation for marketwide services through over-order premiums is inappropriate or impractical. For one reason, handler procurement services may have a partial or total preemptory claim on such revenues. Additionally such premiums may be economically justified to elicit desired on-farm production. In such cases, revenue should not be diverted from producers to pay for services that are considered by most not to be the responsibility of the producer. Of course, compensation for marketwide services out of over-order premiums cannot occur if over-order premiums are not collected.

Another reason against use of premium financing is the lack of information this method conveys to buyers about their competitive position relative to other handlers. This is a concern of buyers because they wish to know what they and others are paying for the product and all services surrounding it. Without this knowledge the comparability of sales terms is difficult for buyers to establish. A strong consideration in using Class I premiums to defray costs of marketwide services has yet to be mentioned. It is based on a concern for equity. If over-order premiums pay for marketwide services then only those who buy from cooperatives pay.

Furthermore, compensation for marketwide or handler services from premiums assesses each buyer equally on a hundredweight basis, regardless of the particular services needed or requested. In addition with a flat per unit Class I premium for all buyers, those who buy a larger share of their milk supply from cooperatives pay proportionally more than those who buy a smaller share, creating an equity problem between cooperative customers.

If marketwide activities are paid for by a separate service charge most problems associated with over-order revenue financing are avoided. However, service charges still have to be collected and even if collected, only those buying from participating cooperatives have contributed. If service charges do not differentiate between full and partial supply customers, further inequities can result.

Some private solutions exist such as requiring that any reduction in purchases by a proprietary handler be proportional among all suppliers. However, this solution like many others, requires buyer magnanimity or cooperative power for effective implementation. If the market is allowed to function as it currently is doing, when a cooperative with manufacturing facilities cannot operate them profitably, they will go out of business or close their manufacturing facilities. Such pressures are being felt by a growing number of cooperatives. If this occurs in a market the balancing and disposal responsibility will pass to

proprietary handlers—the only other group in the market who can perform it if cooperatives fail.

This would not seem to be in the interest of overall subsector performance since it is expected that total subsector balancing and disposal costs in any market would increase if this were done by individual proprietary handlers. Cooperatives handle larger volumes than most proprietary handlers and so are better able to provide these services at a lower cost due to their volume and closer relationship with dairy farmers. If disposal is to be performed at the potentially lowest cost, some solution appears to be necessary in many milk markets which could provide compensation to those performing marketwide services.

### Competitiveness of Procurement Markets

Traditional economic theory would indicate that performance of the system is at the highest level when large numbers of buyers and sellers exist in a market. In most fluid milk markets in the U.S. there are only a few buyers for the farmers' milk. In markets where large cooperatives dominate there are only a few sellers from which proprietary handlers may choose. Does this situation indicate that performance of the system is poor? Stated alternatively, do cooperatives or proprietary handlers enjoy the power necessary to put the other at a disadvantage and reduce system performance? These are some of the questions that need to be addressed when the competitiveness of procurement markets is discussed.

The results of this study indicate that despite the small number of buyers and sellers present in most fluid milk markets in the U.S., the environment is highly competitive. No one cooperative or proprietary handler is able to take advantage of the other for more than a short time.

Cooperatives and proprietary handlers were asked whether proprietary handlers had satisfactory sources for their milk supply other than dairy cooperatives. Cooperatives indicate that handlers had satisfactory alternative sources. While proprietary handlers took some exception to this, responses of the two groups were not dramatically different. This question does not capture the full range of alternatives available to proprietary handlers because neither independent producer sources nor National Farmers Organizations and Farmer's Unions were included in this statement. Proprietary handlers indicated that they had as many as three cooperative suppliers in their market area, indicating some usable cooperative supply alternatives.

More detail on proprietary handler buying decisions is provided by a survey question. The most important reason given by proprietary handlers on why they bought bulk milk from cooperatives was that the cooperative was the only supplier in the area. However, proprietary handlers also indicated that they purchased from cooperatives because they offered a particular service or group of services. They often purchased from cooperatives because they did not want to worry about coordinating supplies from many



individual farmer shippers. It must be concluded that some proprietary handlers are restricted by the lack of alternatives to cooperative sources of supply in many markets but the options of most proprietary handlers are not severely limited when all supply sources are considered.

There are several other factors which affect the buying options of proprietary handlers. Proprietary handlers' size restricts their choice of sources of bulk Grade A milk. In the short run there is more flexibility but large volume dealers cannot tolerate for long the uncertainty associated with buying distressed milk, milk brought in from long distances, erratic quality, fluctuating quantities or unpredictable delivery schedules. Tight scheduling of processing activities, milk's special handling characteristics, sales commitments, and the importance of quality combine to make the scheduling and consistency of bulk milk deliveries of foremost concern to the proprietary handlers. Their supply coordination problems are magnified as their plant volumes increase.

To work with more than four or five cooperatives poses nearly as high transaction costs as maintaining a group of independent producers, at least for those dealers who have some expertise in providing their own supply. If processors are going to buy from a cooperative, they usually prefer to deal with a small number of them. Integrated food chains and large independent handlers who require 500,000 gallons of milk a day or more, normally prefer no more than two sources for any one plant. One of these sources may be a group of independent producers. The quantities these handlers require and their efforts to minimize transaction costs limit the number of viable suppliers large proprietary handlers have.

In some areas, large proprietary handlers are offered no choice for a single stable supply source other than a cooperative—especially if the buyer does not wish to develop an independent milk supply. Sources of partial supply do exist in most markets and can have significant disciplinary effects on cooperative performance.

The relationship among cooperative-administered prices across areas also affects large proprietary handlers' options. If a large dealer goes outside the local area to procure milk supplies, the competitive effects can be significant. If spatial price differences are sufficient to entice outside milk in, after allowing for increased transportation and service costs, large processors must be wary. Removing a large quantity from local demand may set in motion a series of geographical price adjustments between cooperatives such that the effective local blend price drops to at or below the net price offered by the more distant supplier.

Large handlers may find themselves trapped in a supply situation that puts them at the mercy of local processors enjoying the reduced blend and the local cooperative(s) which can operate on the geographical price difference. The possibility encourages buyer efforts to improve the performance of the local cooperative before distant supply sources are developed.

Pooling requirements under federal orders can affect the availability of alternative supplies in both directions. Pooling requirements are minimum Class I sales percentages which proprietary and cooperative supply plants must satisfy in order to classify as pool plants and share in Class I sales in the order. These performance requirements, as they are often called, vary between orders and are instituted to insure the handlers' commitment to serve the Class I market. If performance requirements are tight, cooperatives may be anxious to sell large volumes for Class I use on a regular basis in order to qualify their manufacturing plants.

Finding a cooperative supplier willing to provide all the Class I needs of a proprietary handler may be easy under these conditions. In other areas where marketing and operating cooperatives are prevalent and pooling requirements are very loose, transaction costs of milk procurement for a proprietary handler can be high.

From this discussion, it is clear that proprietary handlers are disciplined in their procurement behavior by their size, the relatively small number of cooperative suppliers, and if they are large handlers, by the geographical price surface and pooling requirements under federal orders. The bargaining power of the cooperative and federal and state marketing order rules also serve to discipline proprietary handlers' behavior toward cooperatives and dairy farmers in general.

The number of suppliers that a proprietary handler maintains has implications for subsector performance. Numerous proprietary handlers have two or more supply sources for the bargaining leverage it affords. If multiple suppliers are already established each furnishing a partial supply, the ability to quickly and easily switch a greater portion of the business to one or the other of the cooperatives serves to discipline the bargaining demands of all the cooperatives. A large proprietary handler described the strategy of diffusing cooperative power by maintaining at least two suppliers at each of their plants. Buying their total needs from one cooperative would be foreclosing an outlet for minor cooperatives. This foreclosure would force the merger of the smaller cooperatives with the larger one and further concentrate cooperative power.

Proprietary handlers may choose to buy from more than one source in order to use a cooperative as their residual supplier. The cooperative involved bears all the supply balancing plus reserve and surplus disposal costs for the buyer. The other suppliers ride free. This buyer behavior has prompted some cooperatives to call for a supply arrangement which penalizes such buyers for disproportionate changes in purchased quantities among the several suppliers. An alternative plan would enjoin them from engaging in such conduct. Some proprietary handlers choose a single supplier for the improvements in exchange and operating efficiency realized from better scheduling of deliveries, closer quality accountability, reduced transaction costs and increased cooperative concern for full supply customers.



What disciplines dairy cooperatives in their conduct toward proprietary handlers? The major disciplining factor on cooperatives is availability of alternative supplies. Sources of alternative supplies are other cooperatives, independent producers, and non-traditional cooperatives such as the National Farmers Organization and Farmer's Union Milk Marketing Cooperative.

Dairy farmer cooperatives are not always able to work together. This may develop in markets where competition between dairy cooperatives is intense. It provides a disciplining effect on cooperatives which proprietary handlers are often able to take advantage of.

There is also a significant number of dairy farmers who do not wish to join cooperatives. The percentage of farmers belonging to cooperatives is high on a national basis and is very high in certain markets. In other markets the percentage of cooperatives is under 50 percent. It does not require a large percentage of independent producers, perhaps as few as 15 percent in a market before significant disciplining pressure can be brought to bear on cooperatives.

The growth in recent years of National Farmers Organization and the Farmer's Union as supply sources for proprietary handlers has provided yet another buyer alternative. Cooperation between nontraditional and traditional cooperatives is virtually nonexistent in most market areas. It is important to examine independent producers and non-traditional cooperatives as sources of supply in more detail.

Independent producers are a viable source of supply for many proprietary handlers. Their use by processors forces cooperatives to maintain competitive prices to their members lest they leave the cooperative. The existence of independents provides a means for processors to counteract over-order premiums and discipline other facets of cooperative procurement behavior. The number of independent producers and the volume they represent need not be large to have a significant effect. In certain situations proprietary handlers need not actually receive any independent producer milk to derive its benefits. The potential for this supply source is threat enough.

Proprietary handlers use independent producers to counteract over-order premiums. Premiums may be reduced by competitive credits when independent producers (or incidentally, other cooperatives) are willing to sell below the premium price but the most significant use made of independent producers is for the purpose of circumventing premium prices. Consider the following example: If the Class I premium charged by a cooperative in a market with 50 percent Class I utilization is 50¢/cwt., a 90 percent Class I utilization proprietary handler can often acquire independent producers or cooperative members by offering a 35¢-45¢ private premium. This is because a 50¢ premium in a 50 percent utilization market is worth only 25¢ per cwt. on the blend price but a 90 percent utilization handler can offer up to a 45¢ premium and incur no additional cost over the cooperative premium. Producers would receive a higher blend price than under the cooperative plan and so would

have an incentive to become or remain independent. This form of producer-processor behavior gives rise to cooperative charges of free riding on pricing successes of the cooperative.

Cooperatives often charge independent producers with inflicting a disproportionate share of the balancing and disposal costs on them. Proprietary handlers are loathe to terminate or reduce purchases from independent producers when demand drops or supplies increase because of the adverse effect on their desirability and the resulting increase in the merits of cooperative membership. When the handler is also buying milk from a cooperative, such behavior puts pressure on the cooperative to be the residual supplier by bearing the balancing and disposal costs for that handler when the cooperative does not supply all of their needs.

National Farmers Organization (NFO) and National Farmer's Union Milk Marketing Cooperative provide yet another type of supply alternative in many markets. Their effects on over-order premiums and their use as a general disciplining force on conventional cooperatives are identical to that of independent producers. They have an advantage over independent producers from the buyers' standpoint because they can deliver large quantities and like conventional cooperatives reduce buyers' transaction costs of milk procurement. NFO and Farmer's Union do provide many of the same handler services that other cooperatives provide but since they have few facilities, contribute little to marketwide procurement responsibilities.

The disciplining effects of NFO and Farmer's Union are often used directly by a buyer when nontraditional cooperatives furnish a partial supply. On other occasions a proprietary handler need not buy from them to gain some benefits. Competitive credits may be enjoyed or the level of the overall premium reduced as a result of NFO or Farmer's Union presence in a closely coordinated market such as that created by Central Milk Producers Cooperative in Chicago.

NFO and Farmer's Union have typically sold milk at 10¢-20¢/cwt. under prevailing over-order prices except in cases where Class I supplies were scarce. Most proprietary handlers who had experience with these organizations admitted the necessity of a price concession by these sellers to compensate for quality and service deficiencies. They contended, however, that competitive pressure on conventional cooperatives is worth some foregone quality or service.

As long as cooperatives offer a competitive price, consistently deliver top quality milk in the large volumes required, and reduce transaction costs for buyers, they will be the major supplier in a market. In any fluid market if cooperatives' pricing behavior fails to remain competitive, if their bargaining behavior becomes unreasonable or if their processing activity produces conflict, proprietary handlers in most cases can and will develop other supply sources. If net member prices are depressed over a year or more due to poor management or free rider problems, cooperative membership will drop. Many of these produc-



ers will remain independent and reduce the volume controlled by cooperatives. Proprietary handlers in some markets, particularly in the Northeast, stand ready to take on these producers as independent shippers.

This section has indicated that a large number of supply sources is not necessary for market discipline even when significant power is vested in one or a unified group of cooperatives. Cooperative pricing and general marketing behavior is effectively disciplined in most cases. Typically, sufficient regional differences within large cooperatives and inter-cooperative competition exist to thwart monopoly behavior. NFO, Farmer's Union and independent producers also discipline the behavior of large cooperatives.

Proprietary handlers are disciplined by intense competition between relatively few handlers operating in any one market, by federal and state order rules, and by the power of dairy cooperatives.

Active competition was observed within cooperative and proprietary handler populations as well as between representatives of these groups in most markets. Subsector performance does not appear to be hampered by the relatively small number of buyers and sellers in a market. To the contrary, coordination is facilitated by the small number of large participants. This is not to suggest, of course, that monitoring the behavior of large organizations need not be done to assure desired performance.

### SUMMARY

Primary data collected from a mail survey of randomly selected U.S. dairy cooperatives and proprietary handlers were used to describe and analyze their Grade A milk procurement relationships. The objectives of the research were to better understand the complex procurement relationships that exist in the dairy subsector and to assess the market power of each group and the competitiveness of the exchange environment. In addition to the surveys, in-depth interviews were conducted with managers of 50 cooperative and proprietary handler firms.

Dairy cooperative operations are large and complex. The average cooperative spanned a three-state area, had 652 members and handled 304 million pounds of milk (1976). Many cooperatives sold farm supplies (73 percent), owned equipment for off-farm hauling (56 percent), contracted for off-farm hauling (64 percent), manufactured products (30 percent), processed products (23 percent), distributed products (33 percent), and owned retail outlets or routes (16 percent).

Proprietary handlers processed an average of 240 million pounds of Grade A milk into fluid and soft dairy products (1976). Over 70 percent of this volume was purchased from cooperatives. Fifty-two percent of these processors also operated manufacturing plants for butter, powder, cheese, etc. Proprietary handlers packaged 21 percent of their processed products under private labels. Sixty-eight percent

of the handlers operated retail routes or owned retail outlets.

Each cooperative indicated 30 possible buyers for their members' milk, although each proprietary handler stated only three cooperatives sold milk in their area. The average cooperative sold to eight buyers. Cooperatives indicated that 47 percent of their customers buy under a full supply arrangement and that 41 percent of their members' milk is committed under these arrangements. Forty-four percent of the proprietary handlers buy their bulk milk exclusively from one cooperative under a full supply arrangement. Of these, 60 percent were formal, written contracts and the balance were informal, verbal agreements. Seventy percent of the proprietary handlers reported paying premium (over-order) Class I prices.

Cooperatives and proprietary handlers were asked about their preferences and attitudes with respect to each other, the procurement needs of each and pricing practices. A high degree of understanding and compatibility was demonstrated between the two groups. Cooperatives thought market power in milk procurement was more evenly balanced between both groups than did proprietary handlers. Handlers felt they were in a weaker bargaining position than cooperatives.

Several barriers to harmonious exchange relationships were identified in this research. Cooperative management can behave as a compromiser, working harmoniously with the buyer, or as an enforcer, exercising as much control over the buyer as it can. Enforcer-type cooperatives and those who integrate into bottling do not foster harmony in procurement. It was also found that when buyer and seller had no option but to deal with each other, cooperation was high. Finally, pricing systems that create a climate of uncertainty among proprietary handlers about the competitiveness of the price they pay do not contribute to a coordinated procurement system.

A high level of satisfaction on the part of proprietary handlers was found with the procurement services provided by cooperatives. Most cooperatives felt they were receiving adequate compensation for all services except those with marketwide benefits. For these services no consistently effective system of compensation existed for use by all cooperatives. This was especially true for the marketwide service of manufacturing excess Grade A milk.

The competitiveness of procurement markets was carefully examined. Both parties have a limited number of alternatives but the conduct of each is usually disciplined effectively in this nonatomistic environment. Several factors are responsible for the discipline imposed on proprietary handlers, including their large size and reduced flexibility, the small number of suppliers and marketing order provisions. Cooperatives are disciplined primarily by the availability of alternative supplies of Grade A milk to proprietary handlers from independent farmers, NFO, Farmer's Union and other cooperatives.



## Outlying Field Research Stations

These research units bring the results of research to the users. They are geographically located in Michigan to help solve local problems, and develop a closeness of science and education to the producers. These 15 units are located in important producing areas, and are listed in the order they were established with brief descriptions of their roles.

- 1 **Michigan Agricultural Experiment Station.** Headquarters, 101 Agricultural Hall. Established 1888. Research work in all phases of Michigan agriculture and related fields.
- 2 **South Haven Experiment Station,** South Haven. Established 1890. Breeding peaches, blueberries, apricots. Small fruit management.
- 3 **Upper Peninsula Experiment Station,** Chatham. Established 1907. Beef, dairy, soils and crops. In addition to the station proper, there is the Jim Wells Forest.
- 4 **Graham Horticultural Experiment Station,** Grand Rapids. Established 1919. Varieties, orchard soil management, spray methods.
- 5 **Dunbar Forest Experiment Station,** Sault Ste. Marie. Established 1925. Forest management.
- 6 **Lake City Experiment Station,** Lake City. Established 1928. Breeding, feeding and management of beef cattle and fish pond production studies.
- 7 **W. K. Kellogg Biological Station Complex,** Hickory Corners. Established 1928. Natural and managed systems: agricultural production, forestry and wildlife resources. Research, academic and public service programs.
- 8 **Muck Soils Research Farm,** Laingsburg. Plots established 1941. Crop production practices on organic soils.
- 9 **Fred Russ Forest,** Cassopolis. Established 1942. Hardwood forest management.
- 10 **Sodus Horticultural Experiment Station,** Sodus. Established 1954. Production of small fruit and vegetable crops. (land leased)
- 11 **Montcalm Experimental Farm,** Entrican. Established 1966. Research on crops for processing, with special emphasis on potatoes. (land leased)
- 12 **Trevor Nichols Research Complex,** Fennville. Established 1967. Studies related to fruit crop production with emphasis on pesticides research.
- 13 **Saginaw Valley Bean and Sugar Beet Research Farm,** Saginaw. Established 1971, the farm is owned by the beet and bean industries and leased to MSU. Studies related to production of sugar beets and dry edible beans in rotation programs.
- 14 **Clarksville Horticultural Experiment Station,** Clarksville. Purchased 1974. Plots established 1978. Research on all types of tree fruits, small fruits, vegetable crops and ornamental plants.
- 15 **Northwest Michigan Horticultural Research Station,** Traverse City. Established 1979. Research and education for cherry and other horticultural crops in northwest Michigan.

