ASPECTS OF THE DAIRY COOPERATIVE'S ROLE IN THE VERTICAL COORDINATION OF THE DAIRY SUBSECTOR

by

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ABSTRACT

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Dairy cooperatives are actively involved in many areas of the dairy subsector. This research concentrates on the cooperative's coordinating activities within the cooperative (micro - micro coordination); between the cooperative and processors and handlers (micro coordination); and the cooperative's efforts to match aggregate supply and demand (macro coordination).

There are many impediments to coordination. Milk is a perishable and bulky product in its raw state. Furthermore, the seasonal supply and demand of dairy products are unsyncronized. Also, there are biological lags in output, and there is a great degree of asset fixity throughout the entire dairy subsector. Dairy cooperatives can enhance coordination by providing services or instituting programs that address these problems.

Cooperatives undertake a wide range of coordinating activities. In order to make the research manageable three activities: multiple component pricing

(MCP) systems, supply management programs, and the marketwide services of seasonal balancing and marketwide information are analyzed. The method used to test the hypotheses concerning these activities is analysis by case study. This method provides more in depth research results than other methods when dealing with vertical coordination.

The research yielded the following results. It was determined that coordination at all levels is improved somewhat via MCP systems, because the quality of milk has improved. Also, technical efficiency is improved and surpluses can be reduced through supply management programs administered by cooperatives. The marketwide services of seasonal balancing and marketwide information also enhance vertical coordination at all levels by reducing uncertainty and adding stability to the subsector in a cost effective manner.

This research uncovered four aspects of the relationship between cooperatives and vertical coordination. In order for a cooperative to effectively enhance vertical coordination, it must have the support of the membership and at least some degree of market control. It was determined that cooperatives are uniquely qualified to perform some coordinating activities. Also, in order for cooperatives to perform some coordinating activities, especially if they lack sufficient market control on their own, regulation such as Marketing Orders, or national policy have to be changed.

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This dissertation is dedicated to my parents, Al and Jean. Without them, none of this would have been possible.

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CHAPTER 1: INTRODUCTION

1.1 Background

Agricultural cooperatives can best be defined as voluntary organizations comprised of farmers or other farmer cooperatives. Cooperative arrangements can be viewed as a general mode of organizing economic activity between members of the cooperative and those subsector participants who interact with the cooperative. The majority of dairy farmers are members of cooperatives.

Cooperatives have been part of the dairy subsector for many years. Cooperatives have been associated with cheesemaking since 1860, and have been bargaining with other subsector participants since 1889 (Knapp, pp.69,71). These bargaining units were the forerunners of today's marketing cooperative. By 1920 cooperatives were well established in all aspects of the dairy subsector (Knapp, pp.222-223).

The role of cooperatives in the dairy subsector has become larger with the passage of time. As Table 1 shows, cooperatives's share of all milk sold to plants and dealers has risen from 59.1 percent in 1957 to 77 percent by 1980 (Stafford and Roof, p.6; Manchester 1983, p.59). Table 1 also shows that cooperatives's share of total

butter production has risen from 58 to 75 percent, and cooperatives's market share of the dry milk industry has risen from 57 to 90 percent from 1957 to 1981 (Manchester 1983, p.84). These figures serve as evidence of the important role cooperatives play in the dairy subsector. A more complete picture of this role, both past and present, is shown in Table 1.

Table 1: COOPERATIVES'S SHARE OF MILK DELIVERED TO PLANTS AND DEALERS, AND SHARE OF TOTAL OUTPUT OF SELECTED MANUFACTURED DAIRY PRODUCTS

(percent of total)

	Year			
Commodity	1957	1964	1973	1981
Milk Hauled	59.1	67.2	75.8	77.0a
Butter	58	65	66	75b
Natural Cheese	18	21	35	50b
Dry Milk Products	57	72	85	90b
Cottage Cheese	7	15	13	14b
Ice Cream and Ice Milk	4	5	5	5b

a = 1980 data; b = estimated

(Sources: Stafford and Roof, p.30; Manchester 1983, pp. 59,84)

Table 1 shows that cooperatives are the primary source of some commodities and their importance in terms of market

share has, for the most part, increased over time. Cooperatives's large role in some industries may place them in an unique position to affect the vertical coordination of the entire subsector.

1.2 Vertical Coordination

This research focuses on the cooperative's role in the vertical coordination of the subsector. Vertical coordination can be defined as "all the ways of harmonizing the vertical stages of production and marketing" (Mighell and Jones, p.1). A more simple way of defining vertical coordination is the matching of supply and demand of a commodity, or a set of commodities (like dairy products), from the farm to the consumer. A well coordinated subsector will match supply and demand from the farm through to the consumer across time, space, and form. This is difficult for a subsector as complicated as the dairy subsector.

There are several reasons for studying vertical coordination. Analysis of the vertical coordination of a subsector improves the understanding of those involved in the subsector (Mighell and Jones, p.1). This enhanced understanding could lead to improved coordinating mechanisms and institutions and therefore improve the performance of the subsector. Another reason for analyzing vertical coordination is to determine the effects of various coordinating mechanisms on the subsector (Mighell

and Jones, p.1). Again, this allows those involved in the subsector to alter their practices in a way that would enhance coordination. However, the single most important reason to analyze vertical coordination is to determine the fundamental problems the subsector faces and to institute mechanisms and programs which would address these problems. This would improve the matching of supply and demand within a subsector. The next section deals with the impediments to coordination facing the dairy subsector.

As the previous section outlined, dairy cooperatives are major actors in the subsector. They are an instrument that farmers can use to exercise control over marketing stages beyond the farm (Mighell and Jones, p.2). They can be used to enhance or impede the coordination of the subsector. Given problems facing the dairy subsector such as asset fixity and the seasonality of production and consumption, to name two, dairy cooperatives may have a role to play in improving the vertical coordination of the subsector. They can address these problems to the benefit of all subsector participants.

Unfortunately, traditional welfare economics cannot be used to analyze vertical coordination in the dairy subsector. Institutional restrictions such as oligopolistic markets and imperfect resource mobility, to name a few, make achieving Pareto Optimality impossible. Furthermore, given the theorem of second best: if one of

the conditions for Pareto Optimality do not hold, it is therefore not necessary nor desirable to satisfy the remaining conditions (Henderson and Quandt, p.316) to maximize the welfare of subsector participants. This complicates the analysis and forces a researcher to look for other performance criteria in determining the role the cooperative plays in the coordination of the dairy subsector.

1.3 Impediments to Coordination

There are several aspects of the dairy subsector that make coordination difficult. In its raw state, milk is highly perishable and has a high potential for transmitting diseases. Therefore, milk must be handled carefully. Furthermore, milk is bulky which also makes it difficult to handle (Fallert, Miller and Sleight, p.2).

There are several biological aspects of dairy production that also makes coordination difficult. The seasonality of supply and demand is unsyncronized. The output of milk is highest in the spring and summer when demand is at its lowest, and the output of milk is lowest in the fall and winter when demand is highest. Furthermore, there are biological lags in output and there is a high degree of asset fixity throughout the entire dairy subsector. Inputs used for the production of dairy products have few, and in many cases, no alternative uses. This makes investment and disinvestment decisions critical

in enhancing or harming the coordination of the subsector. Dairy cooperatives can enhance coordination at various levels by providing services or instituting programs that address some of these problems.

In addition, there are some fundamental market relationships that need to be considered. Demand for some dairy products is highly inelastic (Fallert, Miller and Sleight, p.2), and output per cow has been steadily increasing. This helps explain the existence of downward price pressure, the exit of dairy farmers out of the market, and the continued large surpluses of dairy products. If dairy cooperatives can find a way to curb these surpluses, or develop new markets for dairy products they will have served a crucial role in improving coordination.

A potential difficulty that affects dairy cooperatives directly is the free rider. Free riders are subsector participants that benefit from the activities full service cooperatives undertake without sharing the costs. An example is those participants who benefit from a cooperative's seasonal balancing operations but do not share the costs of transportation or operating manufacturing plants. Dairy cooperatives may face three types of free riders. Producers who do not belong to the cooperative, limited service cooperatives who do not offer the wide variety of services provided by full service

cooperatives, and some processors and handlers. Free riders may reduce the ability and desire of cooperatives to engage in some coordinating activities.

1.3 Performance Criteria

In order to determine how well coordinated the subsector is, or areas where coordination could be improved, performance goals must be determined. These performance criteria are useful in determining how well coordinated a subsector is from the farm to the consumer. If a subsector meets these criteria it would be strong evidence that the subsector is well coordinated. If one or more of these goals is not met, then performance probably could be improved. The following measures will be useful: the extent to which supply matches demand at prices consistent with the opportunity cost of resources; the level of technical and operational efficiency of the entire subsector; and accessibility to the subsector, including market foreclosures and opportunities such as the condition of entry; and perhaps most importantly, the reliability and stability of the subsector (Marion, p.51). Table 2 lists performance goals and measures.

Measurement of some of these performance criteria will be difficult. Potential performance measures are also listed in Table 2. The degree to which supply matches demand can be determined by analyzing the existence of

Table 2: PERFORMANCE GOALS AND MEASURES

GOAL	MEASURES
Supply Matches Demand at Prices Consistent with the Opportunity Cost of Resources	Degree of Surpluses or Shortages; Comparing Returns Within the Subsector to Returns in Other Subsectors
Technical and Operational Efficiency	Economies of Scale; Per Unit Costs: Introduction of New Technologies and Institutions
Accessibility to the Subsector	Extent/Existence of Barriers to Entry and Exit
Reliability and Stability of the Subsector	Degree of Price and Output Volatility; Amount of Resource Movement

shortages or surpluses in a market. Determining the opportunity cost of resources is complicated by the fact that there is a high degree of asset fixity in the dairy subsector. Probably the best proxy is comparing returns within the dairy subsector to those outside the subsector. Technical efficiency is always difficult to measure. Technical efficiency is improved in the dairy subsector if the cost of dairy products is reduced by improving the physical flow and timing between links of a marketing chain (Campbell and Clevenger, p.5).

How cooperatives adapt to changes in the environment, as well as the introduction of new products and institutions is one way to analyze technical efficiency

and progressiveness. Economies of scale are another aspect of technical and operational efficiency. The question of accessibility can be analyzed by the barriers to entry and exit within the subsector; the ease of exit may be particularly important given recent surpluses in the dairy subsector. Stability can be analyzed by a study of price volatility and resource movement within a particular market.

1.4 Synopsis of Research

Given this backdrop, two questions emerge. The first is what activities do dairy cooperatives currently pursue that enhance vertical coordination? The second is what activities could cooperatives potentially pursue to enhance the vertical coordination of the subsector? As previously mentioned, cooperatives are a major actor in the dairy subsector, and they may be in a position to improve vertical coordination through a number of activities.

The research will use a subsector approach, analyzing the various participants in the dairy subsector and how cooperatives interact with them at the different levels of coordination. This approach is useful when analyzing vertical coordination. It allows a researcher to view the relationship cooperatives have with their members, and with other subsector participants. Furthermore, it allows a researcher to analyze the cooperative's role in matching the aggregate supply and demand of dairy products.

The research will use case studies and personal interviews to gather data and test hypotheses.

The research focuses on three different coordination activities: multiple component pricing, supply management, and the marketwide services of seasonal balancing and marketwide information. These activities will be discussed in much more detail in Chapter 3. Cooperatives undertake a wide range of coordinating activities as outlined in the next chapter. Through careful analysis of multiple component pricing, supply management, and the two marketwide services, generalities concerning dairy cooperatives and coordination can be obtained.

CHAPTER 2: COORDINATION ACTIVITIES PURSUED BY DAIRY COOPERATIVES

2.1 Vertical Coordination and Coordinating Activities

Stated in simple terms, vertical coordination is matching the supply and demand of a commodity from the farm to the consumer. The subsector participant that is the focus of this research is the dairy cooperative. How it interacts with producers, processors and handlers, and the fundamental forces that determine supply and demand.

The research is based on coordination at three different levels. The first level is coordination within the cooperative (micro - micro coordination). Aspects of micro - micro coordination include relations between the different areas of management within the cooperative. However, the most fundamental aspect of micro - micro coordination is the relationship between the management of the cooperative and the membership of the cooperative. How they interact with each other in administering various activities the cooperative undertakes.

The second level of coordination is that between individual firms at different levels of the marketing chain and the cooperative (micro coordination). The fundamental micro coordination relationship is that between the

cooperative and proprietary firms; fluid handlers and firms which manufacture dairy products. Aspects of this relationship include meeting the needs of proprietary firms and various operating agreements between a cooperative and fluid handlers and manufacturers.

The last level of coordination analyzed is matching total supply and demand (macro coordination), which is a critical issue in the dairy subsector. It deals with the interaction between a dairy cooperative and fundamental market conditions. Macro coordination issues include methods to reduce or eliminate shortages and surpluses in a market. The final level of coordination deals with matching aggregate demand with aggregate supply for the economy as a whole (macro - macro coordination) (Shaffer, p.2). Macro - macro coordination is beyond the scope of this research.

It appears that dairy cooperatives have the potential to improve the coordination of the subsector by performing certain activities. Some of these coordinating mechanisms viewed in the broadest sense are: pricing, contractual agreements, vertical and horizontal integration, collective organization, and information systems (Cook et al., p.62). Table 3 lists the various broad coordinating activities and the different levels of coordination that are affected by these activities.

Table 3: SYNOPSIS OF COORDINATING ACTIVITIES

Coordination Issue or Activity	Level of Coordination: Micro - Micro	Micro	Macro	Macro - Macro
Pricing	X	X	X	X
Contractual Agreements	X	X	X	
Vertical and Horizontal Integration		X	X	
Collective Organization	X	X	X	
Information Systems	X	X	X	X

Pricing and information systems affect all levels of coordination. Pricing is the prime coordinating mechanism in most U.S. subsectors and affects the economy as a whole. Information systems promote coordination at all levels by aiding the decisionmaking abilities of subsector participants. Vertical and horizontal integration are important activities at the micro and macro levels. Collective organization and contractual agreements affect micro - micro, micro and macro coordination. Specific examples of the various coordinating activities dairy cooperatives perform, and how they affect the coordination of the subsector, is the focus of this chapter.

2.2 Micro - Micro Coordination

Cooperatives offer a wide array of services that affect vertical coordination. Some of these benefit their members and may be seen as a type of micro - micro coordination; examples would be: check weight and testing, undertaking field services and quality improvement, and furthermore, guarantees of markets and payment (Cook et al., pp.21-23). Most of these, however, aid more than just the farmer members who appear to receive most of the direct benefits. They ensure product quality which reduces uncertainty and may increase demand. Guaranteed payment and a market source for a dairyman's product may reduce the risk and uncertainty faced by producers and may lead to improved decisionmaking. These services may also lead to improved stability in the subsector as well. The services just outlined benefit many subsector participants.

Perhaps the most fundamental relationship facing those involved with dairy cooperatives is that between the owner members and their cooperative management. This is another aspect of micro - micro coordination. The farmer members attempt to control management through political processes, purchases of stocks, and through entering or exiting the cooperative (Shaffer, p.6). Depending on the relative size of the cooperative, the individual member, and other factors, these attempts of control may fail.

If the cooperative is very large, and undertakes

many tasks, it is possible that the cooperative's management is too far removed from the producer to be responsive to his desires. Whether or not member producers can effectively voice their concerns may be a problem, especially for large cooperatives. Information flows between management and producers may also be difficult for large cooperatives. Management may not feel that interaction with membership is as important as other activities. However, the information infrastructure may be better for a large cooperative than a small one. The marginal cost of supplying an additional member information is probably low, and the information gathering capabilities of a large cooperative may be greater than those of a small cooperative.

Sound micro - micro coordination may be critical if the cooperative is to be effective in enhancing vertical coordination. Management and membership must agree to, and understand, the activities the cooperative undertakes. Misunderstanding will lead to a loss of membership, which will cause the cooperative to lose its market control, and eventually lead to a break down of the cooperative's ability to affect vertical coordination through the various activities it pursues.

2.3 Micro Coordination

2.3.1 Contractual Agreements

Dairy cooperatives also provide services that benefit handlers relative to others. Cooperatives are in a position to provide milk in a given quantity, at a specified time (Cook et al., pp.21-23). Some cooperatives also balance cream supplies. They assemble and find outlets for the cream that fluid handlers do not need. These services also act to reduce risk and uncertainty, and may also reduce transaction costs. These agreements may also help promote stability in the market which may be beneficial to other market participants.

These agreements are contractual in nature. A major type of contractual agreement is full supply arrangements. Since the 1940s, cooperatives have agreed to meet the exact demand of processors, especially for fluid use (Manchester 1978, p.6). These agreements reduce the cost of obtaining milk and reduce the uncertainty and instability in the market because demands are known and accounted for before the product is actually marketed. The reduced uncertainty and increased stability improves coordination at all levels; guesswork is reduced, and investment or disinvestment decisions for fluid handlers and manufacturers, as well as producers, can be made with greater confidence.

Cooperatives also enter into contractual

agreements with each other when bargaining for super pools and through the use of such institutions as the Associated Reserve Standby Pool Cooperative (Cook et al., p.72). These last two types of agreements tend to be more useful for macro coordination because they deal with the subsector as a whole. These contractual agreements make it difficult for one subsector participant to exploit another; once the agreement is signed, participants have committed themselves. Moreover, they serve to reduce transaction costs, and they provide information which may lead to a better coordinated market.

While contractual arrangements may reduce uncertainty and transaction costs, they do not eliminate them. Furthermore, the cost to those who are liable for obligations that cannot be fulfilled can be quite high. Possibly in an attempt to reduce these costs, cooperatives have vertically integrated into the dairy subsector. In addition to vertical integration, they have also entered into joint ventures with processors and handlers. Vertical integration and joint ventures are becoming an increasingly important aspect of the dairy subsector.

2.3.2 Vertical and Horizontal Integration

Vertical integration can be defined as "coordinating technically separable activities in the vertical sequence of production and distribution of products under the control of a single entity" (Shaffer,

p.3). There are many reasons for vertical integration. Some of them are as follows: it centralizes control and reduces transaction costs, internalizes externalities, and captures economies of scale (Shaffer, p.3). The most important coordination aspect of vertical integration, however, is the reduction of uncertainty (Shaffer and Staatz, pp.55-56).

Cooperatives have integrated forward in a number of areas (Marion, p.85). In the dairy subsector they appear to have integrated into butter powder and have more recently expanded their cheese manufacturing operations (Manchester 1983, p.197). Some argue that the reason cooperatives have vertically integrated in the dairy subsector is due to dairymen's perceptions of the market power that is derived from processing and handling commodities and not from a desire to improve the coordination of the dairy subsector (Marion, p.85). Nonetheless, cooperative plants apparently have a lower cost structure than proprietary plants (Schader et al., p.18). If this is the case, cooperatives are probably improving the coordination of the subsector as long as they stand ready to market all the milk made available to them. They are probably increasing the degree of competition at the processor level.

A related way of improving micro coordination may be through joint ventures; dairy cooperatives entering

into business arrangements with proprietary firms. This is also a type of contractual agreement. This obviously reduces the risk that each organization bears and may allow for greater investment and market expansion. Cooperatives have undertaken joint ventures in the past (Cook et al., p.52). These arrangements allow a cooperative to expand its geographic area, as well as increases access and expertise beyond the processing level. In exchange, the proprietary handler receives a secure source of product (USDA, ERS 1984B, p.56).

Another related aspect of vertical integration is the growth of cooperatives into areas where they have not traditionally been active. As previously mentioned, over the years, they have become active in processing Grade B milk and surplus manufacturing of Grade A milk (Cook et al., p.75). Moreover, the responsibility for assembly of milk supplies has shifted to cooperatives over time (Cook et al., p.81). It may be argued that cooperatives have filled in as a "missing hero," a market participant that steps in and provides a service or performs a function that no other participant is willing to undertake. Dairy cooperatives were the only participants willing to undertake the activities outlined above where the coordination of the subsector was in need of improvement or where performance was declining.

A type of horizontal integration is the

cooperative federation. These federations first began in the Midwest during the 1960s (Manchester 1978, p.6). This entails a contractual agreement between cooperatives. Under the agreement, the federation contracts to perform a particular function or group of functions for the cooperative. Some of these functions include: the exchange of information, bargaining, operating a mechanism for movement of milk from surplus to deficit areas at a known price, and moving manufacturing grade and Grade A milk to manufacturing facilities. These functions help provide information that reduces uncertainty and helps balance supply and demand which is the critical aspect of macro coordination. Federations are discussed in further detail in Chapters 7 and 8.

Mergers are another type of horizontal integration. The 1960s witnessed the creation of Dairymen, Inc. and Mid - American Dairymen, Inc. (Williams et al., pp.67-68). These large regional cooperatives are a result of mergers involving smaller cooperatives.

2.4 Macro Coordination

2.4.1 Marketwide Services

Currently, dairy cooperatives undertake several tasks which benefit many participants in the dairy subsector. Many of these activities have been discussed in the micro - micro and micro sections of this chapter. These services may have a positive impact on macro

coordination. Some of these functions include: managing and routing the milk supply, and providing for disposition of milk used for fluid products (Manchester 1983, p.281). The fact that cooperatives stand ready to purchase all of their membership's milk reduces uncertainty and ensures a market for dairymen and a source of product for handlers. Cooperatives also supply market information and may be the only subsector participant willing to balance and manage supplies. If this is the case, cooperatives play a major role in macro coordination by stabilizing markets.

Cooperatives incur costs when they provide marketwide services. The costs of providing these services rose 427 percent between 1973 and 1980 (Babb, p.1). However, it is difficult for cooperatives to charge those who benefit from these services. Marketwide services have public good characteristics. Some cooperatives, through bargaining, have been able to offset some of these costs through negotiating over - order premiums.

Over - order premiums are simply the difference between the price a cooperative negotiates and the minimum fluid milk price set by the Federal Milk Marketing Order. The Orders do not set the maximum fluid milk price. Some argue that the existence of over - order premiums are evidence that cooperatives are generating excess profits (Manchester 1983, p.207). However, as long as cooperatives stand ready to take all the milk that is offered them,

their ability to charge high prices will be severely limited (Jesse and Johnson 1980, pp.7,31-33). Competition also plays a role. In highly competitive markets, a full service cooperative is probably unable to recover the costs of providing marketwide services. The price the cooperative receives will be too low for it to cover the costs of providing these services. If a cooperative, or cooperative federation, dominates a market it may be able to recover all the costs of the services through over-order premiums (Manchester 1987, p.4).

A possible solution to this issue would be to develop a way to pay cooperatives for the marketwide services they perform. This would help distinguish the cost of these services from other cooperative charges (Manchester 1983, p.281), and help determine whether or not cooperatives exert monopoly power. Furthermore, these charges would reduce the free rider problem. Free riders may make it difficult for cooperatives to improve coordination. Most of these issues will be discussed in more detail in Chapter 3.

2.4.2 Other Macro Coordination Issues

Another major issue in dealing with macro coordination is supply management. As pointed out in Chapter 1, the biological and fundamental market aspects of the dairy subsector make macro coordination difficult. Recent surpluses, coupled with high government

expenditures, have caused some to question the effectiveness of dairy policy. It appears that at recent price levels surpluses will result; a sign of poor macro coordination. Cooperatives may be able to administer some type of direct supply management program to alleviate this problem. Dairy cooperatives have a history of administering supply management programs.

Perhaps the greatest coordination mechanism that affects all levels of coordination is pricing. Agents react to price signals and adjust. If, for some reason, prices do not reflect actual supply and demand conditions, coordination, particularly at the macro level, will be adversely affected; surpluses or shortages will result. If a cooperative is able to price effectively, coordination would improve. Currently, this may not be the case.

2.5 Summary of Coordinating Activities

Table 4 lists the various coordination issues and activities that dairy cooperatives undertake. Table 4 is an expansion of Table 3. A major difference between Tables 3 and 4 is the inclusion of supply management as a coordinating activity. Another difference between Tables 3 and 4 is that collective organization is not listed in Table 4. This is because dairy cooperatives, by their very nature, are a type of collective organization that undertakes all these activities. Table 4 lists coordination activities and issues at a more specific

Table 4: TAXONOMY OF COORDINATING ACTIVITIES AND ISSUES FACING DAIRY COOPERATIVES

Cooperative Issue or Activity	Level of Coordination		
	Micro - Micro	Micro	Macro
Pricing			
1. Pricing by butterfat	X	X	X
2. Multiple Component Pricing	X	X	X
Contractual Agreements			
1. Farmer - Management	X		
2. Full Supply Arrangements		X	X
3. Joint Ventures		X	X
4. Marketwide Services			
a) check weight and testing	X	X	
b) field service and quality improvement	X	X	
c) guarantees of market and payment	X	X	X
d) transportation	X	X	X
e) balancing	X	X	X
f) marketwide information	X	X	X
g) cream balancing		X	X

Table 4: continued

Cooperative Issue or Activity	Level of Coordination: Micro - Micro	Micro	Macro
Vertical and Horizontal Integration			
1. Mergers		X	X
2. Cooperative Federations		X	X
3. Vertical Integration		X	X
Information Services			
1. Flows of Information Between Members and Management	X		
2. Educational Programs	X	X	X
3. Advertising and Other Market Development Programs			X
Supply Management	X		X

level; it deals with the activities dairy cooperatives perform that affect the coordination of the dairy subsector. Table 3, for the most part, provides a general structure to analyze coordination. Table 4 lists concrete aspects of dairy cooperatives and coordination.

As Table 4 shows, cooperatives pursue many activities that affect coordination at different levels. The preceding discussion was based primarily on the level or levels of coordination that are most affected by the activity. This chapter provides a background for coordination and the mechanisms that influence coordination. A subset of these coordinating activities that cooperatives perform will be the focus of this research.

CHAPTER 3: CONCEPTUAL FRAMEWORK AND RESEARCH ISSUES

3.1 Hypotheses

The first two chapters have provided the background on vertical coordination and some of the issues involved with respect to dairy cooperatives. The taxonomy, as shown in Table 4, outlined a number of coordination activities and issues facing dairy cooperatives at the various levels of coordination. A complete analysis of all these activities is beyond the scope of this research.

The research will focus its efforts on the following activities: multiple component pricing, supply management, and the marketwide services of balancing seasonal supplies and marketwide information. Table 5 shows the different levels of coordination that are affected by these activities. This is a subset of Table 4. The focus of Chapter 5 will be multiple component pricing, the focus of Chapter 6 will be supply management, and the focus of Chapter 7 will be the two marketwide services of seasonal balancing and marketwide information.

Table 5: COOPERATIVE ACTIVITIES STUDIED IN THIS RESEARCH

Cooperative Activity	Level of Coordination		
	Micro - Micro	Micro	Macro
Multiple Component Pricing	X	X	X
Supply Management	X		X
Marketwide Services			
1. Seasonal Balancing	X	X	X
2. Marketwide Information	X	X	X

Each of these activities are controversial issues facing those in the subsector. All these activities affect more than one level of coordination. Furthermore, each of these activities seek to match supply and demand in various ways and in the case of seasonal balancing at various times and at various locations. Dairy cooperatives may be able to enhance coordination through these activities. In order to analyze aspects of vertical coordination in more detail, the following hypotheses will be tested.

Hypothesis I: Given that there has been a shift away from dairy products with a high butterfat content, pricing by butterfat content may give an incorrect market signal and lead to the misallocation of resources. If dairy cooperatives administer a multiple component pricing (MCP) system then coordination at all levels would be

improved because the price signal would more closely reflect current demand conditions. Furthermore, MCP may improve the quality of the milk supply, which would also enhance coordination. Manufacturing plants may be able to process milk more efficiently. Cooperatives, if they have sufficient support and control, may be uniquely qualified to administer an MCP system.

Hypothesis II: At current farm price levels there appears to be a tendency for overproduction of dairy products. Quantity supplied exceeds quantity demanded. If cooperatives are able to administer some type of supply management program then macro coordination will be improved; surpluses would be reduced or eliminated. Supply management would also affect micro - micro coordination by controlling the amount of milk a dairyman could market.

Hypothesis III: If cooperatives perform the marketwide services of seasonal balancing and marketwide information then coordination is enhanced by reducing uncertainty, improving decisionmaking, reducing costs, and increasing stability. Both of these services are performed by cooperatives and benefit more than just their membership.

However, once the service is provided, it is difficult to exclude those who do not pay for the service from benefitting from it. Furthermore, these services once provided, can be used by many, if not all, market

participants. These facts make it difficult for cooperatives to be adequately compensated for the costs they incur when providing these services. If cooperatives currently are not adequately remunerated for these services then performance may be enhanced through alternative payment schemes.

3.2 Multiple Component Pricing

3.2.1 Background

One type of pricing system is pricing by butterfat content. Consumer tastes appear to be changing toward those products that have a low butterfat content. The single most important reason why butterfat pricing is no longer the effective price mechanism it was at one time, is because it no longer reflects consumer and processor preferences. Over the past two decades, per capita consumption of cheese, yogurt, lowfat and skim milk has increased while per capita consumption of whole milk, cream, and butter has declined (Harrington, p.1; Graf 1974, p.4). This situation has led to an increase in the value of other milk constituents relative to butterfat (Graf 1977A, p.5). Table 6 shows the changing consumption patterns of selected dairy products.

Table 6: PER CAPITA COMMERCIAL USE OF SELECTED DAIRY PRODUCTS

(pounds)

	Year				
Commodity	**1970**	**1975**	**1980**	**1983**	**1986***
Whole Milk	214	179	145	130	117
Lowfat and Skim Milk	51	78	96	101	119
Butter	4.4	4.4	3.9	3.8	3.8
American Cheese	6.8	7.9	8.9	8.9	9.8
Other Cheese	4.4	6.1	7.9	9.0	11.0

(* = estimated)

(Source: Fallert, Miller and Sleight, p.36; USDA, ERS 1987A, p.16)

Consumers have evidently substituted lowfat and skim milk for whole milk, reduced their consumption of butter and increased their consumption of cheeses. However, butterfat pricing encourages the production of milk high in fat and ignores those components, such as protein, that manufacturers and consumers want, and may be willing to pay for.

If cooperatives could institute a pricing regime that would compensate dairymen for producing milk that has characteristics that consumers and processors want, coordination at all levels may be improved. Micro coordination would be improved because technical efficiency

could be enhanced if the composition of milk were altered so that more manufactured dairy products could be produced with a given hundredweight of milk. Macro coordination would be enhanced because the changed composition of milk would more accurately reflect current consumer demand. This would help match supply with demand and change the makeup of products in the market. It could contribute to progressiveness in the subsector.

Perhaps in an attempt to meet these changing demand conditions, cooperatives are increasingly using another type of pricing mechanism, multiple component pricing. Under this type of system, the price of milk is partly determined on its protein or solids - not - fat (SNF) content (Manchester 1983, p.280). This would reduce the incentive to produce milk with a high butterfat content and increase the incentive for dairymen to produce milk with the characteristics desired by processors and consumers.

Cooperatives may be in an unique position to administer MCP systems. Their functions usually include writing member checks and testing members's milk. Cooperatives usually meet the basic requirements needed to institute an MCP system. If a cooperative assigns values to protein or SNF which reflect consumer and processor preferences, then coordination at all levels would be improved.

3.2.2 Types of MCP Systems

There are several types of component pricing mechanisms currently in use. One type is end use pricing; a producer's milk price is based on the price received for the final product. Another type of component pricing is premium systems; a dairyman receives a premium for the production of milk that exceeds a certain protein or SNF level. A third type of component pricing system is through the use of deductions; a deduction system is the opposite of a premium, a dairyman is penalized if the protein or SNF content of his milk is below the threshold level. Another mechanism that combines the premium and deduction programs is neutral zone systems. Under a neutral zone system, no money is deducted nor is a premium paid for milk that falls within the established range. The final MCP system is a premium incentive; this pays a premium to a producer who has increased his protein or SNF level from the same time in the previous year (Covington, p.1057).

These systems are based either on cheese yield, protein content, or SNF content. Under cheese yield or end use product pricing a processor can determine a dairyman's price by multiplying the yield by the price of cheese and subtracting the processing margin (Alexander and Novakovic, p.1103). Producers which have herds that produce milk with a high protein content would automatically receive more for

their milk than other producers because the higher the protein content the greater the cheese yield.

Protein and SNF systems increase or decrease the amount a producer receives based on the protein or SNF content of the milk he produces. Both of these programs generally supplement and not replace butterfat pricing (Graf 1984A, p.1).

Another aspect of most MCP systems are quality controls. High somatic cell counts reduce the yield potential of milk. Some plans penalize producers whose milk's somatic cell and bacteria count is above a threshold. Other plans pay premiums to producers whose milk has a low somatic cell or bacteria count. These quality controls may work as a market signal and give producers another reason to control mastitis and other dairy herd health problems. These quality control programs may serve to improve the quality of milk which would, in turn, affect coordination by improving consumer acceptance, enhancing efficiency of manufacturing plants, and improving the uniformity of the milk supply.

3.2.3 Impacts of MCP Systems

Most of these pricing plans encourage producers to produce milk with desirable characteristics. They either penalize producers who do not meet the standards and/or they pay a premium to those producers who exceed the standards. This type of pricing appears to be an

increasingly accepted part of the dairy industry with about 50 percent of all milk marketed now subject to multiple component pricing (Covington, p.1091).

Multiple component pricing may give the dairy subsector a more accurate market signal and improve the matching of supply with demand. Some argue that MCP will provide a market signal to dairymen and that they will change their breeding and management practices (Alexander and Novakovic, p.1112; Zurborg, p.4). Also, MCP systems may indicate what processors as well as consumers are willing to pay (Harrington, p.14). An MCP system will give processors a better signal if the system improves the relationship between raw milk and the yields of manufactured dairy products (OMMB, p.28).

The adoption of an MCP system will affect most dairy subsector participants. Most MCP systems have been instituted and supported by cooperatives. Some producers, especially those who follow good management practices, will benefit from an MCP system. The profitability of those who follow poor management practices will probably be reduced. MCP could alter management and breeding practices due to the changed market signal. MCP could eventually lead to production of more protein and SNF in the entire subsector. MCP systems will be close to a zero sum game for dairymen unless the increased nutritional value of milk leads to an increase in demand for dairy products. If this

happens the majority of dairymen will benefit.

The greatest impact of MCP systems will be felt by manufacturers and fluid milk processors. Manufacturers could pay more for high protein or SNF milk and pay less for low protein or SNF milk. Again, the profitability of the manufacturing industry as a whole does not appear to be dramatically affected by MCP systems, the increased cost of high protein or SNF milk will be offset by its capacity to yield more manufactured product. However, there is the potential for significant impacts on the fluid market.

3.2.4 Impacts on the Fluid Market

The single biggest problem with MCP systems is the possible disruption of the fluid milk market. MCP systems could raise the price for fluid milk handlers. Unlike cheese manufacturers, fluid milk processors may not receive any benefit from a greater protein or SNF content. However, fluid milk plants that compete with manufacturing plants which have an MCP system for raw product will be under pressure to include some type of MCP system. If fluid plants do not utilize an MCP system they may lose some of their source of product (Graf 1984B, p.773). MCP has the potential to drive Grade A milk from fluid to manufacturing uses if the incentive is great enough (Christensen, p.10).

Perhaps a more fundamental issue is the potential impact an MCP system would have on the quality of fluid

milk. The current FDA and California standards for fluid products are shown in Table 7.

Table 7: EXISTING STANDARDS FOR FLUID MILK

	FDA Standards		California Standards	
	Butterfat	SNF	Butterfat	SNF
	(percent)			
Product				
Whole Milk	3.25	8.25	3.5a	8.7b
Lowfat Milk	0.5 - 2.0	8.25	1.9 - 2.1	10.0
Skim Milk	<0.5	8.25	≤0.25	9.0

a = allowed to equal 3.4 provided total solids are 12.2
b = allowed to equal 8.6 provided total solids are 12.2

(Source: USDA, ERS 1984A, p.2)

The FDA standards are less than the average for raw milk from the farm. In its raw state, milk contains on the average, 3.7 percent butterfat, 3.3 percent protein, 87.6 percent water, with the rest made up of other solids - not -fat besides protein. Total SNF levels, on the average, comprise 8.7 percent of milk (USDA, ERS 1984A, p.1). The California standards are included because some believe that they should become the FDA standards.

It may be difficult for fluid handlers to meet the FDA requirements if high SNF milk goes to manufacturing uses. If the incentives are great enough, milk with a high SNF content or milk high in protein and with low somatic

cell and bacteria counts will go to manufacturing uses and poor quality milk will go to the fluid market. This would most likely lead to a reduction in the demand for fluid milk and an eventual reduction in fluid handler income, which would eventually adversely affect the incomes of dairymen. There is the potential for underutilization of fluid processing plant and a reduction in coordination of the entire subsector if the issue of how fluid handlers should be treated is not addressed.

There are several ways to deal with fluid handler concerns. One way is through the negotiation of Class I premiums. Class I milk is milk that is used in the fluid market. The Class I premium reflects the additional costs of meeting Grade A requirements, the cost of transporting milk for fluid consumption, the cost of producing milk in the market, and the supply and demand conditions for milk including the cost of alternative supplies (USDA, AMS 1981, p.25). This is the plan currently advocated by the National Milk Producers Federation (NMPF) (Graf 1984B, p.773). If the Class I differential is great enough then the needs of the fluid market will always be met first.

Another alternative is to use the money from overall plant profits and using them to fund an MCP system (Graf 1984B, p.773). For example, this would be possible for a vertically integrated cooperative that operated

fluid and manufacturing plants. However, the method most often discussed in handling this potential disparity between fluid and manufacturing processors is by raising the SNF standard for fluid milk.

A study by the Ontario Milk Marketing Board (OMMB) states that the most equitable system would be to standardize the SNF of fluid milk through fortification if necessary (OMMB, p.21). Ultrafiltration can be used for this purpose (Poulsen, p.814). Standardization would ensure that fluid handlers and manufacturers would utilize the same raw product. Fluid handlers would be able to pass the cost of fortification on to consumers.

However, there are some aspects of standardization that may adversely affect fluid handlers. The profitability of some fluid handlers may decline if the market they operate in is competitive or if they cannot pass all of the increased cost of standardization on to consumers. In the period from 1969 - 1981, the percentage of fortified lowfat skim milk sold in Federal Milk Order markets fell from 76 to 20 percent (Boynton, p.11). Consumers are moving away from fortified products. Some argue that consumption would drop and prices would rise if the standards for fluid milk were increased.

Others argue that raising the fluid milk standards would increase consumption. Raising the standards would increase the uniformity of the product and

improve its taste. Furthermore, it would improve the nutritional value of milk (Zurborg, pp.7-8). It is felt that these attributes will make milk more popular among consumers, which would increase demand, and that their welfare, along with the welfare of processors and producers, will improve if standards are raised.

3.2.5 Breadth of the Program

An issue that affects coordination and makes instituting an MCP system more difficult is how large an area the system should cover. Some favor a national program (Hoard's Dairyman 1983, p.1420). In order to have such a national system several things would have to occur. The most important condition that must be met is that the program would have to be acceptable to all regions of the country. As part of this system, uniform price relationships will have to be determined. However, a national program may not be needed. Many MCP systems have evolved on their own, and could be incorporated into the Federal Milk Marketing Order system.

It has also been argued that if the Federal Milk Marketing Orders were amended for MCP systems they would become more standardized and consistency would be improved (NMPF, p.1). All milk in the market would be treated the same. The USDA has recently recommended that a protein program become part of the Great Basin and Lake Mead Marketing Order. This is the first instance of an MCP

system becoming part of a Milk Marketing Order. A major reason for this recommendation is that uniformity among processors both in, and near, the Order area would be improved (USDA, AMS 1987, p.26). Uniformity of MCP systems within a market area would probably promote stability. However, it may not be necessary to amend the Federal Orders in all areas to achieve this.

3.3 Supply Management

3.3.1 Background

At the current price levels, there appears to be a tendency for overproduction in the dairy subsector. Table 8 shows net USDA removals of dairy products in selected years.

Table 8: NET USDA REMOVAL OF DAIRY PRODUCTS

	Year							
	1960	1965	1970	1975	1980	1983	1985	1986*
Net Removals (billion pounds)	3.1	5.7	5.8	2.0	8.8	16.8	13.2	10.6

(* = estimated)

(Source: Fallert, Miller and Sleight p.40; USDA, ERS 1987B p.23)

Table 8 shows that there has been a surplus of dairy products in the recent past and the problem has gotten worse over time. The fact that there was a reduction in USDA purchases in 1986 was due to the effects of the Dairy

Termination Program (DTP), which was an attempt by the government to curb surpluses. Macro coordination (the matching of aggregate supply and demand) could be improved given this situation. In order to eliminate overproduction, while at the same time keeping prices at the same level, supply management programs have been introduced.

In the U.S., supply management has tended to be administered by cooperatives, although there has been a history of state programs. Cooperatives have used either quotas, base - excess plans, or Class I plans to manage the supply of their members's production. Although supply management programs vary in structure, their basic purpose is to determine a producer's market share by setting a limit on how much he can produce or market (Secretary of Agriculture, p.22).

3.3.2 Impacts on Coordination

Direct supply management would improve vertical coordination for a number of reasons. Supply management would reduce uncertainty and make investment and disinvestment decisions in plant and equipment easier. It may place an emphasis on cost reduction and therefore improve technical efficiency at the farm level. However, it may also fix production patterns (Nott and Hamm, p.1), and make some technical efficiencies which would be gained from economies of size impossible to obtain. However, the

most fundamental way supply control would improve coordination is that it would eliminate surpluses at price levels that society apparently feels are equitable or at least politically feasible.

As previously stated, if cooperatives could manage supply, surpluses could be reduced or eliminated. This would be evidence of enhanced macro coordination. Perhaps cooperatives can reduce the incentive to overproduce through levies or other penalties for overproduction.

3.3.3 Types of Programs

Many supply management programs use some type of quota or allocation system. A milk quota or allocation places a limit on the amount of product a dairyman can bring to market during a certain period of time (Secretary of Agriculture, p.22). Any milk a dairyman markets in excess of his quota or allotment receives a lower price. An extremely difficult task however, is assigning the amount of milk that each producer is allowed to market.

Another supply management system is the base-excess plan. In the past, base - excess plans have been used to manage seasonal or intrayear supply fluctuations. The first base - excess plan was established in 1918 by the Maryland State Dairyman's Association. This type of program was adopted by several other cooperatives during the 1910s and 1920s (Metzger, p.64) although they have been

used more recently as well.

Under a base - excess plan, a producer establishes a base during the low production months, or during the time of year when fluid demand and output are approximately equal. During the high production months a producer is paid one price for output equal to his base and a lower price for milk in excess of his base (USDA, AMS 1981, p.29). This plan would encourage producers to increase output during the fall and winter, and may discourage increased output in the spring and summer.

Several conditions must be met in order for a base - excess plan to be successful. In order to control production, a base - excess plan must limit entry of new producers, limit base transfers, and limit revisions of bases. Also, the price for excess milk must be below the marginal cost of producing it (Lough and Fallert, p.6). There are very few recent examples of base - excess plans administered by cooperatives. Most base - excess programs are incorporated into the various Federal Milk Marketing Orders.

Another type of seasonal supply management program which is part of some Federal Orders are "Louisville plans". This type of supply management program withholds money due producers in the flush production period and pays the producers back in the short period (USDA, AMS 1981, p.29). This creates an incentive for a

producer to increase production in the short period as compared to the flush season.

Another type of supply management program is Class I plans. This type of program attempts to tailor production to meet the demand for fluid milk. A producer is given a share of the fluid market. This becomes the producer's Class I base. All the milk he produces up to this amount usually receives the Class I price. All production in excess of his Class I share receives a lower price, usually the Class III price. Class I plans are very similar to base - excess plans, the difference being that Class I plans attempt to curb chronic surpluses whereas base - excess plans are focused more on seasonal surpluses.

Establishing Class I plans for Federal Milk Marketing Orders was part of the 1965 farm bill. The programs were popular in some areas in the late 1960s and early 1970s, but interest has waned since then. The authorization for Class I plans was discontinued in the 1981 farm bill (Kaiser, p.2).

3.3.4 Basic Supply Management Considerations

There are several conditions that must be met in order for a supply management program to be effective. Estimates of supply and demand must be accurate for both present and future time periods. This is needed in order to ensure that supply and demand are, and will be, well matched. Another necessary condition is that entry must be

limited; if this is not the case, new entrants will come into the market. This will eventually increase supplies and put downward pressure on prices.

Another important aspect of any supply management program that is effective is that producers cannot have any incentive to produce more than they are allowed. If the system is constructed in such a way that the marginal revenue of producing an extra hundredweight of milk above the allotment is greater than the marginal cost of producing that extra hundredweight then the system may break up. If there is not sufficient incentive for producers to stay within their allotments, output will not be curbed, and downward price pressure will result. The legal entity that administers the program, whether or not it is a cooperative, must have the power to limit entry and to eliminate the incentive to overproduce. Finally, legal authority may have to be established which allows output to be controlled and monitored. It appears that the dairy subsector either meets or can meet these criteria.

Most of the milk produced in the U.S. flows through cooperatives. Cooperatives may be in a position to manage the supply of their members's milk. Cooperatives are in almost daily contact with their members and are in a position to measure output. Also, due to the fact that most cooperatives write member checks and market their membership's milk, they are in a position to penalize those

producers who may be responsible for the surplus. Furthermore, in some markets, a single cooperative has almost complete control over the market. This would make a supply management program easier to maintain and enforce. These factors make cooperatives potential administrators of supply management programs.

There are two types of supply management programs that need to be considered: seasonal, intrayear supply management, which attempts to mitigate seasonal fluctuations in supply; and interyear supply management, which attempts to eliminate chronic surpluses. Seasonal supply fluctuations may be controlled through a seasonal or monthly allotment for each producer. Many programs have some type of seasonal supply management mechanism. If these programs are effective then chronic problems are less likely to develop.

3.3.5 Further Considerations

There are several issues involved with quota, base - excess, and Class I programs. If entry is blocked, the quota or base will likely acquire value. The value of quota or base will change for a number of reasons. Changes in the price of milk will affect quota or base values, as will changes in the supply or demand of quota or base (Hubbard, p.7). If these values get too high it may be a signal for the agency administering the program to increase the amount of quota or base. However,

technological advances and the effect they have on the costs of producing milk probably will have the greatest impact on the value of quota or base (Hubbard, p.9). Also, other input cost changes, especially changes in the price of feed, will affect the profitability of dairy farming and will affect quota or base values.

Once a quota program or base - excess plan is instituted, it could be difficult to eliminate because of the values that quota or base will likely acquire and the lost wealth the holders of the bases would face if the program was eliminated (Lough and Fallert, p.15). Furthermore, these programs may be difficult to eliminate even if the quotas or bases are not transferable. The wealth of those currently engaged in dairy farming would increase through higher land, cows, and other input values. The profitability of dairy farming would be capitalized through the value of farmer owned inputs.

There are also structural matters involving these programs that need to be analyzed because they probably affect vertical coordination. Most of these programs are very similar but they are not identical. An important matter is the price of excess or overquota milk. How this price is determined by cooperatives, and whether or not it provides sufficient incentive to curb production is a critical issue in determining how effective a program is in improving macro coordination. Another issue is what

type of allotment is used and how well the program matches supply with demand.

Another important consideration is whether or not there is a "use it or lose it" aspect of the supply management program. This ensures that quotas or bases are used and not owned purely for speculative purposes. If producers are forced to utilize the quota or base then the market will be assured of a constant supply, there will be no shortfall in production. If the quota is not used, it may lead to market disruptions. A related issue is the methods used to transfer quotas or bases. If quotas or bases are nontransferable, the structure of dairy farming may become fixed. Technical efficiency may be constrained if quotas or bases are not easily transferred. How these are transferred may affect the progressiveness and resource structure of dairy farming.

3.4 Seasonal Balancing and Marketwide Information

3.4.1 Theoretical Considerations

Some aspects of marketwide services have been discussed in Chapter 2. This section will focus its attention on the marketwide services of seasonal balancing and marketwide information. There are two aspects of seasonal balancing and marketwide information that make it difficult for cooperatives to receive payment for providing these services. Once a cooperative provides these services, it is usually prohibitively expensive for the cooperative

to keep others from using or benefitting from them. They are high exclusion cost services (Schmid, pp. 43-44). This is especially true for seasonal balancing. It is somewhat easier to block others from using individual types of information such as annual reports or member publications. Another aspect of these services is that they are joint-impact goods (Schmid, p.70). The additional cost of providing the service to another user is zero. This is true for seasonal balancing and many types of information services.

Another problem is establishing costs. It is difficult to determine the costs of some services and to identify payment for services from milk price quotations (Carley et al., p.2). This leads to problems between the cooperative and other subsector participants which could adversely affect vertical coordination.

The fact that it is expensive to exclude others from utilizing these services leads to the problem of the free rider; those who benefit from the service but do not bear any of the cost of providing the service. There are three types of free riders. The first is the individual producer who does not belong to the cooperative. He benefits from the stability the cooperative provides through its marketwide services without bearing the cost. The second is the limited service cooperative, which does not pay for the service but benefits from the fact that

another cooperative does provide the service. An example of this is a limited service cooperative which does not operate manufacturing facilities because another cooperative operates manufacturing plants to balance supplies. The third type of free rider is the processors and handlers who do not pay for the service. An example of this would be proprietary firms that avail themselves to some of the marketwide information services provided by the cooperative without paying for them.

Vertical coordination may be improved if the cost of these services was shared by the beneficiaries. Apparently cooperatives will not expand these services if they have to bear the entire cost (Graf 1977B, p.9). The existence of the free rider may adversely affect vertical coordination.

3.4.2 Seasonal Balancing

Production of milk is highest in the spring whereas the demand for dairy products is strongest in the fall and winter. This fact leads to surpluses and shortages. In the spring, the surpluses become reserve supplies which are disposed of in manufacturing plants. In the fall, these reserves are used for Class I use (NMPF 1986, p.I-1). In high Class I utilization markets seasonal balancing entails obtaining milk from other areas in the short season and finding outside markets for temporary surpluses. Seasonal balancing in these markets basically

entails transporting milk from surplus areas in the fall and winter and transporting milk to areas with excess processing capacity in other times of the year (Jesse and Johnson 1985, p.11). The major cost borne by the cooperative is the cost of transporting milk.

In low Class I utilization markets seasonal balancing costs are usually highest in the fall and winter because manufacturing plants are underutilized. The per unit plant cost is highest during this time of year (Jesse and Johnson 1985, p.11). Cooperatives are often involved in managing manufacturing plants and transportation and therefore bear much of the cost of balancing supplies. Most of the costs involved with balancing seasonal supplies are a result of the costs of transportation or managing manufacturing plants (Ling 1985, p.1).

Cooperatives that undertake seasonal balancing activities save processors and handlers the trouble of finding markets themselves. In the southern region of Associated Milk Producers, Inc.'s market area it was estimated that centralizing supplies reduced needed reserve supplies by 25 percent (Keltke and Blakley, p.20). This reduces uncertainty and improves the flow of product within a market. It frees up resources that would have been used for balancing to be employed in other ways.

If an organization, such as a cooperative, did not balance supplies the market would become unstable.

Prices would rise in the short period and fall during the flush period. Seasonal balancing does not increase or decrease prices and incomes throughout a year; instead it reduces price variance within a year. The cooperative's membership, as well as other subsector participants, benefit from this reduced price variance and market stability which is the major reason why it is willing to perform seasonal balancing activities.

If a cooperative is balancing seasonal supplies, it usually must be vertically integrated into processing and manufacturing. This is particularly true in low Class I utilization areas such as the Upper Midwest. An alternative is to contract with processors to handle these surpluses but this does not appear to have occurred. In order for a cooperative to qualify for payment for its balancing activities it should probably be vertically integrated.

In order to determine the costs of balancing seasonal supplies three things must be considered. The first is to determine the amount of reserves needed for the fluid market, excess reserves (output beyond that needed for Class I use in the short season) should not be considered. The second thing needed is the costs of balancing reserves, which naturally vary from month to month (Ling 1985, p.16). The cost of balancing could be estimated either through engineering or actual cost data

(NMPF 1986, p.4). The final thing needed is to calculate the value of the reserve balancing pool so it can be deducted from the marketwide producer pool and credited to the cooperative that undertakes the balancing service (Ling 1985, p.16).

For example, assume that there is a market where on average, daily production exceeds daily fluid demand by 6.05 million pounds. Furthermore, assume that there exists two butter - powder plants that each have a daily capacity of 3.025 million pounds that balance the market. Assume each plant has the same cost structure, the same seasonal fluctuations, and they split the market evenly between each other. The total annual necessary reserves (that amount needed to ensure that the fluid market's needs are met in the short season) is assumed to be 4,202,390 hundredweight. Furthermore, it is assumed that necessary reserves are at a maximum of 1.854 million pounds per day in June and are at a minimum of .52 million pounds per day in November (Ling 1985, p.4).

The cost structure of such a plant could look like that in Table 9.

Table 9: ASSUMED ESTIMATED ANNUAL FIXED AND OVERHEAD COSTS FOR A BUTTER - POWDER PLANT WITH A DAILY CAPACITY OF 3.025 MILLION POUNDS OF MILK ASSUMING AN 11 PERCENT INTEREST RATE

Item	Assumed Present Value	Assumed Annual Cost
	(Dollars)	
Land	126,170	13,879
Building	5,046,800	555,148
Machinery and Equipment	8,831,900	971,509
Automobiles and Fixtures	252,240	27,757
Taxes, Licenses, Administration, Insurance, etc.		757,020
Total Annual Fixed and Overhead Cost		2,325,313

(Source: Ling 1985, p.6)

These are the fixed and overhead expenses borne by an organization such as a cooperative which operates a butter-powder plant. They are only an example used for explanation and should not be thought of as representing any of the case study cooperatives analyzed later. If this cooperative does not operate at full capacity because it gives up milk to ensure that the fluid market's needs are met, these fixed costs may not be fully covered. Table 10 shows the assumed fixed and overhead costs borne by this plant for balancing the seasonal reserves of a market.

Table 10: ASSUMED ANNUAL FIXED AND OVERHEAD COSTS OF BALANCING THE FLUID RESERVES OF THE MARKET

Month	Undercapacity Caused by Necessary Reserves	Fixed and Overhead Costs
	(Million lbs.)	(Dollars)
Jan.	15.128	31,860
Feb.	12.096	25,474
March	7.874	16,583
April	1.680	3,538
May	1.364	2,873
June	0	0
July	6.603	13,906
Aug.	10.850	22,850
Sept.	16.500	34,749
Oct.	18.941	39,890
Nov.	20.010	42,142
Dec.	17.205	36,234
Total	128.251	270,089

(Source: Ling 1985, p.6)

The cost of balancing is zero in June because the plant is operating at full capacity. The cost of balancing is highest in November because that is the month the organization must give up the most milk to meet fluid needs. The total cost of 270,099 dollars is the total fixed and overhead costs that are not covered because the plant is operating at less than full capacity (Ling 1985, pp. 4,6), because it surrendered milk to meet the fluid market. Again, this is only an example. These are the types of costs borne by cooperatives when they undertake seasonal balancing activities in low Class I utilization markets. It is these costs that have also led to payment issues involving cooperatives and this marketwide service.

If cooperatives are unable to recoup the costs of balancing, the performance of the cooperative along with the quality of the service may decline. Member producers will have to subsidize nonmembers who may be the source of part of the supply fluctuations. Member producers may also subsidize processors and fluid handlers whose demands vary seasonally but do not pay for the cooperative's balancing activities (Ling 1982, p.18). If these are chronic problems, the cooperative's financial strength will decline (Ling 1982, p.18) and producers may leave the cooperative.

Producers who do not belong to the cooperative providing the service, limited service cooperatives, and proprietary firms benefit from seasonal balancing but they

may not have to pay for it. They are free riders. Government intervention may be needed to insure that cooperatives do not bear a disproportionate share of the cost (Strain et al. p.xi).

3.4.3 Marketwide Information

Another service cooperatives provide that benefit other subsector participants is marketwide information. Information is data that is processed, organized, or interpreted in such a way as to improve decisionmaking (Bonnen, p.7). The demand for information is derived from its value in reducing uncertainty faced by decisionmakers (Bonnen, p.7). Those who use information will tend to underinvest in obtaining it; the value of information ex ante is unknown. It is only after the information has been utilized that its value to the decisionmaker becomes known (Bonnen, p.8).

Despite the propensity for underinvestment in information, some feel that it is one of the most valuable of all marketwide services. The NMPF believes that well informed producers will make better decisions (NMPF 1986, p.6). Participating in Federal Order hearings has also been singled out as an important task cooperatives undertake (Graf 1977B, p.2). A survey showed that marketing and outlook information was also considered to be a relatively important service that cooperatives provided (Babb, p.12).

Marketwide information improves coordination in a number of ways. Reduced uncertainty adds stability to the subsector at all levels. Furthermore, participation in Federal Order hearings leads to improved macro coordination. Information flows between a cooperative and its membership leads to good relations and sound micro-micro coordination. Also, information flows through market analysis improves micro coordination.

There are several types of information that cooperatives provide. Virtually every dairy cooperative issues an annual report which contains a message from the President and General Manager, along with a discussion of the past year's events in addition to the various financial statements. Many cooperatives also print publications such as magazines. The annual reports and other publications tend to be focused more on the cooperative's membership. There are other information services that are wider in scope.

Cooperatives analyze milk marketing problems and conduct market research. They also collect data pertaining to prices and marketing conditions and process this data into information. Data are the product of measurement or counting that represent concepts, quantities or actions. Information is data that is processed in a way that enhances the decisionmaking abilities of a particular subsector participant (Bonnen, p.7). They also determine

and propose amendments to the Federal Orders as well as participate in meetings involving the Orders. They also conduct education programs for members and nonmembers (NMPF 1986, pp.V-2,3). Cooperative management also serves as sources of expert information for the media, such as magazines, newspapers and radio. These information services tend to be high exclusion cost, joint - impact services which makes it difficult for a cooperative to recoup the costs of providing them.

3.4.4 Payment Issues

Cooperatives, in an attempt to offset some of the costs of providing these services, have negotiated over-order premiums. Milk Marketing Orders establish the minimum price that handlers must pay producers for Grade A milk (USDA, ERS 1984B, p.1). Cooperatives may negotiate prices higher than the Order minimums. These are known as over - order premiums.

Public authority has also been used to help cooperatives recover some of the cost of providing these services. The AMAA has been amended to allow those who perform seasonal balancing activities to be paid from Federal Order Pool Funds (NMPF 1986, p.I-2). Currently, there are several methods for determining seasonal reserves and for paying cooperatives for performing this service. Charges for balancing seasonal reserves should be used by the cooperative to offset the costs of transportation and

manufacturing (Ling 1982, p.15). Good performance is guaranteed if charges are based on efficient utilization of inputs (Ling 1985, p.21).

The situation for information is much the same as that for balancing. The payment should be based on the cost of providing the service. If the cooperative is not adequately compensated then performance will decline.

Public authority has also been used to help cooperatives offset some of the costs of providing marketwide information. The New York - New Jersey Federal Milk Order allows cooperatives to be compensated for this service (NMPF 1986, p.V-3). The Order explicitly specifies the activities a cooperative must perform in order to receive compensation (Market Administrator, p.23). Currently, cooperatives that qualify for payment receive 3 cents a hundredweight for providing this service which does not cover the full cost of the service.

3.5 The Role of Marketing Orders

The previous sections have outlined three coordination activities that cooperatives pursue. A common issue in each of these activities is the potential need for government involvement through changes in the Milk Marketing Orders. Cooperatives may not have the power to affect these changes on their own. Other forces, such as free riders, may disrupt the cooperative's attempts to improve vertical coordination through multiple component

pricing, supply management, seasonal balancing, marketwide information, as well as other activities.

Milk Marketing Orders and dairy cooperatives tend to go hand in hand. Cooperatives are usually the force behind the creation of Marketing Orders, and are often the force behind amending Marketing Orders. Many cooperatives operate in several Market Order regions and therefore affect several Marketing Orders. Through amendments, the Orders may be a tool cooperatives can use to affect vertical coordination.

The Orders can be amended to include MCP systems, various types of supply management programs, and payments for marketwide services. In the case of marketwide services this has already happened in some cases. Adoption of an MCP system within a given area could improve uniformity and enhance stability. All subsector participants would be treated the same. If a supply management program were made part of the Federal Order, or part of a national dairy policy, then cooperative control over a market would be improved which would make it easier for a cooperative to institute a supply management program which would effectively eliminate surpluses. If cooperatives are to effectively enhance vertical coordination through any of these activities, the Federal Milk Marketing Orders may have to be changed.

3.6 Summary

The first three chapters have outlined some vertical coordination issues facing dairy cooperatives. Cooperatives are important subsector participants. Some of the problems that make vertical coordination in the dairy subsector difficult have also been discussed. The second chapter outlined a basic taxonomy of coordination issues and activities that dairy cooperatives are involved with at the various levels of vertical coordination. The focus of this chapter has been a statement of the hypotheses, as well as a development of a conceptual framework of cooperatives in regards to three coordinating activities they undertake.

The research will attempt to determine whether or not the evidence supports the hypotheses. If hypothesis I holds, then vertical coordination is enhanced by the price signal MCP systems administered by cooperatives relay to producers and other subsector participants. The altered price signal will more closely reflect current demand conditions. If hypothesis II holds, then perhaps cooperatives can match aggregate supply and demand in a market via supply management programs. This would enhance macro coordination and affect micro - micro coordination. If the evidence supports hypothesis III, then vertical coordination is likely enhanced at all levels through the marketwide services of seasonal balancing and marketwide

information.

CHAPTER 4: RESEARCH METHODS AND CASE STUDIES

4.1 Methods

Each of the hypotheses will be tested by analyzing case studies. Case studies are useful in analyzing whether or not cooperatives can improve vertical coordination through MCP systems, supply management programs, and the marketwide services of seasonal balancing and marketwide information. This will give insight into some of the problems cooperatives have with the different activities.

Case studies provide evidence of whether or not the hypotheses outlined in Chapter 3 hold. Other research methods would be less effective in testing these particular hypotheses. Case studies enable a researcher to study an issue in greater depth than other research methods. Case studies using interviews with relevant personnel add a richness to the analysis that other research methods lack and allow a researcher to study the relationships between market participants in greater detail. A disadvantage of case studies is that one's ability to generalize is limited. Nonetheless, the best way to determine the impact cooperatives have on coordination via MCP, supply management, and the marketwide services discussed in

Chapter 3 is by studying those cooperatives that actually undertake these activities. This provides evidence that supports or rejects the hypotheses.

The case study cooperatives were selected after careful consideration. Officials at the Agricultural Cooperative Service (ACS) were contacted in order to discuss potential case studies. These discussions also helped the researcher identify relevant personnel. Most case study cooperatives were selected after an extensive review of the literature.

A wide range of personnel were interviewed in gathering the data and information needed to test the hypotheses. The researcher personally identified and interviewed the relevant personnel. Many of the interviews included the cooperative's General Manager. Additionally, some interviews included those involved with milk sales and milk procurement, as well as several Vice Presidents, and staff economists. Some interviews were also conducted with Directors of Member Services and those involved with planning and technical services. A wide range of personnel with a wide range of experiences were utilized in this research.

4.2 Selection of Individual Case Studies

4.2.1 MCP Case Studies

The case studies were selected for several reasons. Each of the three MCP case studies use premiums

or deductions for milk testing above or below a certain SNF or protein level. Two cooperatives have SNF systems; the other has a protein system. Also, each of the case studies have quality standards on somatic cell counts, bacteria counts, or both. These case studies are typical of the vast majority of MCP systems that are administered by cooperatives. They constitute a representative sample.

The case study MCP systems all operate in the Great Lakes region. It is this part of the country that has been the most affected by MCP systems. The Great Lakes region provided the widest range of possible case studies. It may also give insight into the future direction of the dairy subsector in regards to MCP systems.

Two of these cooperatives operate in highly competitive markets with a very low Class I utilization. Micro - micro coordination considerations are particularly important in these cases. The other cooperative is the largest in its market and the market has a higher Class I utilization. MCP systems affect coordination at the micro - micro, micro, and macro levels in a number of ways. Chapter 5 analyzes the case studies to determine whether or not the evidence supports hypothesis I.

4.2.2 Supply Management Case Studies

There are very few recent examples of cooperatively administered supply management programs. The Class I base program discussed in Chapter 6 is the best

known example of this type of program. This program, which was used by a cooperative in the Southwest, was eliminated 10 years ago. It is one of the few attempts to eliminate chronic surpluses in an area east of the Rockies. Micro-micro coordination is of particular importance in this case, especially as it also affected macro coordination.

The allocation program also outlined in Chapter 6 is unique. The cooperative that administers this program is based in the Northwest. It is the largest cooperative in this geographically isolated area. This program, which was initiated in 1987, is a very recent example of a supply management program. An interesting aspect of this program is its flexibility which affects micro - micro and macro coordination.

The seasonal supply management program was also one of the few administered by a cooperative in existence. Most seasonal supply management programs are part of the Federal Orders. This was not the case for this cooperative which operates in the Northeast. This program was also flexible, and was eliminated after the DTP tightened supplies in this market. This program also affected micro - micro and macro coordination.

These case studies cover the range of supply management programs both past and present. They contain much of the population that could have possibly been selected. There are very few recent examples of supply

management programs that are, or were, administered by cooperatives. Chapter 6 analyzes these supply management case studies in order to determine whether or not the evidence supports hypothesis II.

4.2.3 Marketwide Services Case Studies

The case studies used to analyze marketwide services are also representative. They cover several parts of the country and they utilize several different methods in an attempt to recover the costs of providing marketwide information and seasonal balancing. Two of these cooperatives belong to cooperative federations. Some have also attempted, or are currently attempting, to amend the Federal Orders in order to recoup some of the costs of providing these services. One cooperative is compensated through the Federal Order for providing the marketwide service of seasonal balancing and marketwide information.

One cooperative operates in a high Class I utilization area. Transportation is a somewhat more important seasonal balancing activity than operating manufacturing plants. Another cooperative also transports milk as a balancing activity. The other cooperatives do not transport milk to balance supplies. The primary mechanism they use to balance seasonal supplies is operating manufacturing plants.

All of the case study cooperatives provide a wide range of marketwide information services. These services

benefit many subsector participants. The four cooperatives chosen provide a good sample of cooperatives that undertake these services.

Marketwide services affect coordination at the micro - micro, micro, and macro levels. The issue of the free rider is particularly important in dealing with marketwide services. As a general rule, these cooperatives are placed at a competitive disadvantage because they perform the marketwide services of seasonal balancing and marketwide information. This also leads to effects on coordination. Chapter 7 analyzes each of the case study cooperatives to determine whether or not the evidence supports hypothesis III.

The number of cooperatives that pursue these activities is becoming increasingly small. Dairy cooperatives, like much of the rest of the economy, are becoming increasingly concentrated. All of the case study cooperatives are amongst the 25 largest in the country (USDA, ACS, p.9). This group of 25 handled more that half the milk produced, and their membership includes more than half of the dairy farmers in the U.S. (USDA, ACS, p.9). Cooperatives are becoming larger and more regional in nature. Market areas are also becoming larger. The case study cooperatives reflect these facts.

As a general rule, there are two reasons for selecting each of these case study cooperatives. The first

is that many of the programs have been in existence for a number of years. There is an historical base to draw upon. Secondly, most of the cooperatives chosen are leaders in their particular markets, and studying them may give insight into the future direction of the dairy subsector.

4.3 Data Collection Techniques

The questions used to gather the data were complete. Originally, a large questionnaire was developed and analyzed. From this questionnaire some questions were dropped and others were combined in order to make the interview manageable. These questionnaires were analyzed by researchers at Michigan State University, and were also checked for completeness by those actually interviewed. It was felt by all those interviewed that the questionnaires covered the major issues.

Each questionnaire followed the same pattern. The general questions served as a check to make sure that the cooperative's current operating procedures matched those found in the literature review. This allowed the researcher to update current cooperative practices and provided more factual information. Each interview then addressed micro - micro, micro (in the MCP and marketwide services case studies), and macro coordination issues in turn. These short, outline questionnaires are found in the appendix.

The researcher followed the questionnaires

closely. This ensured uniformity of responses and research results. It also ensured consistency between case studies. However, the interview process did allow for some flexibility. In some instances follow up questions were asked in order to obtain greater background information concerning individual case study cooperative practices and issues.

In order to ensure the objectivity of the responses of those interviewed anonymity had to be insured. This allowed those interviewed the freedom to be completely honest and forthcoming in their responses without fearing any repercussions from others in the subsector. Those interviewed represented a wide background and each was an expert in the issues that were addressed. They represented a good cross section of the cooperative leadership in the dairy subsector. Their views accurately reflect the current state of affairs concerning dairy cooperatives and the vertical coordination of the subsector.

Table 11 lists the number of persons interviewed by cooperative and coordination issue. Each interview can be thought of as a data point used to test each of the hypotheses. While there are not a large number of persons interviewed there are a sufficient number of degrees of freedom in each instance for a researcher to be fairly

Table 11: NUMBER OF PERSONS INTERVIEWED

Cooperative	Number of Persons Interviewed
Multiple Component Pricing	
Cooperative A	2
Cooperative B	2
Cooperative C	1
Total	5
Supply Management	
Cooperative D	2
Cooperative E	2
Cooperative F	1
Total	5
Marketwide Services	
Cooperative G	2
Cooperative H	1
Cooperative I	4
Cooperative J	1
Total	8
GRAND TOTAL	18

confident that the results and conclusions are accurate. This is especially true given the fact that there are few potential case studies to choose from and the researcher closely followed the questionnaires to ensure uniformity.

4.4 Summary

The research method used to collect information to test the hypotheses is analysis by case study. This allows a researcher to study a subsector in greater depth than other methods. Personal interviews with a wide range of relevant cooperative personnel were used to gather data. The cooperatives selected reflect a wide range of experiences.

The case study cooperatives were selected after an exhaustive literature review and discussion with members of the ACS. The case study cooperatives were useful because they provided an historical base to draw upon. They also tended to be market leaders. They represented a cross section of the country. The MCP systems and marketwide service cooperatives represent the typical experience with these issues. The supply management cooperatives represent most of the population of cooperatives which could have been chosen.

Chapters 5, 6, and 7 analyze the case study cooperatives and their experiences with MCP, supply management, and the marketwide services of seasonal balancing and marketwide information. These chapters

provide evidence which supports or rejects each of the hypotheses.

CHAPTER 5: COOPERATIVES, COORDINATION, AND MULTIPLE COMPONENT PRICING

5.1 Introduction

This chapter analyzes the case study cooperatives's experiences with MCP systems. This chapter analyzes the effects of MCP systems at all levels of coordination. At the micro - micro level, it considers the educational program the cooperative used for its membership and what feedback management received from its membership when the system was instituted. It also discusses whether or not the system is currently an issue with the membership, and if any producers left the cooperative as a result of dissatisfaction with the system. This chapter also analyzes what changes in dairy farm management practices, if any, resulted from the system.

Another focus of the research deals with micro coordination. The response of manufacturers and fluid handlers to the system, as well as altered operating procedures resulting from the system are discussed. Another issue that is analyzed is whether or not proprietary firms have attempted to obtain other sources of milk as a result of the system. Another question addressed in this chapter is whether or not cooperatives are uniquely

qualified to administer an MCP system or if proprietary firms can also effectively administer this type of pricing system.

The critical macro coordination issue addressed is the fluid market. This chapter analyzes the effects, or lack thereof, of MCP systems on the fluid market. Another macro coordination aspect of MCP systems are their effects on the seasonality of SNF or protein production. Issues, such as the cooperatives's views on making MCP systems part of the Marketing Order, and the issue of standardization of fluid milk are also addressed. Furthermore, the effects of the quality aspects of these systems are discussed.

This chapter discusses each of the three case study cooperatives in turn. The background and structure of each of the systems and their effects on the various levels of coordination are analyzed. Research findings are also included in this chapter.

5.2 Cooperative A

5.2.1 Structure of the MCP System

Cooperative A introduced the quality aspects of its MCP system before it introduced its protein premium. In fact, the quality aspects of the system are the dominant characteristics of the MCP system. This cooperative is based in Wisconsin and has members in several states. The majority of the milk produced in this area, particularly Wisconsin, is covered by some type of MCP system.

This program commenced in 1980. At the time, the premium for milk which had a plate loop bacteria count of 25,000 per milliliter or less and a somatic cell count level of 250,000 per milliliter or less was 10 cents a hundredweight. If the somatic cell count was 500,000 or less, then the premium was 5 cents a hundredweight provided that the bacteria standard was met. These premiums have slowly changed over time. Today, a producer can receive a premium for both protein and quality. The quality program is shown in Table 12. Additionally, a producer is not allowed to add water or antibiotics, and a 10 cent deduction is added if the plate loop bacteria count is 300,000 or greater. A producer is paid 10 cents a hundredweight for each .1 percent of protein above 3.2 percent if his bacteria count is 25,000 or less, and his somatic cell count is between 400,000 and 301,000. If the somatic cell count is between 300,000 and 201,000 the protein premium starts at 3.1 percent, and if the somatic cell count is 200,000 or less, the protein premium starts at 3 percent.

Table 12: COOPERATIVE A'S PREMIUMS AND STANDARDS

Premiums

Premium	Standard Plate Count	Somatic Cell Count
30 cents	15,000 or less	100,000 or less
25 cents	25,000 or less	101,000 to 200,000
20 cents	25,000 or less	201,000 to 300,000
15 cents	25,000 or less	301,000 to 400,000

Deductions

Deduction	Somatic Cell Counts
15 cents	701,000 to 800,000
20 cents	801,000 to 900,000
25 cents	901,000 to 1,000,000
30 cents	More than 1,000,000

(Source: Cooperative A's Qual PACK)

This is one of the most structured MCP systems in existence and it puts an emphasis on quality. The protein aspects of the program are fairly typical. This is an important case study because of the market this cooperative operates in; the large Class III utilization in this market makes component pricing particularly important.

5.2.2 Micro - Micro Coordination

Cooperative A operates in a highly competitive environment. Its quality and protein standards would not have been enacted without member support. In fact, when this program was first enacted in 1980, the cooperative increased its membership. This program was established before most others in the market.

This cooperative gave a considerable amount of feedback to producers through testing for bacteria, somatic cells, and protein. Producers knew the constitution of their milk and could have adjusted their management practices before the premium or deduction programs were put into effect. This testing continues. Cooperative A has a good knowledge of the constitution of their membership's milk and individual producers receive test results which allows them to discover herd problems and adjust their management practices.

Producers have changed their management practices and have reduced the level of bacteria and somatic cells in their milk. This is particularly true of

dairymen whose herds are comprised of Guernsey cows. These producers are particularly interested in the program because they benefit the most from the protein premiums. Due to the fact that the technology does not exist for a producer to vary protein in the short run, and for the most part producers grow their own feed, there has not been any change in management practices to increase the protein content of milk.

This program was never an issue with producers. Few, if any, producers left the cooperative as a result of the program. In fact, producers joined the cooperative as a result of the program. Evidently, the management of the cooperative responded to the interest of the membership and adopted the MCP system. Cooperative A also responded to the competitive nature of the market and offered the system. In this part of the country a cooperative or proprietary handler needs to have an MCP system in order to keep its membership or to secure its milk supply. However, it should also be noted that total premiums paid out to producers are greater than deductions. In order to compensate those producers that meet the requirements for protein and quality, the blend price has been reduced for all producers.

5.2.3 Micro Coordination

There are few issues with MCP systems in cooperative A's market. This cooperative feels that

manufacturers do not have any real problems with MCP systems. It should be noted that about 80 percent of the milk produced in this area goes into manufacturing uses, and the greater the protein level in milk the more cheese that can be produced. There is little, if any, reason for manufacturers to be opposed to these programs. The quality controls and protein premiums go together. Milk with a high somatic cell count also has a high protein content, but that protein is whey, which is not useful in cheese production. In order to offset this fact, there is a penalty for producers that have a high somatic cell count in their milk. It appears that manufacturers have not been adversely affected by this program.

This apparently cannot be said of fluid handlers. According to some in this cooperative, the profitability of fluid handlers has been reduced slightly as a result of these programs. Unlike manufacturers, fluid handlers do not receive any direct benefit from these MCP programs. Furthermore, due to the nature of the market, they are unable to go to other sources of milk. Due to the high Class III utilization in this market, and the fact that manufacturers as well as cooperatives offer these quality and protein premiums, fluid handlers are not in a position to find outside sources of milk. They must evidently bear some of the cost of these MCP systems or they may lose their source of milk.

The operating procedures of manufacturers and fluid handlers have not changed a great deal as a result of the program. It has been suggested that manufacturing plants have become more efficient since the program was put into effect. However, cooperative A and others may be directly responsible for this increased efficiency because it is vertically integrated into most forms of dairy products and markets them under its own brand. This increased efficiency of manufacturers and fluid handlers may be due to changes in plant and equipment as a response to the competitive nature of the market and not as a result of the MCP system.

In this market, cooperatives are not the only organizations that administer MCP systems. There is some type of MCP system administered by manufacturers as well. However, some feel that it may be the case that the market signal to producers is greater with a cooperative system because cooperatives are more responsive to producer concerns. It may be the case that the feedback between cooperative management and producers is stronger than the feedback between processors and producers. Coordination via information flows could be superior in the producer-cooperative case than in the producer - proprietary firm case.

5.2.4 Macro Coordination

The critical issue in macro coordination involves the fluid market. There is no reason to believe that the MCP system has caused any disruption of the fluid market. This is most likely due to the fact that MCP systems have become part of the market. It should also be noted that in this market area Class I utilization is only 20 percent. It is not difficult for the cooperative to meet fluid handler concerns nor is the fluid market the force in this part of the country that it is in other areas. Furthermore, the cooperative believes that the fluid standards do not have to be raised in order to ensure that the demands of the fluid market are met. It was mentioned in passing that the MCP system has improved the quality and palatability of the milk produced by cooperative A's membership. Coordination may be enhanced because of the characteristics that milk has obtained as a result of the penalties and premiums of the MCP system's quality standards.

It should be noted that manufacturers and fluid handlers have been willing to pay for the increased quality. Manufacturers, because they get an economic benefit in the form of higher yielding milk, and fluid handlers, because they have to pay in order to ensure their milk supply. Currently, fluid handlers have not faced any problems in obtaining supplies. Coordination in

manufacturing has been improved through the market signal that the MCP system sends, and there has not been any real significant change in the fluid market.

It does not appear that MCP systems have to be part of the Marketing Order in this cooperative's operating area. Most of the MCP systems in this area are very similar, and these programs started and evolved on their own. Furthermore, these systems are responsive to the competitive nature of the market and this fact has fostered uniformity amongst the different cooperative and processor MCP systems. However, it was felt that if the fluid standards were raised, MCP systems should become part of the Federal Milk Marketing Order.

There are other macro coordination issues that need to be addressed. The premium levels of cooperative A were determined by basically two things. The most important consideration was the cheese yield. The protein premium was determined primarily by the value of cheese and the amount of cheese that could be produced by milk with a given protein level. In this market, protein is the solid that has the most value. Other solid constituents are evidently not valued by this cooperative or this market. The other determinate of the premiums and deductions is competition. Competition has forced a degree of uniformity amongst the MCP systems. It should also be noted that ten cents for each .1 percent protein is easy

for producers to understand.

A problem is the seasonality of protein levels in milk. The protein content of milk is highest in the fall and winter, and the lowest in the spring and summer. So far, the MCP system has not affected this seasonality. However, producers know that this problem exists and some are beginning to analyze it. Perhaps with time, the seasonality of protein production will be reduced and the consistency of milk enhanced as a result of this MCP system. If this is the case, macro coordination would be improved as a result of a more consistent, higher yielding, product which would improve manufacturing plant productivity.

5.3 Cooperative B

5.3.1 Structure of the MCP System

Cooperative B began its MCP system in October of 1983. When first introduced, this system paid 10 cents a hundredweight for each .1 percent SNF above 8.75 percent. Currently, the SNF threshold is 8.65 percent. The premium level currently varies seasonally depending on the SNF level. The premium varies from 7 to 10 cents. The reason it varies is so that the cost of cooperative B's SNF system is approximately equal to the protein systems that are also administered in this region.

There are also several quality premiums and deductions that are administered independently of the SNF

system. Table 13 lists cooperative B's various quality premiums and deductions.

Table 13: COOPERATIVE B'S QUALITY PREMIUMS AND DEDUCTIONS

Premiums

Premium	Plate Loop Bacteria Count		Somatic Cell Count
6 cents	50,000 or less	and	300,000 to 400,000
12 cents	25,000 or less	and	200,000 to 300,000
24 cents	10,000 or less	and	less than 200,000

Deductions

Deduction	Plate Loop Bacteria Count		Somatic Cell Count
6 percent of milk check	greater than 500,000	or	greater than 1,000,000
20 percent of milk check	greater than 1,000,000		

These are fairly standard quality premiums and deductions. It should also be noted that if a producer's bacteria count tests 1,000,000 or more five times within a twelve month period the cooperative drops him.

This cooperative operates in a highly competitive market. Many cooperatives and proprietary firms administer MCP systems. The bulk of cooperative B's membership is based in Wisconsin, Minnesota, and the Dakotas. Most of its membership operates in areas that

are dominated by SNF systems, although there are also many protein systems in the area. The primary reason why the cooperative instituted the system was to meet the competition, to offer members the same type of pricing system that other cooperatives and proprietary firms offer.

5.3.2 Micro - Micro Coordination

This cooperative had little lead time before it instituted its MCP system. Producers's SNF, somatic cell counts, and bacteria counts were not tested before the cooperative instituted the system. The cooperative decided to institute the system in June of 1983 and it took effect that October. The primary method of communication between the cooperative's management and its member producers was through member meetings in the months of September and October.

There are some current issues with the system. Some members are interested in a protein rather than an SNF system. Cooperative B set its SNF threshold at 8.65 percent because it is approximately equal to 3.2 percent protein; the most common level for protein based MCP systems. Another issue with the system is that net premiums paid to producers are greater than deductions. The program does not pay for itself. Some money is deducted from the pool or blend to make up the difference. This is due to the fact that there are many organizations that administer MCP systems and if deductions were

increased then producers would leave the cooperative.

Cooperative B was somewhat late in establishing an MCP system. These programs are quite popular with producers. Cooperative B did not lose any members after instituting the system but was losing some membership before it was instituted because it did not have an MCP system. This system is based on competitive forces, not to obtain any measure of efficiency.

However, there have been some changes in production patterns as a result of the system. There has been more of an emphasis on the quality aspect of the system and somatic cell and bacteria counts have been reduced. Currently, 83 percent of cooperative B's producers qualify for quality premiums. This has led to increased cheese yields from the lower somatic cell count milk. However, it is not possible to determine the increased profitability of the cheese plants resulting from lower somatic cell counts in milk. It is difficult, if not impossible, for producers to affect the SNF level of their milk and therefore cooperative B has not noticed any change in the SNF level of producer milk.

5.3.3 Micro Coordination

This cooperative is also vertically integrated which make analysis of the response of manufacturers difficult. However, this cooperative believes that there has not been much of a response from manufacturers to the

MCP system. This is apparently due to the fact that neither the cost of milk, nor its composition in terms of SNF or protein, has been changed as a result of the MCP system. Fluid handlers have also shown no interest. This is due to the fact that high SNF milk does not sell at a premium at the retail level. There is no reward for bottling milk that exceeds FDA minimum requirements.

Furthermore, there has been no shifting of supplies as a result of this program. This is probably because much of the milk supply is already using some type of MCP system. Another reason is that manufacturers and fluid handlers do not want to lose their milk supply. There has not been any real change in operating procedures at the manufacturing or fluid level as a result of this system.

Cooperatives in this market area do not appear to be uniquely qualified to administer an MCP system. Proprietary firms which test milk could also administer such a system. However, it was mentioned in passing that cooperatives that were strictly bargaining associations would have more difficulty administering an MCP system. This is because they do not have the manufacturing facilities nor the testing facilities that vertically integrated cooperatives have.

5.3.4 Macro Coordination

There has not been a disruption of the fluid market as a result of cooperative B's MCP system. This cooperative analyzed the potential for changing hauling routes in order to give fluid handlers low SNF, high somatic cell, and high bacteria milk, but the increased cost of transportation was greater than the potential gains from manufacturing plants. Fluid handlers are receiving the same product as before with the exception that somatic cell and bacteria counts are lower as a result of the producer response to the system.

Currently, there is little incentive for fluid handlers and manufacturers to pay for the increased quality of the milk supply. However, this cooperative feels that there may be potential interest as quality standards become more stringent. Fluid handlers have become more particular, but there will be no incentive to pay a premium for high quality milk as long as milk exceeds minimum standards. It is more difficult to determine manufacturers response to quality because little, if any, of cooperative B's milk goes to proprietary manufacturers.

This cooperative is in favor of raising the fluid standards. There are several reasons for their position. The primary reason is that the uniformity and consistency of milk would improve. The seasonality of fluid milk's SNF composition would be reduced if the

standards were raised. A secondary reason is that the fluid market and the manufacturing market would be treated the same. This cooperative is not in favor of raising the standard to the California SNF level, but to the average SNF level of milk at the farm gate.

Closely allied with cooperative B's views on fluid standards is its position favoring amending the Marketing Order to include an MCP system. The two major reasons it supports amending the Marketing Orders is that the cooperative feels that it would increase uniformity of the MCP systems, and insure the integrity of the program. All participants would be treated the same. Also, if the solid standards were raised, all milk in the market would be treated the same which would also make uniformity of the MCP systems more important. Also, if the Orders were amended to include an MCP system then it would be easier to make deductions on low SNF or high somatic cell and bacteria count producers. Currently, given the competitive environment cooperative B operates in, it is not possible to equate premiums and deductions. Regulation, through the Marketing Order, can achieve this.

There are other issues that need to be addressed. The premiums and deductions are determined competitively. The levels are set so that cooperative B's system is comparable to other systems in the area. This ensures that producers do not leave the cooperative because

of the MCP system. In addition, because it is difficult, if not impossible, to change the SNF level of milk, the seasonality of SNF production has not changed.

5.4 Cooperative C

5.4.1 Structure of the MCP System

Cooperative C's MCP system took effect on April 1, 1985. For the first 6 months of the program a premium was paid to producers whose milk tested above 9.0 percent SNF, and a penalty was paid by producers whose milk tested below 8.4 percent. Producers whose milk tested between 8.4 and 9.0 percent SNF were not affected. On October 1, 1985, the neutral range was narrowed to milk testing between 8.6 and 9.0 percent SNF. Currently, the neutral range is between 8.4 and 9.0 percent in the months of April through September, and between 8.6 and 9.0 percent October through March. This takes into account the seasonality of SNF production. The neutral range makes this MCP system an interesting case study. All producers whose milk test below the lower level now pay a penalty. The premium and penalty are both 10 cents per .1 percent SNF.

There is also a penalty for producers whose milk has a high somatic cell count regardless of SNF level. If the somatic cell count is between 700,000 and 1,000,000 per milliliter a producer's milk check is deducted 10 cents a hundredweight; if the somatic cell count is over 1,000,000 a milliliter then the producer's milk check is deducted 20

cents a hundredweight. Table 14 summarizes cooperative C's MCP system.

Table 14: COOPERATIVE C'S PREMIUMS AND DEDUCTIONS

SNF Level (percent)	Premium or Deduction
greater than 9.0	10 cents for each .1 percent above 9.0 percent SNF
8.4 to 9.0 April through September 8.6 to 9.0 October through March	no premiums or deductions
less than 8.4 April through September 8.6 October through March	10 cents for each .1 percent below 8.4 or 8.6 percent SNF depending on time of year

Somatic Cell Count	Deduction
700,000 to 1,000,000	10 cents
greater than 1,000,000	20 cents

This program differs from most others in several ways. This is the dominant cooperative in the market, and it administers one of the two MCP systems in the area. The primary rationale for the system is that it increases equity to members, those who produce high SNF milk get paid more because their milk yields more manufactured product. This cooperative's system also differs from most others in that it is a zero sum game. Deductions are approximately equal to premiums paid. There has not been any effect on net producer income. It should also be noted that

cooperative C processes the vast majority of its membership's milk that is not sold to fluid handlers.

5.4.2 Micro - Micro Coordination

This system has not been a major issue with the membership. In the fall of 1984, cooperative C began testing the SNF content of its membership's milk. In January and February of 1985, the cooperative obtained member feedback and discussed application of the system through local member meetings with producers. In March of 1985, the program was voted in by the membership. Since its inception, the MCP system has not been a major issue with the membership. A rough estimate is that only about two tenths of one percent of the membership left the cooperative as a result of the system.

This may be due to several reasons. Over 70 percent of the producers fall within the neutral range. The MCP system has not altered the paycheck of the majority of producers. Furthermore, the lower boundary of the neutral range varies seasonally which reduces the number of producers that would face deductions if the lower level was held fixed at 8.6 percent SNF throughout the year. Also, the cooperative's management was responsive to member concerns, management was willing to let producers adjust the program in addition to letting them vote for the program. This makes the program less controversial with the membership.

There has been a dramatic decrease in the somatic cell counts for the average member farm. This has been the greatest change in milk composition as a result of the system. When the somatic cell count program was first instituted, the average somatic cell count per member was 450,000. That has fallen to below 300,000. Currently, the average somatic cell count is approximately 100,000 less than the previous year. This cooperative does not have a bacteria deduction or premium and therefore it cannot be determined what effect, if any, there has been on bacteria levels. As is the case with cooperative B, there has been no change in the SNF content of the membership's milk.

5.4.3 Micro Coordination

Cooperative C's MCP system has also had little effect on micro coordination. This system is funded internally and the cooperative manufactures all the milk that it doesn't sell to fluid handlers. However, this cooperative has entered into a joint venture with a large cheese manufacturer and is going to subject the manufacturer to the MCP system. The manufacturer will pay the cooperative extra for milk that contains more than 9.0 percent SNF, and the cooperative will charge less for milk that contains less than the threshold of either 8.4 or 8.6 percent SNF depending on the time of year. The manufacturer will pay less for milk that yields a comparatively low amount of cheese. Its net profitability

is not likely to be affected as a result of this system.

There are other micro coordination issues that need to be considered. Manufacturers and fluid handlers have not gone to outside sources of milk. Cooperative C manufactures its own milk and does not discriminate against fluid handlers. Also, if a proprietary handler so decided, it could administer an MCP system. In fact, this cooperative feels that it may be easier for a proprietary plant to administer an MCP system because it is less responsive to producer concerns. However, it should again be stated that cooperative C is one of only two organizations in the market area that administers an MCP system.

5.4.4 Macro Coordination

Cooperative C's MCP system has not affected the fluid market. The cooperative has not changed its pricing practices towards fluid handlers. Also, it would be too expensive to change the cooperative's shipping schedule so that fluid handlers would receive low SNF or high somatic cell count milk. If anything, the quality of milk fluid handlers receive has been improved as a result of producers reducing the number of somatic cells in their milk. However, fluid handlers have not been interested in milk which exceeds FDA requirements and are not particularly interested in paying for high quality milk. Manufacturers's response is more difficult to determine

because cooperative C processes its own milk.

The cooperative strongly supports raising the solid standards for fluid milk. This would mean that fluid handlers would either have to purchase milk powder and other milk constituents to raise the standards or directly purchase high SNF milk from the farm itself. Should this occur, cooperative C will eliminate the neutral range and treat SNF in exactly the same way butterfat is treated now. However, this cooperative believes that the solid standards will not be adjusted anytime in the near future.

Raising the standards will have effects. Prices will rise, but the cooperative believes that consumers will not notice the difference and there will be little, if any, change in consumption. Implicit in this argument is the belief that the demand for fluid milk is extremely inelastic, perhaps to the point that the demand curve is vertical. More likely there will be a small, but noticeable, decrease in the quantity demanded if the solids standards are raised and if consumers do not value milk with a high SNF content more than milk with a comparatively low SNF content. It should be noted that raising the standards creates a potential market for milk powder, and should consumption decline as a result of the higher price, the cooperative feels that demand can be increased through advertising and promotion.

It follows that should the standards be raised,

then the Marketing Order should be amended to allow for an MCP system. Cooperative C is one of two market participants in its operating area administering an MCP system, and equity would be enhanced if it were made part of the Order. If an MCP system were made part of the Marketing Order uniformity in the market would be improved.

There were two reasons why the premium and deduction levels for SNF were chosen. The first is that 10 cents per .1 percent SNF is an easy figure for producers to understand. Since it is easy for members to understand, micro - micro coordination is not adversely affected. Also, 10 cents per .1 percent SNF is an average return; the value of high SNF in fluid milk is zero but the value of high SNF milk is more than 10 cents per .1 percent SNF in manufactured products. It should be noted that the seasonality of SNF production has not been affected by the system.

5.5 Findings

The effects of MCP systems on the vertical coordination of the dairy subsector has been minimal. Hypothesis I holds in that producers have adjusted to the altered price signal and the quality of the milk supply has improved which has increased the technical efficiency of manufacturing plants. More manufactured product, especially cheese, can now be produced because of the altered nature of the milk supply. However, as a general

rule, these systems were not instituted as an attempt to meet the shift in consumption towards cheese, but as a response to the interest of dairy producers. Micro - micro coordination is improved.

These programs are very popular with producers. The testing that occurs on a regular basis improves information flows between the cooperative's management and membership which enhances micro - micro coordination. Producers have responded to these systems by reducing the level of bacteria and somatic cells in their milk. This program has increased the membership of cooperative A and is not an issue with the membership.

Cooperative B's system was basically instituted because other cooperatives and processors have MCP systems. It was instituted to meet competition. Although there was little direct membership education and feedback there have not been any serious membership problems. This may be due to the fact that MCP systems have been in existence in this area for some time and producers were probably already aware of them.

Contrary to cooperatives A and B, cooperative C's system did not receive a great deal of member support. However, it has never been a major issue with producers. Cooperative C did give the membership several months to analyze the program and to determine their SNF content and somatic cell count levels before the system was

instituted. This likely helped ensure member acceptance of the system. Most of cooperative C's membership fall within the neutral range and the somatic cell counts for most producers are below the penalty levels. Unlike the other systems, cooperative C's MCP system is close to a zero sum game with deductions and premiums being almost equal.

The reason that the program was instituted was so that producers whose milk had a high SNF content received more than those whose milk had a low SNF content. The management of this cooperative believes that using an MCP system is a more equitable method of determining a member's net price. Since this cooperative is the dominant one in the market, it has apparently been able to administer its MCP system with a minimum of controversy or disruption.

Cooperatives A and B operate in markets with a high Class III utilization and a low Class I utilization. Manufacturers have not been adversely affected by the program. They reap benefits from the MCP systems in this market. The quality of the milk supply has improved which has led to some increase in the per hundredweight productivity of processing plants. Fluid milk is still the most profitable outlet for milk and it is too expensive to differentiate high and low quality milk and ship the low quality milk to fluid handlers. MCP systems have not developed into a problem for fluid handlers.

Some cooperatives are in favor of amending the Orders and increasing the solids standards for fluid milk. If the fluid standards were raised, and the Marketing Order amended, several things would happen. All the milk in the market would be treated the same way; uniformity would be enhanced because there would be only one MCP system that would affect all market participants. Product uniformity would also be improved if the solid standards were raised. The uniformity would prevent MCP systems from becoming a pricing gimmick used by cooperatives to increase or maintain its membership. Currently, in many areas, this is the case. Furthermore, if an MCP system is made part of the Federal Milk Marketing Order, premiums and deductions would be equalized; pool funds would no longer be needed to help pay for the system. Currently, competitive pressures in cooperative A and B's markets do not allow this to happen.

Cooperatives have been leaders in administering these systems. However, all three case studies feel that cooperatives are not the only participants which could administer an MCP system. Nonetheless, because of their unique relationship with producers, cooperative systems may be more responsive and administered with more integrity than MCP systems administered by other market participants.

5.6 Summary

This chapter analyzed the effects of MCP systems administered by dairy cooperatives on the vertical coordination of the subsector. Three case studies were selected and the relevant personnel were interviewed to obtain the information needed to test the hypothesis. MCP systems do not have a great effect on the subsector. The improved quality of the milk has improved the technical efficiency of manufacturing plants. More product can be produced from the same amount of raw milk. This improves the welfare of those who operate manufacturing facilities.

It appears that hypothesis I does hold. The primary reason these programs were instituted was to appease the cooperative's membership. Enhanced coordination at the micro and macro levels as a goal per se is less important to the cooperative. As a general rule, the push for an MCP system came primarily from producers. This has enhanced micro - micro coordination. MCP systems have not changed SNF or protein levels to meet current demand conditions. Currently, this is not technically possible. The added costs of changing breeding and feeding practices are not offset by the protein or SNF premiums.

However, micro and to a lesser extent, macro coordination has been enhanced because the quality of the milk supply has improved. Manufacturers are getting a higher yielding product and others along the marketing

chain are getting a higher quality product. Coordination would be improved if these systems were made part of the Federal Orders.

CHAPTER 6: COOPERATIVES, COORDINATION, AND SUPPLY MANAGEMENT

6.1 Introduction

This chapter analyzes the impacts on vertical coordination at the micro - micro and macro levels of supply management programs administered by dairy cooperatives. At the micro - micro level, the issues of member education and feedback are addressed. Transfers of base, or allotment are also considered. The critical micro - micro coordination issue analyzed is whether or not the cooperative lost or limited its membership and the effects of the program on nonmember production.

The research also addresses a number of macro coordination issues. It analyzes the effectiveness of the programs in reducing price and output fluctuations as well as determining whether or not the overbase or overallocation price is, or was, low enough to discourage production. Each program is also examined to see if it was flexible to changing market conditions, especially changes in demand. The research also analyzes the potential for amending the Orders to include a supply management program. The question of whether or not the cooperative had enough control over the market to

effectively administer its program is also addressed.

This chapter discusses each of the three case study cooperatives in turn. The structure of the programs and their effects on coordination at the micro - micro and macro levels are analyzed. Research findings are also included.

6.2 Cooperative D

6.2.1 Structure of the Program

Cooperative D began its supply management program January 1, 1987. The primary goal of this cooperative's program is to control production increases in order to prevent the construction of additional plant capacity whose only potential buyer is the CCC. Given the uncertainty of future government policies, cooperative D has decided to control production.

This cooperative's market is separated from other sources of milk by mountains (Johnson, p.1), which gives this cooperative a considerable degree of control over the market. It is also the dominant source of milk in the area. The cooperative, whose members are based in Washington and Oregon, assigns a monthly allocation to each producer. The allocation is the highest weighted average month of production from May through October of 1985, but if a month from the period of November of 1984 through April of 1985 was the highest production month then that became the producer's monthly allocation. This rule

attempts to account for the seasonality of production. It was later determined by the cooperative's management that each producer's allocation be increased 10 percent. The allocation is not transferable and has no value. However, transfers of allocation can occur if the entire operation is transferred to a family member or if the farm is sold to another cooperative member producer.

This program was first considered before the DTP was instituted. This cooperative's volume was reduced 13 to 14 percent as a result of the DTP; this fact led to several changes in the mechanics of the program. The overallocation price was increased from 3 dollars a hundredweight to 1 dollar below the price for milk produced within the producer's allocation. Also, as noted, the cooperative increased each producer's allocation 10 percent.

There are other aspects of the program worth noting. The assessment for overallocation milk applies only in the months of April through August. New producers can be allowed to join the cooperative if it increases the cooperative's market share or if the added production does not lead to production greater than the total output ceiling set by cooperative D. Finally, an Allocation Review Committee has been established to handle member issues and problems, including recalculation of allotments.

This is a good case study because it is a recent

supply management program and it is interesting to discover some of the problems and issues the cooperative is facing. Furthermore, it is one of only two allocation or quota programs currently operating in the country. Also, it is one of the few supply management programs ever that does not allow the buying and selling of production allotments or quotas.

6.2.2 Micro - Micro Coordination

This cooperative spent a considerable amount of time obtaining member opinion and educating the membership about the program. Before the DTP, the cooperative believed that overproduction would be a problem. It sent a survey to the membership, the results of which indicated that given their future plans for production, surpluses would result. In reaction to this, cooperative D conducted member meetings which laid out the allocation program. The cooperative also held a nonbinding advisory vote in which 75 percent of the producers voted in favor of the program. The membership also helped develop the program, they were instrumental in the organization and implementation of the program.

The member - management feedback encouraged the implementation of the program. The communication flows between the management and producers led to the same point of view concerning supply management. Also, this cooperative lost few, if any, producers as a result of this

program. This program has not adversely affected management - producer relations.

This cooperative's market share has yet to be reduced as a result of the program. There has been little, if any, increase in nonmember production since the program was instituted. Cooperative D is also willing to accept new members. This has the advantage of reducing the incentive of new producers not to join the cooperative and helps the cooperative maintain its market position.

An interesting aspect of this program which has definite micro - micro coordination impacts is the Member Allocation Review Board which is composed of member producers. The committee hears producer petitions concerning allocations and is flexible enough to meet member needs. The Board is popular with producers; it gives individual producers a voice in the program and allows them to appeal their allocation levels. The Board is another way that member issues can be addressed and is another form of feedback. It also supplies a mechanism that reduces the possibility of the farm structure of the membership becoming fixed.

An unique aspect of this program is that the allocations are not transferable, and therefore they have no value. There are several reasons why the cooperative's management is strongly opposed to making the allocations transferable. The first reason is that if allocations were

transferable they would become an asset with value. This would make the program difficult to modify, any change in the program would change the value of the asset, and therefore any modification of the program would meet with member resistance. The cooperative would also face the problem of members selling their allocation and marketing their milk to other cooperatives or handlers. Supplies would increase, and the cooperative would lose some of its market control. This would defeat the purpose of the supply management program.

Also, if the allocations became transferable it would be difficult for new producers to join the cooperative. The only way a new dairyman could join would be to purchase allocation. This would create a barrier to entry. More likely, new producers would not join the cooperative which would reduce the cooperative's control over the market.

Most of the membership supports the nontransferability of allocations. Currently, all allocation reverts back to the cooperative when a producer stops marketing milk. However, the cooperative is very generous with giving the allocation to a family member in cases of death or retirement. However, there are some producers who favor making the allocations transferable because it would create a valuable asset.

6.2.3 Macro Coordination

Cooperative D's overallocation price is only one dollar less than the allocation price and this assessment is only in effect from April through August. The overallocation price is currently not low enough to completely eliminate the incentive to increase production but the flexibility of the program does discourage increased production. There is always the risk that the assessment for overallocation milk may increase. This serves as a disincentive for producers to make investments in more dairy livestock, plant, and equipment, and keeps increases in total production at a minimum. Again, the DTP reduced the need for a high overallocation assessment because much of this cooperative's membership stopped producing milk.

This cooperative currently believes that it has sufficient control over the market to successfully administer its supply management program. This market is geographically separated from other sources of milk. Also, this cooperative pays its producers higher prices than other market participants. Its control is enhanced because if a member left the cooperative his profitability would probably be reduced. There are also few other cooperatives in the area, there are few alternative outlets for milk besides this cooperative. Cooperative D also attempted to get other cooperatives to become part of a

supply management program but it was unsuccessful, there was too much resistance from other cooperatives. The cooperative also realizes that it would be more difficult for its supply management program to be successful if its market share were smaller.

Cooperative D does favor making supply management part of the Federal Order. The primary reason the cooperative supports making supply management part of the Federal Order is it would provide a "level playing field"; this would prevent cooperative D's producers from being the only group committed to managing supplies. It would prevent those producers who don't belong to cooperative D from increasing their profitability and market share at the expense of the cooperative's producers. There is also some interest by some in the cooperative in a national supply management program. The total national allocation would be based on total plant capacity and aggregate demand.

There has been little effect on prices or output as a result of this program. This is likely due to the fact that this program has only been in existence since January of 1987. There has been a decline in production but it is difficult to determine the cause for this. The allocation program has likely curtailed any potential future supply increase, while the program hasn't stopped some dairymen from increasing production, it has slowed it down.

The cooperative has not had time to study the possible effects the program may have on seasonality of production. However, at the current time, there is no penalty for producing more than one's allocation in the fall and winter. This aspect of the program will likely lead to reduced seasonality of production.

One of the overriding aspects of this program is its flexibility. The cooperative would match any increase in demand by increasing its allocation to producers. This cooperative would also decrease producer allocations if market conditions warrant it. The cooperative's management is also aware of potential member problems if allocations are reduced, producers are less likely to protest an increase in their allocation than a decrease. Cooperative D would adjust individual allocations on a case by case basis. It is felt that there would be too much wasted or unused allocation if it were increased to each producer at a flat rate.

The cooperative is also aware of the pitfalls of flexibility. The program could be changed in a manner that reduces the effectiveness of the supply management system. Examples of this would be: increases in allocations beyond that dictated by market conditions, subjective changes in individual allotments, or refusing to increase allotment in times of increasing demand. These problems would make supply management a less effective tool of macro

coordination.

6.3 Cooperative E

6.3.1 Structure of the Program

This cooperative attempted to control surpluses through the use of a Class I plan. This program was instituted when the cooperative came into existence as a result of several mergers. Their program was supported by Mid American Dairymen, Inc. which is a very large regional cooperative. This program commenced in 1968 (Riley, Childs, and Blakley, p.2), and was discontinued after a producer referendum in 1978.

A producer's Class I base was determined by using the following method. The higher of the twelve monthly production figures of 1966 or 1967 was determined. This amount was divided by 365 in order to determine a dairyman's daily production. This amount, in turn, was reduced by the approximate Class I utilization rate (Riley, Childs, and Blakley, p.2). This amount became the producer's daily Class I base. If a dairyman's production history was not as long, a shorter time period was used (Riley, Childs, and Blakley, p.2).

Obviously, this program attempted to match marketings to Class I utilization. The goals of this program were to control production growth and therefore maintain a high Class I price. Another goal was producer equity, if one producer decided to increase production,

other producers retained their Class I share. Also, this program attempted to reduce the seasonality of production. Production within the base received the Class I price and any excess production received the manufacturing grade price. The bases assigned varied from division to division depending on the Class I utilization within that particular area.

This program was successful in stabilizing the market because those producers who operated under the program reduced their marketings (Phillips and Babb, p.26). However, many new producers elected not to enter the program (Phillips and Babb, p.26). The cooperative could not force producers to join. Over time, the cooperative lost market share which made it more difficult for the program to be effective.

The bases were transferable. This allowed producers under the program to increase their operations by purchasing base (Phillips and Babb, p.26). There was also a base committee which was given the authority to transfer or increase bases in instances where bases were not being utilized or if a producer warranted an increase in his base as a result of some type of hardship (Blakley, p.6).

Cooperative E's program was an example of a Class I plan instead of a quota. Why it no longer exists makes a good case study. This is also a relatively recent and rare example of a cooperative's attempt to administer a supply

management program to reduce chronic surpluses east of the Rockies.

6.3.2 Micro - Micro Coordination

This cooperative instituted its supply management program when it was created as a result of several mergers in the market area. Many of the producers had previously operated under some type of supply management program before the mergers occurred. Many producers understood how these types of programs operated. The primary mechanism of educating and informing the producers about the Class I program was through member meetings. Less important methods of education and sources of information were member publications and individual producer contact with fieldmen.

When the program was first instituted several problems had to be solved. At the time the program was instituted there was a great deal of producer apprehension, although the great majority of producers accepted the plan. A divisive issue within the cooperative was how the bases were divided amongst producers and within geographic divisions in the cooperative's various market areas. Another issue was hardship cases; the cooperative allowed individual producers to appeal their base allocation and when the appeals board agreed, his base was increased. Other problems were member relations, administering base transfers, and various personality problems that were a natural result of the mergers. These problems were

evidently solved because member acceptance of the program improved after the program came into existence. It can be deduced from the issues listed above that there was sufficient member feedback to address various member concerns.

Over time, the cooperative's control over the market declined. Some members left the cooperative as a result of the program, for the most part these producers did not join another cooperative but became independent. These producers could obtain a higher income for producing as much as they wanted outside of the cooperative's program. They received the blend price for all their milk outside of the cooperative. Also, due to the fact that the bases had value, new producers did not join the cooperative. The cost of purchasing base created a barrier to entry. In order to increase the number of producers in the cooperative, it offered plans to make it easier for new producers to join the cooperative. While some new producers did join the cooperative, some of the effectiveness of the program was lost as a result. Also, new producers were allowed to build base. Despite these incentives, the cooperative feels that it did not get the new production it would have otherwise obtained.

Another reason why cooperative E's market share declined was the fact that nonmembers increased production faster than member producers. There was no penalty for

increasing production, nonmembers continued to receive the blend price. The burden of keeping surpluses at a minimum fell on the members of the cooperative. Nonmember producers gained more from the cooperative's program than members.

Increased nonmember production led to an increase in the amount of milk outside the control of the cooperative. It appears that nonmember producers were free riders. They benefitted from the cooperative's attempt to reduce the surplus but they faced no penalty for increasing production. This loss of control varied from division to division. For example, in one division the cooperative's market share declined from 80 percent when the program was introduced, to 50 percent when the program was eliminated.

Bases were transferable between members, the cooperative had little control. Both the buyer and seller signed an agreement and submitted it to division headquarters. Bases could not be transferred between divisions; for example, a Kansas producer could not sell to a Texas producer. The base price varied from division to division, it basically varied with the Class I differentials. As a general rule, the price of base varied from 5 to 15 dollars a pound. The program apparently did not serve as an incentive for high cost producers to leave the market. Technical efficiency was neither enhanced nor

inhibited as a result of the program.

When a producer sold base and quit the cooperative he was not allowed to continue marketing milk independently. There was a 5 year noncompete clause. This clause was tested in court several times and the cooperative was successful in preventing producers from selling base and marketing milk independently as a nonmember producer. However, the cooperative believes that it was far from completely able to force producers who sold their base from leaving the market.

6.3.3 Macro Coordination

The cooperative's overbase price was not low enough to completely discourage overproduction. The overbase price of milk was basically the M-W. The effectiveness of this price being low enough to discourage surpluses varied from division to division, in some areas it did provide a sufficient incentive to curb production, in other areas it was not. Also, had the overbase price been any lower it would have encouraged producers to leave the cooperative. Cooperative E lacked sufficient control to ensure that the overbase price of milk would be low enough to completely eliminate surpluses.

The cooperative feels that the program was successful in adding stability to the market. A producer's daily base was not seasonally adjusted. Producers reacted to this by changing their breeding habits

so that cows freshened at a more uniform rate. Seasonal fluctuations were reduced. If a producer did not produce equal to his base in the fall he could not make it up. If he produced in excess of his base in the spring then he received a lower price for the excess production. This provided the incentive to produce at a uniform level throughout the year.

The cooperative feels that the Marketing Order is not the tool to use in instituting a supply management program. This is because too much milk, such as Grade B milk and all the milk produced in California, is not under the Federal Milk Marketing Order system. In order to have sufficient control, a supply management program must be nationwide in scope. However, the Orders could be used for the administration of the program, perhaps under the auspices of a federal bureaucracy such as the ASCS. This cooperative is in favor of a national supply management program.

This program was too flexible. Cooperative E increased producer bases at a faster rate than fluid milk demand. This is also a reflection of the lack of market control the cooperative faced. If the cooperative had sufficient control, it would have increased the total producer base to exactly meet increases in demand. Increasing member prices was not the goal of this program.

This cooperative probably crippled its chance to

effectively support a supply management program at its inception. When the cooperative was created, it established a 50 cents a hundredweight over - order premium on Class I milk in an attempt to be compensated for balancing and other marketwide services. This over - order premium encouraged processors and fluid handlers to obtain other sources of milk. This combination of processors and fluid handlers looking for another source of supply and the increase in nonmember production destroyed whatever ability the cooperative may have had in managing supply.

This lack of control was the downfall of the program. Due to production outside of the cooperative's control, and processor and fluid handler unwillingness to pay the over - order premium, the cooperative was unable to administer the program. The continual deterioration of market share led to a reduction in the value of bases and made the elimination of the program via a producer referendum simple. However, while this program was in existence it did serve to reduce surpluses.

6.4 Cooperative F

6.4.1 Structure of the Program

This cooperative's supply management program was different from the other two in that its goal was to reduce seasonal fluctuations in supply. The basic rationale for this program was to reduce costs. In order to handle the seasonal surplus, the cooperative had to lease a

manufacturing plant from another cooperative; the cost of transporting and manufacturing this excess milk was 1.60 dollars a hundredweight. The cooperative decided to save costs by instituting a base - excess plan to reduce the seasonal surplus which would eliminate the need for leasing the manufacturing plant.

This cooperative was formed in 1980 and it approved its base - excess plan in 1981. The winter of 1981 was the first base forming year and the spring of 1982 was the first excess year. The program itself began in 1983 and the results were startling. The difference between March through June, the flush production period, and August through November, the short production period, was 11.3 percent in 1981 and it was only 5.5 percent in 1983. The Diversion and the DTP programs make analysis of 1984 and 1985 difficult, but the seasonal fluctuations were still less than before the program was instituted. As a result of the Diversion and the DTP, supplies tightened and the cooperative decided to end the program in the spring of 1987.

This cooperative operates in an interesting market area. Other cooperatives in this area also operate independent base - excess plans and there is a "Louisville plan" in the Federal Order. The base price tended to be 10 to 12 cents a hundredweight above the blend price and the price of excess milk was usually 1.10 dollars below the

blend price, although it sometimes was as much as 2 dollars below the blend price depending on market conditions. The bases had no value because a producer formed a new base every year.

This cooperative makes a good case study for a number of reasons. It attempted to improve vertical coordination by making production more uniform throughout the year. Membership issues make this an interesting case study as well. Also, this cooperative lacks the market power to administer any type of quota or allotment program even if it so desired.

6.4.2 Micro - Micro Coordination

As a general rule, there was member support and acceptance of the program. The membership realized that they bore the cost of leasing the plant and transporting milk. This provided a strong incentive to institute a base - excess plan. The membership was educated through member meetings and through the cooperative's member publication.

However, there were some problems with the program. Those producers whose milk production exhibited the greatest seasonality tended to be opposed to the program. These producers tended to be located in the northern part of the cooperative's area which led to some regional difficulties. Also, those producers who had a relatively constant level of production throughout the

year did not particularly favor the program's elimination.

Producers were given the opportunity to comment on the program. The cooperative's annual producer meetings provided a forum for member feedback. This cooperative also conducted a member survey in an attempt to discover producer opinions about the program. Another way members were able to interact with the cooperative's management was through their representatives who are elected by the membership. It appears that although there were some producer issues, the relations between the membership and management were not adversely affected by either the program's initiation or elimination. Good communication probably enhanced the membership's support of the program.

However, some producers did leave the cooperative because of the program, although there were no effects on nonmember producers. Cooperative F did not lose membership to other cooperatives because they also administer base-excess plans. Instead, it lost some membership to proprietary firms. Those producers who left the cooperative tended to have the highest seasonality of production. One of the major reasons why the cooperative ended its program was that it was in danger of losing more producers to proprietary firms because supplies had tightened as a result of the DTP. This program, because it is a weak form of supply management, had no effect on the production patterns of nonmember producers.

6.4.3 Macro Coordination

The price of excess milk tended to be a little over a dollar less than the blend price. This apparently was low enough to reduce the seasonal fluctuations in production. This cooperative believes that the program likely worked on perception rather than actual financial effects; in the minds of producers, the lower price for excess milk provided an incentive to reduce production in the spring which was the goal of the program. Producer adjustment depended on their seasonality, the greater the seasonal fluctuation before the program came into existence the greater the reduction in the seasonality of production after the program came into existence.

When the cooperative administered the program it felt that it did have sufficient control to effectively reduce seasonal supply fluctuations. However, as supplies were curtailed due to other factors such as the DTP, other markets became available, there were alternatives. Also, there was increased plant capacity available which made handling spring production less expensive. Had the cooperative not eliminated the program, it would have lost members and control would have been reduced. Cooperative F was adaptable to changing conditions and it eliminated the program when it was no longer needed.

The purpose of the program was to match seasonal supply with seasonal demand. It was successful in reducing

seasonal supply fluctuations. There was no effect on price fluctuations. Other base - excess plans in this market area have also reduced seasonal supply fluctuations. In this respect the plans have enhanced macro coordination.

The cooperative is in favor of making a base-excess plan part of the Federal Order. Currently, there is a "Louisville plan" in this market but it is felt by the cooperative that a base - excess plan is more effective because the effects of the program are directly evident in a producer's milk check. Some cooperatives are in favor of having this type of plan in the Order, other cooperatives are opposed. The largest cooperatives, which administer their own base - excess plans, favor amending the Order. This would likely add uniformity to the market, and ensure that all producers would be affected by seasonal fluctuations in milk production.

Cooperative F faced a number of other issues. Originally, the base forming months were from September through December. However, market analysis showed that August through November was a better time period because of milk needs in August and because of the holiday season in December. A compromise of August through December was finally reached. Another issue was the price of excess milk. Originally the price of excess milk was the M-W, it was later adjusted upward because of zone differences within the order. A disproportionate cost was borne by

those producers who were located close to the major milk markets, therefore the price of excess milk was increased.

6.5 Findings

Coordination can be enhanced by supply management programs administered by cooperatives, they can reduce both seasonal and chronic surpluses. Hypothesis II holds if the cooperative has sufficient control of the market. Technical efficiency is enhanced because fewer resources are devoted to manufacturing plants needed to process excess milk. Macro coordination is also improved through the enhanced stability that results from the reduced seasonality of production. Also, these programs directly enhance macro coordination by effectively matching supply with demand. A great deal of control is needed to administer a program designed to curb chronic surpluses.

These programs had the support of the membership. In one instance, the cooperative spent a great deal of time educating and interacting with the membership. The other two cooperatives spent less time interacting with the membership because producers had some understanding of these types of programs. Cooperatives D and E provided producers a method to increase the amount of milk they were allowed to market through an appeal process.

Micro - micro coordination was enhanced through these programs. The management of the cooperatives listened to producer concerns and adjusted their programs.

Communication flows were sound. Cooperative E was particularly responsive to the concerns of its membership. This was partially due to the fact that producers had alternative outlets for their milk.

A micro - micro coordination issue is the transferability of bases or allotments. Some producers are in favor of creating a valuable asset by making bases or allotments transferable. However, this creates a barrier to entry and makes it less likely that new producers will join the cooperative. If bases or allotments are transferable the cooperative administering the program will lose market control over time.

These programs were successful in meeting their goals. Cooperative D has not been forced to build manufacturing plants to process their membership's milk. Cooperative F did not have to lease processing plant to handle their membership's seasonal flush. The surpluses in cooperative E's market area were curbed as a result of its Class I program. Macro coordination was enhanced by the case study cooperatives's achieving their goals.

Another aspect of these programs was their flexibility. Cooperatives E and F eliminated their programs. Cooperative E because their market position was eroding and cooperative F because the DTP tightened supplies in its operating area. All the cooperatives showed the ability to adjust their programs to meet

changing supply and demand conditions. This flexibility also leads to enhanced macro coordination.

The critical condition that must be met in order for a supply management program to be effective is market control. Less control is needed to effectively administer a seasonal program. A great deal of market control is needed if a cooperative is to curb chronic surpluses. A cooperative must be the dominant source of milk in a geographically separated market to administer a quota, allocation, or Class I program. A cooperative cannot curb chronic surpluses east of the Rockies. If it attempts to do so, nonmember producers will increase production, they will benefit from the cooperative's program without having to reduce their production. The cooperative will lose market share as a result.

This fact has policy consequences. Base - excess plans are part of many Federal Orders to reduce seasonal supply fluctuations. All of the cooperatives are in favor of making supply management part of the structure of the dairy subsector. It appears that the only way chronic surpluses can be reduced is through some type of national program, the Federal Orders are too limited in scope to be the effective institution to manage supplies on an interyear basis. Cooperatives could be given the authority to administer the program. Whether or not dairy surpluses should be reduced through a supply management program is a

decision society as a whole must make.

6.6 Summary

This chapter focused on dairy cooperatives's experiences in administering supply management programs. Information was gathered through interviews with various officers of the case study cooperatives. These programs have, or at one time had, a positive influence on vertical coordination.

Hypothesis II holds. Cooperatives can enhance coordination via supply management programs. As a result of these programs, surpluses, both seasonal and chronic, were reduced. Stability was also enhanced through reduced seasonal fluctuations in supply. This directly enhanced macro coordination. Furthermore, fewer resources were needed to operate manufacturing facilities to process the excess milk. This enhanced technical efficiency.

At the time they were instituted, these programs were popular with the membership. Two cooperatives have, or did have, a review board to deal with producer problems. One cooperative conducted an intensive education program and received a great deal of member feedback. The other cooperatives spent less time educating and informing their membership because producers were aware of how these programs worked. However, communication between producers and management was important in all three cases.

There are two important issues involving these

programs. These programs were very flexible, the cooperatives adjusted these programs in order to meet changing supply and demand conditions. In two instances they eliminated the program. This flexibility, as a general rule, enhanced coordination. The other issue is control. A cooperative needs a great deal of market control in order to curb chronic surpluses. Less control is needed to administer a seasonal supply management program. No cooperative east of the Rockies possesses this degree of control in its market, there is not sufficient isolation from other sources of milk. National dairy policy must be amended if surpluses are to be reduced through a supply management program. Either a nationwide quota, Class I, or allotment program is necessary to curb chronic surpluses.

CHAPTER 7: COOPERATIVES, COORDINATION, AND MARKETWIDE SERVICES

7.1 Introduction

This chapter analyzes the four case study cooperatives's experiences with providing the marketwide services of seasonal balancing and marketwide information. The effects of these services on micro - micro, micro, and macro coordination are studied. The first part of this chapter deals with seasonal balancing, the second part of this chapter analyzes marketwide information.

There are several micro - micro coordination aspects of these services that need to be considered. Since these services have public good characteristics, the cooperatives may need the support of the membership in order to perform them. The cost of these services to the membership is discussed. Also, various producer free rider problems are addressed. Another question that this chapter analyzes is the various ways that marketwide information improves the decisionmaking abilities of producers.

There are several micro coordination aspects of seasonal balancing and marketwide information that are analyzed. The question of the effects on the subsector if

the cooperative stopped providing these services is addressed. Another issue faced by cooperatives that perform these services is the potential for proprietary firms to be free riders, to benefit from the activities pursued by the cooperative without sharing the cost. An example is the potential enhanced decisionmaking abilities of proprietary firms which result from the marketwide information services provided by the cooperatives without the proprietary firms sharing the cost.

Compensation issues dominate macro coordination. Questions concerning how cooperatives should be compensated are addressed. Possible changes in behavior as a result of changes in the way cooperatives are compensated for these services are discussed. The question of marketwide information's role in improving the match between aggregate supply and demand is also analyzed. Research results are also included in this chapter.

7.2 Seasonal Balancing

7.2.1 Cooperative G

7.2.1 a Background

This cooperative has attempted to be compensated for the marketwide service of seasonal balancing. Cooperative G tried to amend seven Marketing Orders in the Southeast to allow for hauling credits to meet excess fluid demand or dispose of excess supply (USDA, News Division, pp.4-5). This cooperative undertakes several balancing

activities. In the fall, it brings in milk from areas where it doesn't have members. The cooperative brings in milk from the Midwest, Southwest, Pennsylvania, and Maryland to meet the needs in its market. Cooperative G has to pay to obtain this milk; from July 20, 1987 to the middle of October of 1987 the net cost to the cooperative of obtaining this milk was 1.2 million dollars.

Cooperative G also undertakes balancing activities in the spring. This cooperative handles more than its pro rata share of the seasonal flush; it operates butter, powder, and cheese plants. Since 1983, these plants have been closed from July until March and operate at near full capacity from March through June. The fixed costs that are not covered when these plants are idled is a major cost of balancing that cooperative G bears.

7.2.1 b Micro - Micro Coordination

There is membership support for seasonal balancing. There have not been many members who have left the cooperative as a direct result of this service, but there is a free rider problem. According to cooperative G, the price their members receive is less than others in the market because their members bear a disproportionate share of the cost of the service (USDA, News Division, p.26). Furthermore, testimony at the Federal Order hearing by former members of the cooperative indicated that they left the cooperative to obtain a higher price (USDA, News

Division, p.27). Nonmember producers benefit from the cooperative's seasonal balancing activities but do not bear the cost. The proposed amendments to the Marketing Orders were cooperative G's attempt to eliminate the free rider problem (USDA, News Division, p.26). Free riders will continue to be a problem as long as the cooperative is placed at a competitive disadvantage because of the marketwide services it pursues. They will be a problem as long as those who do not belong to the cooperative receive a higher price than those who do.

This cooperative bears much of the cost of seasonal balancing. It was estimated that all cooperatives in the market bear 90 percent of the costs of providing all marketwide services, and cooperative G bears 60 percent of the total in this market area. As noted, this places the cooperative at a competitive disadvantage compared to other market participants.

To offset the costs of balancing this market, cooperative G attempted to obtain a hauling credit for bringing in supplemental milk supplies; it tried to obtain a credit of 3.3 cents a hundredweight per 10 miles distance between shipping and receiving plants (USDA, News Division, pp.4-5). This credit was based on actual costs borne by the cooperative. The cooperative also tried to have the Orders amended so that it was compensated for operating plants that process seasonal reserves. The payment this

cooperative tried to receive for this service varied from 62 to 94 cents per hundredweight depending on the Order (USDA, News Division, p.5). This was an attempt by the cooperative to cover the fixed costs of the plants when they are not in use.

There was widespread membership support for having the Orders amended. The members of the cooperative are aware of the fact that they bear a disproportionate share of the cost of these services, and as a result, their net price is less than nonmembers. The reason this cooperative tried to amend the Orders was to address the free rider problem. The primary opposition to these proposed amendments came from processors and fluid handlers who were afraid that cooperative G would gain market share. The fact that the cooperative was not able to get the Orders amended will affect both micro and macro coordination.

7.2.1 c Micro Coordination

If the cooperative stopped its seasonal balancing activities it feels that several things would happen. Prices would rise in the fall and there would also be seasonal price fluctuations. The price level would also fall toward the order minimum. The over - order premiums would be reduced because the cooperative would not have to be compensated for the service. Another result would be the inefficiencies that would occur from milk moving in an

unstable manner.

This cooperative believes that there would also be market disruptions because all handlers and manufacturers would have to obtain outside sources of milk during the fall and winter, and obtain an outlet for excess milk in the spring and summer. Seasonal balancing insulates processors and fluid handlers from the potential instability and uncertainty and reduces the potential for over or underinvestment in the dairy subsector. In this part of the country where there are so few firms, poor investment decisions could cause serious market disruptions. There are also economies of scale from having only one or a few organizations performing the activity of seasonal balancing.

There is a free rider problem at the micro level as well as the micro - micro level of coordination. Limited service cooperatives as well as processors and fluid handlers benefit from the balancing activities this cooperative undertakes without paying for them. This cooperative does not possess sufficient market control to be completely compensated for these services through over-order premiums. It currently charges proprietary firms for balancing but cannot completely offset the total cost of this service due to the level of competition in the market.

7.2.1 d Macro Coordination

Cooperative G attempted to have the Marketing Orders in the area it operates in amended; their effort was unsuccessful. This cooperative has tried to have the Orders amended since 1971, the primary rationale for amending the Orders was to eliminate the free rider problem. How this cooperative will change its operating procedures as a result of the decision will have effects on macro coordination.

If a cooperative is not able to obtain sufficient compensation for the service, it is less likely to provide it. A cooperative may not ship milk from outside sources and it may be less willing to give up milk for the fluid market. Alternatively, a cooperative could increase the price it charges its customers. However, if the cooperative does not possess the control over the market to enforce a price level that covers the cost of balancing it will lose customers. If this is the case, the cooperative will likely cut back on its balancing activities.

This would adversely affect coordination. This would likely lead to fluctuations in supplies and prices, and could lead to over or underinvestment in this market area. Macro coordination will be adversely affected if a cooperative does not possess the market power to force processors and fluid handlers to bear some of the costs of balancing.

7.2.2 Cooperative H

7.2.2 a Background

Cooperative H is another cooperative that provides the marketwide service of seasonal balancing. In this market, seasonality of production varies by a difference of 10 percent between the highest and lowest months of production. Due to this, and the fact that the demand for fluid milk also varies seasonally, the cooperative balances the seasonal surplus.

This cooperative makes milk available for fluid consumption in the fall and winter by idling manufacturing plant and equipment. During these months plant utilization is approximately 70 percent of capacity and therefore some fixed costs are not covered. This is the cooperative's major balancing expense which the membership partially bears. This cooperative usually does not have to transport milk to seasonally balance the market.

7.2.2 b Micro - Micro Coordination

There is membership support for providing this service. However, there is also strong support from the membership to pay their "fair" share for these services and no more. This cooperative is well aware of the fact that, due to the public good characteristics of these services, other market participants benefit from marketwide services without bearing any of the costs. As a result of the fact that the cooperative's membership is adversely affected by

this situation, some producers have left the cooperative; competition amongst handlers has led to a reduction in the cooperative's membership. The free rider problem is an issue in this market.

The cooperative estimates that the cost of providing the marketwide services of seasonal balancing and marketwide information is 19 cents a hundredweight. The over - order premium helps offset this cost but it does not address the free rider problem. All producers, whether or not they belong to the cooperative, receive the same blend price. The incentive to free ride on the cooperative's activities still exists in the presence of over - order premiums.

This cooperative is not unique in providing this service. There is another cooperative that balances supplies in this area. Also, any processor has the ability to give milk to the fluid market in the short season if it elected to do so. However, cooperatives are the only market participants actually balancing supplies.

7.2.2 c Micro Coordination

Cooperative H believes that micro coordination would also be adversely affected if this cooperative stopped providing the marketwide service of seasonal balancing. The primary result would be increased market volatility. Fluid handlers would have to operate manufacturing plants or have to pay the cost of

transportation in order to handle milk in excess of their fluid needs. Technical efficiency is likely enhanced by having one or two organizations balance supplies in this market; there are apparently economies of scale in performing seasonal balancing activities. In this market, there are two cooperatives that currently balance seasonal supplies. This is less costly than having each proprietary firm balance its own seasonal supplies. In summary, due to the fact that the cooperative balances seasonal supplies, net costs to market participants are lower than they otherwise would be, and market stability is enhanced.

There is also a free rider problem at the micro level as well as the micro - micro level. Processors and fluid handlers are insulated from fluctuations in supply and demand without having to pay for this insurance. This fact reduces the cooperative's ability to provide this service and the cooperative's membership suffers because they bear the cost of providing the service. Also, other cooperatives that do not provide seasonal balancing services benefit from the increased market stability that results from cooperative H's balancing activities without paying for the service.

7.2.2 d Macro Coordination

As noted above, coordination is enhanced through the increased technical efficiency cooperative H provides

by performing the service of seasonal balancing. If the Order is amended, there would not be an effect on the price level. The over - order premiums would not be affected. Instead, pool funds would be reallocated so that cooperative H's producers would receive more than they currently do. Total farm income would remain the same but the members of cooperative H and other market participants who perform the service of seasonal balancing would no longer bear a disproportionate share of the cost. The free rider problem would be alleviated by amending the Order.

The critical problem this cooperative faces in balancing seasonal supplies is the free rider as outlined in the micro - micro and micro sections of this chapter. In order for basic market performance goals to be met this service needs to be offered, and over time, the cooperative has performed this task. The cooperative may not be uniquely qualified to balance seasonal supplies but it is one of the few participants actually willing to provide this service. Macro coordination would be adversely affected because per hundredweight balancing costs would be higher and the market would be less stable if the cooperative stopped balancing supplies. Currently, the cooperative is at a competitive disadvantage because it bears a disproportionate share of the cost. Cooperative H could offset some of this cost if the Orders were amended.

7.2.3 Cooperative I

7.2.3 a Background

This cooperative is very active in seasonal balancing. Cooperative I is part of the Chicago Milk Producers Cooperative (CMPC), a cooperative federation that operates in the Chicago market. Cooperative I balances seasonal supplies in two ways. In the fall and winter, it takes milk out of its manufacturing plants to meet fluid demand. In the spring, when the milk supply is greatest, this cooperative opens up its excess capacity to handle this milk. Furthermore, it transports milk to near and distant markets.

Also, through the CMPC, the market is split so that all cooperatives share in the burden of balancing supplies. While much of the burden of balancing falls on cooperative I, other cooperatives also participate in balancing activities. The major cost of balancing is the foregone profit of the manufacturing plants in the fall. Average costs rise when the plants are not operated at full capacity. However, cost estimates are difficult or impossible to obtain.

7.2.3 b Micro - Micro Coordination

Cooperative membership, although more informed than nonmember producers, may not be totally aware of the function of seasonal balancing. The primary effect of balancing on coordination is primarily at the macro level,

and secondarily at the micro level. However, stability both to members and nonmembers, is improved because price fluctuations are reduced as a result of the balancing activities of operating manufacturing plants and transporting milk.

However, the service is somewhat of an issue with the membership. Some of the membership is aware of the fact that the cooperative is bearing a disproportionate share of the cost of balancing. It was estimated that this cooperative bears approximately 80 percent of the cost of balancing and that the share of the cost borne by this large cooperative rises in the cooperative's southern region which is not part of the CMPC. This is reflected in the fact that the price received by the membership is a few cents less than nonmember producers. Some members have left due to the fact that the price for members is somewhat lower and others may not have joined the cooperative for the same reason. However, actual numbers are not possible to obtain. Producers may not realize that they are free riders, they do not intentionally take advantage of the cooperative, but apparently react to the net price they receive.

7.2.3 c Micro Coordination

Cooperative I believes that seasonal balancing has several effects on micro coordination in this market. It adds stability and enhances technical efficiency. It

enhances stability by reducing seasonal price fluctuations. It reduces "boom - bust" cycles that would result in the absence of seasonal balancing. It ensures a healthy dairy industry in the flush spring period which allows it to meet fluid demands in the short fall season. This activity allows processors and handlers to know in advance the price they will pay for Class I and Class II milk.

Technical efficiency is enhanced as a result of one organization, the CMPC, balancing supplies. If cooperatives did not balance supplies, the burden would fall on individual fluid handlers and processors. Since there appears to be economies of scale in manufacturing plants (Ling 1983, pp.10, 18, 21), the total cost of balancing seasonal supplies would probably increase if cooperatives, such as cooperative I, did not undertake this activity.

There is also a free rider problem at the micro level in this market. As noted, seasonal balancing is a high exclusion cost good. This fact makes seasonal balancing more difficult. Processors, fluid handlers, and small cooperatives benefit at the expense of large cooperatives, such as cooperative I, which bear the brunt of the cost of seasonal balancing. Performance would likely be improved if these costs could be shared. The CMPC is an attempt to share these costs.

7.2.3 d Macro Coordination

It is difficult to imagine how the market cooperative I operates in would continue to function in an orderly fashion without the seasonal balancing activities cooperative I in particular, and the CMPC in general, undertake. Cooperatives are uniquely qualified to undertake seasonal balancing activities. Not only is stability and technical efficiency enhanced but price wars, as well as shortages and surpluses are reduced. Without cooperative involvement, uncertainty would increase, decisionmaking would be more difficult, and there would be disruptions of the fluid market. Price fluctuations would be a result.

Furthermore, cooperative I argues that without the CMPC, cooperatives would also engage in price wars and would be unwilling to supply fluid needs in the fall. The CMPC allows cooperatives to act together instead of competing in a way that would destabilize the market. An interesting aspect of the CMPC's activities is the committed supply credit, a type of contractual agreement in which fluid handlers and cooperatives agree to commit themselves to handle or meet supplies on a 365 day basis. This adds stability, reduces uncertainty, and helps match supply with demand. This insures that supplies will be available in the fall.

One problem currently faced in this market is

cooperatives's willingness to take cheap milk in the spring and summer and their reluctance to give up milk in the fall and winter. Committed supplies, and the power of the CMPC, reduces this problem and improves macro coordination or at least prevents macro coordination from being adversely affected. Without the CMPC, those cooperatives that balance supplies would bear an even greater share of the cost.

It is obvious that coordination of this market at both the micro and macro levels would be difficult without the CMPC. This cooperative federation shares the costs of various services and presents a unified voice in negotiations with proprietary firms. It prevents predatory pricing in this highly competitive market and gives cooperatives such as cooperative I sufficient control over the market to undertake these activities without loss of profitability or market share. Without the CMPC and the control it gives member cooperatives, marketwide services such as seasonal balancing may not exist. No single cooperative has enough control over the market to undertake various marketwide services.

There is a free rider problem in this market. There are some processors, fluid handlers, producers, and limited service cooperatives that benefit from the seasonal balancing services cooperative I and the CMPC provide but do not pay for the service. This is due to the fact that

seasonal balancing is a high exclusion cost service. The CMPC helps maintain the market power needed to insure that those cooperatives that balance supplies do obtain some payment through the over - order premiums for providing this service. Cooperative I, which actively balances seasonal supplies, benefits from the over - order premiums.

Cooperative I and the CMPC are in favor of being compensated for these services through over - order premiums. This allows flexibility in charging for these services. The cooperative feels that obtaining accurate cost estimates for most of these services is difficult and the over - order premium provides an umbrella payment for all marketwide services. However, it should be noted that cooperatives may not have an incentive for obtaining cost estimates for these services. If the total cost of providing the service was less than the over - order premium, it would be argued that cooperatives are earning excess profits. It may be the case that the over - order premium does represent charges for marketwide services and profit.

Cooperative I is in favor of amending the Federal Order to obtain credit for transportation. Of all marketwide services transportation is amongst the easiest to understand and the cost estimates of transportation are amongst the easiest to obtain. Cooperative I, in conjunction with the CMPC, amended the Order. Neither

cooperative I nor the CMPC are attempting to receive direct compensation through the Federal Order for seasonal balancing.

7.2.4 Cooperative J

There is membership support for this service. In the past, the cooperative has received 1 cent a hundredweight for operating balancing facilities. This cooperative is also currently able to charge handlers for seasonal balancing, and the reduced output due to the DTP has made seasonal surpluses less of an issue. Also, this cooperative has not transported milk in the past to balance supplies. For these reasons seasonal balancing is not currently much of a coordination issue.

However, balancing could conceivably be an issue in the future. This cooperative does possess the means to balance supplies. Also, this cooperative is attempting to institute a base - excess plan in the Order to reduce seasonal supply fluctuations. Should there once again be an increase in production, the cooperative will find itself in a position to perform the service of seasonal balancing. If this occurs, problems such as the free rider and the cooperative membership's share of the cost will become coordination issues.

7.3 Marketwide Information

7.3.1 Cooperative G

7.3.1 a Background

Cooperative G supplies several types of marketwide information. It provides market analysis, and current market information. It also provides policy evaluations, particularly in respect to national programs; this includes lobbying. Furthermore, it provides information on amendments to Federal Milk Marketing Orders.

Cooperative G also provides marketwide information on technical developments, an example of this being information concerning bovine growth hormone. It provides information to all producers on quality and production, such as methods to reduce somatic cell counts and proper milk parlor maintenance. This cooperative also provides field services and demonstrations for all producers.

Cooperative G also attempted to amend the same Orders to allow for payment for marketwide information as it did for seasonal balancing. Under its proposal, a cooperative would have received 3 cents a hundredweight from the producer settlement fund for providing this service. However, cooperative G defined a qualified cooperative in such a way that it would usually be the only cooperative eligible for the payment (USDA, News Division, pp.6-8).

7.3.1 b Micro - Micro Coordination

There is widespread support amongst the membership for the marketwide information services cooperative G provides. There is also somewhat of a free rider problem with marketwide information as well as seasonal balancing. In fact, one of the information services this cooperative provided was to inform producers about the concept of the free rider and the problems that they cause. Due to the free rider problem there was strong support from the cooperative's membership to have the Orders amended. Cooperative G also works with other cooperatives in providing information to their membership. This cooperative also bears much of the cost of supplying marketwide information.

It was estimated cooperative G bore 60 percent of the cost of providing marketwide information. In order to offset this cost, the cooperative attempted to amend several Federal Milk Marketing Orders in its operating area. This cooperative tried to obtain a 3 cents a hundredweight assessment for providing marketwide information (USDA, News Division, pp.6-7). This was based on actual cost estimates. It was intended to cover the costs of salaries, travel expenses, and publications. Determining the costs of marketwide information was somewhat more difficult than estimating the costs of seasonal balancing. Nonetheless, it is the member

producers who bear the cost of the service through lower net prices.

Producers derive many benefits from the information services this cooperative provides. Knowledge of policy and marketing information helps producers plan for the future. This adds stability and reduces the possibility of producers over or underinvesting in fixed assets. Also, through various information services, the cooperative helps producers make decisions concerning feed costs and whether or not they should grow their own feed. This also affects producer planning for the future.

7.3.1 c Micro Coordination

This cooperative asserts that the marketwide information it provides also benefits manufacturers and fluid handlers. This market area's milk supply was unusually short this fall; on July 1, 1987 cooperative G met with manufacturers and fluid handlers in order to determine how to meet their needs. Efforts like this allow processors and fluid handlers to plan ahead and make price decisions. The information services cooperative G provides allows fluid handlers to improve their decisionmaking abilities concerning long term commitments and to decide whether or not to obtain new producers. It helps them determine and analyze current and future market fundamentals. Through the cooperative's market analysis processors are able to adjust their labor requirements,

output mix, and to make other management decisions. These services reduce uncertainty at the micro level of coordination. If the cooperative stopped providing marketwide information, the planning just outlined would be more difficult and the level of uncertainty would increase.

There is also a free rider problem at the micro level. Limited service cooperatives as well as processors and fluid handlers benefit from the marketwide services cooperative G provides but does not pay for them. Furthermore, manufacturers and fluid handlers were opposed to having the Orders amended. They were afraid that this cooperative would gain market power.

7.3.1 d Macro Coordination

There are other organizations besides cooperatives which could provide marketwide information. University extension services, and government agencies such as the ACS, or the Agricultural Marketing Service (AMS), could also provide some of these information services. These two entities also serve as a source of data for the cooperative. However, given current budget limitations, the future role of public organizations in providing information is in question. Government budget reductions may make the cooperative's marketwide information services even more important, less information available to all market participants will increase

uncertainty.

Some of the marketwide information services cooperative G provides directly help match total supply with total demand. One example of this is through the information the cooperative provided dairymen which showed them that increasing production in the Southeast would not lead to lower prices. In fact, net producer income would be increased because dairymen would not have to bear any of the cost of transporting milk from outside areas. In this high Class I utilization market, increased production would not lead to lower prices.

There are other types of marketwide information that enhance macro coordination. This cooperative provides projections and estimates as well as price information to all market participants. This cooperative also provides analysis of legislative issues and acts as a lobbyist. Furthermore, it works with other organizations in providing national dairy advertising. These marketwide information activities are all the more important given the asset fixity problem in the dairy subsector. These activities help ensure that there is a market for the products these assets produce.

Cooperative G attempted to have several Marketing Orders amended so that it could be compensated for providing marketwide information but it was unsuccessful. This cooperative is currently studying its options in light

of this fact. It is too early to state exactly how it will change its operating procedures with respect to the activity of providing marketwide information. Given the fact that this cooperative lacks the means to be fully compensated for providing marketwide information it is likely that it will reduce the level of marketwide services it provides. Furthermore, had the Orders been amended, performance measures would have been explicitly stated and for any cooperative to be compensated it would have been forced to meet these criteria.

7.3.2 Cooperative H

7.3.2 a Background

Cooperative H also provides a number of marketwide information services. Its monthly member publication is also distributed to proprietary firms and the land grant university in the state where its members produce milk. Furthermore, it provides and sponsors leadership conferences, member meetings, and marketing seminars which tend to be more member oriented. The cooperative's management is a source of expert knowledge to the media and elected officials. This type of information reaches any market participant who has access to the media.

Cooperative H is also active in providing policy information. Cooperative H is active in the Federal Milk Marketing Orders. It provides testimony in support or opposition to amendments to the Order in addition to

formulating its own amendments to the Order. Cooperative H is also part of the National Milk Producers Federation (NMPF), which is an organization comprised of cooperatives; this organization analyzes dairy subsector issues and interacts with policymakers at the national level. Nonmember producers, as well as the cooperative's membership, benefit from the information services this cooperative provides.

7.3.2 b Micro - Micro Coordination

There are several types of information services this cooperative provides that improves a producer's decisionmaking abilities and therefore enhances coordination. Situation and outlook information keep producers abreast of market conditions. This type of information helps producers plan for the future. This adds stability and reduces the possibility of over or underinvestment in dairy production. Also, producers are given information on dairy policy issues at the national level through the NMPF. This also helps producers plan for the future and gives them a voice in making policy.

Cooperative H also provides information on farm management issues. An example is the potential utilization of bovine growth hormone. The cooperative also works with the extension services and the Dairy Herd Improvement Association in providing information services to producers.

An interesting aspect of some information

services is that it provides feedback between the cooperative's management and its member producers. This helps the cooperative's management meet membership needs, and gives producers a voice in policy issues and other areas of interest to the membership. The decisionmaking capabilities of the cooperative's management is improved. The major form of feedback is the annual local producer meetings which provide a forum for the membership to air their concerns. Communication is two way, and through this feedback, the ties between management and membership are strengthened.

As noted in the discussion of seasonal balancing, there is a free rider problem. The over - order premium helps offset this cost but it does not address the free rider problem. Other cooperatives which provide marketwide information in this area face the same problem.

7.3.2 c Micro Coordination

Cooperative H provides processors and fluid handlers with information that improves their decisionmaking abilities. The cooperative provides processors and fluid handlers with projections of future supplies and prices. This improves their ability to plan for the future and to adjust their labor requirements. It also allows processors and fluid handlers to make adjustments in their manufacturing capacity or make improvements in existing plants with more confidence about

the future. This reduces the probability of proprietary firms over or underinvesting in plant and equipment and also enhances stability. Cooperative H has also given proprietary firms information concerning some of the issues that the dairy subsector faces if the CCC purchases more than 5 billion pounds of milk in 1987. This also helps processors and fluid handlers plan for the future.

Cooperative H also offers other types of information to processors and fluid handlers. It provides fluid handlers with information concerning fluid supplies, this helps fluid handlers meet their commitments. This is less of a problem in this market because the cooperative has made the effort and will continue to make the effort to meet the demands of fluid handlers. This cooperative does not offer much information concerning demand fundamentals, processors and fluid handlers do this themselves.

If this cooperative stopped providing marketwide information several things would occur. To a great extent, information is part of the overall package cooperatives offer proprietary firms as a part of supplying their needs. The free rider problem is more of an issue with nonmember producers than with proprietary firms. However, if the cooperative stopped providing marketwide information, it feels that other sources besides the cooperative would become more important. Examples of these alternative sources of information would be the extension service,

private industry, or government agencies.

7.3.2 d Macro Coordination

The cooperative provides several types of information that aid in matching aggregate supply and demand in this market. Cooperative H provides information concerning Marketing Orders, and through the NMPF provides policy information. This improves the decisionmaking abilities of those who formulate and carry out policy. The cooperative also provides information concerning the level of CCC purchases to market participants. The cooperative has also stressed the importance of discretion in analyzing potential production increases and helps farmers analyze their cash flow. These information services reduces the potential for overinvestment in dairy production and the surpluses that this overinvestment would cause. This directly enhances macro coordination.

Cooperative H provides a wide range of information on a number of other issues. In the past, it has provided information on the DTP that helped producers determine their bid. It is currently working on ways to increase the diversification and market development of dairy products. Also, the cooperative is analyzing the future competitiveness of the dairy industry in this area as compared to other parts of the country. This also improves the decisionmaking abilities of a wide range of market participants.

The cooperative is not currently attempting to amend the Federal Order to be compensated for providing marketwide information, nor does it appear that it will attempt to do so in the near future.

7.3.3 Cooperative I

7.3.3 a Background

Cooperative I undertakes several marketwide information activities. The cooperative publishes a membership magazine which has a limited readership. For the most part, only the cooperative's membership reads it, but there are some marketwide information aspects of the publication. Also, there are meetings with the board of directors. These meetings inform the board, and the members of the board disseminate this information via word of mouth throughout the market area. Again, the membership is most likely to be the greatest direct beneficiary of this type of information. Cooperative I also conducts several meetings of various size throughout the states where the cooperative has members. There are also some marketwide aspects of this type of information.

The management and leadership of cooperative I are also a source of information. Radio and print media use this resource for expert information and their knowledge is disseminated throughout the market area. Another major activity this cooperative undertakes is its political actions. These activities provide information to

policymakers at the federal and state levels. Cooperative I also provides information and interacts with various bureaucracies, in particular the AMS, that has effects on coordination.

There are some information activities that primarily affect processors and fluid handlers. Cooperative I and the CMPC exchange information with processors and fluid handlers that deals with various market conditions that these market participants face. Also, cooperative I provides information on a weekly basis that gives the total butterfat and protein levels in the milk supply.

7.3.3 b Micro - Micro Coordination

Cooperative I is actively involved in providing marketwide information, much of which benefits its membership. The cooperative disseminates information through its member publication. Some of this is repackaged in a form that is easier for producers to use from raw data and information from such sources as university extension, the National Dairy Board, or the NMPF. USDA data is also used. The cooperative also provides expert knowledge for the local press which benefits all producers and other market participants.

The cooperative also provides information on policy issues as well as farm management information. This improves the decisionmaking abilities of producers in

analyzing both policy and production problems. An informed producer is better able to deal with changing conditions in the marketplace. Cooperative I is able to inform producers whether or not a processor is financially able to meet his commitments, whether or not he can pay the producer. This information helps aid the decisionmaking abilities of producers.

There are other forms of marketwide information that affect micro - micro coordination. Cooperative management interacts with its membership through board meetings, delegate sessions and smaller meetings throughout the area where the cooperative has members. Some of the information disseminated through these meetings is spread throughout the market area via word of mouth.

This cooperative feels that providing information to members is a very important activity. Information the cooperative provides and the feedback it gets from its membership adds cohesion to the cooperative. It gives the members of the cooperative a sense of common purpose and unity as well as a sense of belonging amongst those involved with the cooperative. This interaction also allows the membership to be involved in policy issues. The cooperative is the voice of the membership at the state and federal levels. Furthermore, this information gives the cooperative a higher profile among nonmembers and can be seen as good public relations for cooperative I.

Membership information services are crucial for the cooperative to keep the membership informed and involved in the cooperative's activities. The cooperative could not exist as such without membership information services.

These information activities make the membership more aware of what services, marketwide and other, the cooperative performs. This has made the membership aware of the fact that they are bearing a disproportionate share of the cost of providing the service. A very rough estimate is that 60 percent of the cost of providing marketwide information is borne by the cooperative. Net pay prices are lower than nonmember pay prices and this acts as an incentive for producers to leave the cooperative or not join the cooperative. However, it cannot be determined how many producers have quit or have not decided to join cooperative I because of this fact. There is a free rider problem but it is difficult to quantify or analyze in any depth.

7.3.3 c Micro Coordination

Cooperative I provides processors information concerning the quality of milk. Cooperatives test their membership's milk, and processors and fluid handlers are given information concerning the composition of the milk supply. The cooperative gives processors and fluid handlers information concerning butterfat and protein content.

In addition to information about the composition and quality of milk, the cooperative also provides proprietary firms with information concerning market conditions. Cooperative I provides manufacturers and fluid processors with information concerning prices, terms of trade, and other market conditions. This enhances stability in the market and improves competition. Marketwide information increases processors and handlers knowledge of market conditions and this leads to a reduction in price disruptions (Stigler, p.214). Processors and handlers as well as consumers may be unwilling or unable to make the requisite investment in information, therefore the marketwide information services provided by the cooperative reduce price dispersion and reduce instability (Stigler, p.220). These information activities also enhance the technical efficiency of processors and fluid handlers. Daily interaction between the cooperative, processors, and fluid handlers allow proprietary firms to alter their bottling and manufacturing schedules and reduce per unit costs.

More information helps ensure that all market participants are treated equitably. The cooperative feels that if it did not provide these marketwide information services this information would likely become proprietary. Market participants in the dairy subsector are of different size and possess different degrees of market power, the

marketwide information cooperatives provide help maintain a "level playing field" (Bonnen, p.16), a market in which all participants are treated equitably, and enhances competition in the dairy subsector. Without the marketwide information services provided by the cooperative, the market power and profits of proprietary firms would likely increase.

7.3.3 d Macro Coordination

Macro coordination is improved in this market through the information that is exchanged between the cooperative and processors and fluid handlers. Through this flow of information the decisionmaking abilities of the market participants is improved. There is less market disruption and instability as a result of these services and there is less overpayment or underpayment for dairy products as a result of this service.

Cooperative I also provides information to policymakers at various levels. It discusses policy issues with elected officials. This helps their decisionmaking process. Cooperative I also works with various government agencies such as the AMS to analyze and discuss market conditions. These activities also help match aggregate supply with demand and gives dairy producers a voice in dairy policy issues.

This cooperative is not attempting to amend the Order to be compensated for marketwide information.

However, it is not possible for the cooperative to be compensated voluntarily for these services due to the free rider problem. If some market participants did compensate the cooperative and others did not, those that did would be placed at a competitive disadvantage. The cooperative does receive indirect payment for marketwide information through the over - order premium set by the CMPC. Over - order premiums give cooperatives, as well as other market participants, greater flexibility than would the Orders if they were amended to include payment for marketwide information.

7.3.4 Cooperative J

7.3.4 a Background

This New York cooperative already receives an assessment for both seasonal balancing and marketwide information. These payments are part of the New York - New Jersey Marketing Order. This Order is unique in that it allows cooperatives to be paid for providing marketwide information.

In order for cooperative J to be compensated it must meet certain conditions. It must analyze milk marketing problems and possible solutions, and prepare relevant statistical data. It must also analyze and prepare amendments to the Federal Milk Marketing Order and participate in Order amendment proceedings. The cooperative must also participate in meetings called by the

Market Administrator and present data at such meetings.

Also, a qualifying cooperative must conduct a comprehensive education program for all producers, not just the cooperative's members. This includes issuing publications and conducting educational meetings (Market Administrator, p.23). These conditions must be met for a cooperative to be compensated for marketwide information.

7.3.4 b Micro - Micro Coordination

The basic conditions that this cooperative must meet to obtain a payment from pool funds have been outlined. In order to meet these requirements, the cooperative provides several types of information services. This cooperative makes its member publication available to all producers in the market at a subscription rate of one dollar per year. This publication provides information to producers concerning marketing, policy, and a range of farm management issues. Cooperative J also provides press releases through the director of public relations and provides the local media with expert personnel. These types of information are available to all market participants and provides information on market conditions and various policy issues.

Another very important marketwide information activity this cooperative provides are educational meetings with producers. In order to qualify for payment these meetings must be open to all producers, members and

nonmembers alike. This cooperative, and another cooperative that operates in this market, undertake these meetings in a joint venture in order to reduce costs and eliminate repetition. The emphasis of these meetings is on price and marketing issues; producers receive a great deal of situation and outlook information at these meetings. These meetings cannot be held more than 50 miles away from any one producer.

These services do improve the decisionmaking abilities of producers. Some of the dairy farm management information has improved milk quality through lower somatic cell counts. However, the meetings focus on marketing and policy. This information helps producers plan for the future, dairymen make future production decisions using the information on prices and supplies based on the information the cooperative provides. It also provides forecasts based on possible changes in the support price which also aids dairymen's decisionmaking abilities concerning the future.

The cooperative receives 3 cents a hundredweight for providing the marketwide service of marketwide information, but these information services cost the cooperative 12 cents a hundredweight. The Order payments to the cooperatives that provide these services have not increased since 1954. Currently, it does not appear to be politically feasible to have the payments increased. This

leads to some serious problems. While the existing membership supports providing the service, they are placed at a competitive disadvantage because they make up the difference between the cost of providing the service and the payment the cooperative receives.

This market is unique in that only about 50 percent of the producers are members of a cooperative. Furthermore, cooperative J has lost members and others have refused to join the cooperative because the cooperative bears the cost of providing the services. It is felt that if the cooperative received more for providing the services more producers would join the cooperative. Nonmember producers who free ride on this cooperative's information services are a critical issue in this market.

7.3.4 c Micro Coordination

This cooperative actively interacts with processors and fluid handlers. Information flows between the cooperative and proprietary firms allow them to interact with each other and give both the cooperative and the proprietary firms the opportunity to discuss each other's needs and problems. The information flows help meet the supply and demand needs of each of the participants and enhances micro and macro coordination.

An example of this is the cooperative's working with proprietary firms in analyzing the Marketing Order. In the fall of 1987, the Market Administrator had to

institute a call provision in order to insure that the demand for fluid milk was met. The cooperative helped processors and fluid handlers understand how the call provision worked and its effects.

If the cooperative stopped providing marketwide information services several things would happen. Over time, the Marketing Order would fall into disrepair, changes in the Order would not be as responsive to changes in marketing conditions as they currently are. According to the cooperative, the Orders would become obsolete and chaos in the entire market would result. Analysis of the potential of consolidating the Orders in this area or the possible increase in Class I prices would not have occurred without the cooperative's involvement, either directly or through the NMPF.

The free rider is an issue. It would not be possible for individual producers to supply this type of information. They lack the background and the resources to provide information on Marketing Orders and other types of marketing information. Apparently there are economies of scale in providing marketwide information as well as seasonal balancing. Furthermore, independent producers who benefit from the cooperative's services without paying for them is the biggest problem the cooperative faces. The free rider is less of an issue with processors and handlers. A great deal of the information flows are part

of the cooperative's natural milk marketing operation.

7.3.4 d Macro Coordination

As noted, this cooperative operates in an unique market area. This cooperative is compensated for providing the marketwide service of marketwide information. However, this cooperative's costs are not fully covered. Cooperative J has yet to decide whether or not it will attempt to amend the Order so that its payments from the pool will increase. If more of the cooperative's costs were covered, performance would likely be improved.

If the cooperative received more from pool funds it would be able to provide more and improved information services if it so desired. The services could be more sophisticated and the presentation of information could be improved. Currently, the cooperative's information services are at the minimum level to meet the conditions for payment under the order, it might possibly do more if a greater proportion of its costs were covered.

If the cooperative were paid more for providing the service, prices would likely increase. The position of the cooperative's membership would improve because they would bear less of the cost of the service. This, in turn, would make membership in the cooperative more attractive. Processors and fluid handlers would then have to raise the prices they pay their producers in order to keep them from joining the cooperative, proprietary firm profits would

fall as a result. This would likely occur because so few producers are members of a cooperative in this market. In this manner, prices paid to producers would increase if the cooperative were paid more for providing marketwide information.

The cooperative's marketwide information services primarily enhance macro coordination through its services to producers. The cooperative feels that the primary supply and demand balancing mechanism is the support price. However, through the producer meetings, the cooperative provides outlook and situation information that allows producers to plan for the future and adjust their production patterns. It is through this type of marketwide information that total supply in the market is affected to match demand more closely.

Another form of marketwide information that affects macro coordination is through the cooperative's activities with the NMPF. This allows dairy cooperatives to provide information to policymakers that improves their decisionmaking capabilities concerning Marketing Orders and other dairy policy issues. This cooperative is also active in providing information and amendments to the Marketing Orders which improve the performance of this institution.

7.4 Findings

Both seasonal balancing and marketwide information enhance the vertical coordination of the

subsector; hypothesis III holds. Seasonal balancing enhances coordination by reducing market instability and directly matching supply and demand in different markets. This is particularly true in the Chicago market. All market participants benefit from the cooperatives's seasonal balancing activities. Seasonal balancing exhibits economies of scale. The cost of seasonally balancing a market is lower if one or a few organizations carry out this activity. Technical efficiency is enhanced by having a few market participants carry out this activity. Cooperatives appear to be the only market participant willing and able to undertake this activity.

Marketwide information also enhances vertical coordination at all levels. Cooperatives offer a wide range of marketwide information services. The information services enhance the decisionmaking abilities of producers, proprietary firms, government officials, and other subsector participants. This reduces the possibility of over or underinvestment in the subsector. Stability is also improved as a result of the marketwide information services supplied by cooperatives. Much of this information improves communication flows between the cooperative and other subsector participants. This is particularly true for information flows and interaction between the cooperative's management and membership.

Micro - micro coordination in particular, is enhanced as a

result of some of the marketwide information services. This adds cohesion to the cooperative and gives it a sense of unity.

As a general rule, cooperatives are placed at a competitive disadvantage with respect to other subsector participants as a result of performing marketwide services. They bear a disproportionate share of the cost of providing these services which benefit other subsector participants as well. Free riders, especially nonmember producers, place the cooperative at a disadvantage and likely reduce the cooperative's ability or desire to pursue these activities.

If cooperatives do not receive sufficient remuneration for providing these services several things are likely to happen. The cooperative is less likely to provide these services at the level they would if they did receive compensation. This will adversely affect coordination: in particular, markets will become less stable. Also, cooperatives are more likely to turn to the Orders or form cooperative federations to address this issue. Federations could give cooperatives enough market control to receive adequate compensation for providing marketwide services.

Cooperatives have two means at their disposal to receive compensation for providing marketwide services. They could amend the Orders, which is becoming more common;

or they can charge over - order premiums, obtaining prices above the minimum Class I price set by the Orders, which is quite common in some areas. The major problem with over-order premiums is that they do not eliminate the free rider, there is still an incentive for producers to leave the cooperative and nonmembers to stay out of the cooperative that performs marketwide services. Also, over - order premiums do not explicitly state the costs of marketwide services.

Most of these problems would be eliminated if compensation for marketwide services were made part of the Federal Order. Cost and performance criteria would be explicitly stated. Furthermore, all market participants would share the costs of these services; the free rider problem would be eliminated. The major problem with amending the Orders is loss of flexibility. Cooperatives would be constrained by the regulations when faced with changing market conditions. Despite this fact, cooperatives are increasingly looking to the Marketing Orders as a way to perform marketwide services without being placed at a disadvantage.

7.5 Summary

Four case study cooperatives were selected to test hypothesis III. Relevant personnel were interviewed in order to collect the information needed to test the hypothesis. It was determined that the marketwide services

of seasonal balancing and marketwide information enhance coordination in a number of ways.

Cooperatives are essential in balancing seasonal supply and demand fluctuations. This entails transportation of milk and/or operating manufacturing plants to handle the seasonal surplus. Seasonal balancing adds stability, and helps match supply with demand. This service also exhibits economies of scale. Technical efficiency is improved if only a few participants provide this service. Cooperatives appear to be the only subsector participant willing and able to undertake this activity. Coordination at the micro - micro, micro and macro levels is improved as a result of these cooperatives's seasonal balancing activities.

Coordination is also improved as a result of the cooperatives's marketwide information activities. Marketwide information improves the decisionmaking abilities of all subsector participants and therefore enhances coordination at the micro - micro, micro, and macro levels. The potential for over or underinvestment is reduced, and stability is improved as a result of the information services provided by cooperatives.

The provision of these services often place the cooperative at a competitive disadvantage. Free riders are a particular problem. If this continues, the ability and desire of cooperatives to perform these services will

decline. In order to receive some compensation for providing marketwide services, cooperatives have charged over - order premiums. Also, cooperatives are turning to the Federal Orders to receive compensation for providing these services.

CHAPTER 8: FURTHER ASPECTS OF COOPERATIVES AND VERTICAL COORDINATION

8.1 Introduction

The last three chapters have analyzed three activities cooperatives undertake. The effects of these activities on vertical coordination at the micro - micro, micro, and macro levels have been discussed. This chapter is an attempt to synthesize the previous chapters and to state and analyze four conditions or issues that impact the cooperative's ability to affect vertical coordination. It is an attempt to draw generalizations from the experiences of the case study cooperatives.

There appear to be two conditions needed for a cooperative to be able to enhance coordination at various levels. The first is member support and the second is a degree of control over the market. Furthermore, if cooperatives lack sufficient control they can turn to various types of regulations and policies. Some conditions and issues are more important at some levels of coordination than others. This makes generalizations difficult. There are also certain aspects of cooperatives that are unique. This uniqueness also affects coordination, particularly at the micro - micro level.

8.2 Micro - Micro Coordination

8.2.1 Member Support

In order for a cooperative to be successful in carrying out coordinating activities it must have the support of its membership. This is a critical aspect of micro - micro coordination. Cooperatives are an unique form of organization in that they are controlled by the membership. Dairy cooperatives are successful only when the membership contributes actively to the cooperative; those associated with the cooperative share one or more common goals such as profit maximization; and when communication among those associated with the cooperative is present (Helmberger and Hoos, p.277). In order for a cooperative to be successful micro - micro coordination must be sound.

It was stated by several of those interviewed that the primary goal of the cooperative was to maximize the profits of its member producers. If the cooperative is successful in maintaining prices that are higher than, or equal to, the rest of the market, it will not have a problem in keeping its membership or maintaining its market position. Micro - micro coordination will remain sound. However, if a cooperative is placed at a competitive disadvantage because of the coordinating activities it pursues it will face problems. Producers will leave the cooperative, which will lead to a reduction in the control

a cooperative has in the market and a loss of support. Examples in this research of this fact are the marketwide services case studies of cooperatives G and J, as well as the supply management case studies of cooperative E, and to a lesser extent, cooperative F. Cooperatives need the support of their membership to undertake coordinating activities.

8.2.2 Education

The management of the cooperatives are aware of this fact. This is why cooperatives offer education programs and conduct member meetings. The case study cooperatives undertake a wide range of education activities that inform the membership about the various functions the cooperative performs. These educational activities also address some of the problems and issues that the cooperative faces.

Information flows from the management to the membership and vice versa. Cooperatives allow producers to state their concerns and to assist in formulating and implementing cooperative policies. This happens at member meetings, when the cooperative conducts member surveys, and whenever a vote on a cooperative's policy is held. These are common practices among dairy cooperatives. These forms of communication allow the membership to influence or determine the policies of the cooperative. Information flows help management and membership identify and meet

cooperative goals and enhance micro - micro coordination.

8.2.3 Micro - Micro and Other Levels of Coordination

Dairy cooperatives will adjust their practices in order to gain member approval. In this study, cooperatives were particularly responsive to the questions raised by the membership in regards to multiple component pricing and supply management. Sometimes, in order to be responsive to members, the cooperative may alter its practices in a way that reduces the cooperative's ability to enhance coordination at the micro and macro levels.

The case studies provide examples of this. Cooperatives A and B, due to the level of competition in the market area, and membership concerns, have used their MCP systems as a gimmick and not as a method to enhance coordination. Cooperative C has developed its system in a way that reduces member controversy. Cooperative F eliminated its supply management program when supplies tightened and it appeared that it would lose membership if it continued its base - excess plan. Cooperative E's Class I plan became less popular with its membership with the passage of time and its program was also eliminated. Cooperatives that provide marketwide services may alter their practices because their members are bearing a disproportionate share of the cost of providing these services.

8.3 Micro Coordination

8.3.1 The Uniqueness of Cooperatives

The previous discussion pointed out the importance of membership support in undertaking coordinating activities; this fact affects micro coordination. Cooperatives give producers the opportunity to express themselves and allow them to negotiate with proprietary firms in a unified manner. This gives producers a degree of power or strength that varies from market to market. Cooperatives allow producers to pool their resources in a way that concentrates milk supplies.

Cooperatives also appear to act as a "missing hero" in undertaking some coordinating activities. They perform functions that enhance coordination at all levels that no other participant is willing or able to undertake. An excellent example of this is the marketwide services cooperatives provide. Proprietary firms benefit from some of these activities. This can cause problems if the cooperative is placed at a competitive disadvantage as a result of performing these coordinating functions. Membership concerns will arise. Again, a classic example of these conditions is marketwide services. Cooperatives are also uniquely qualified to perform some coordinating activities for other reasons.

8.3.2 Economies of Scale

The size and scope of the dairy cooperative's role in the subsector was outlined in the first chapter. This size allows the cooperative to undertake some coordinating activities at the lowest possible cost. Cooperatives can undertake some coordinating activities that improve the coordination of the subsector at a lower cost per hundredweight than other subsector participants, especially processors and fluid handlers. They exhibit economies of scale that other participants cannot match. An example of this is the marketwide service of seasonal balancing.

Technical efficiency is enhanced when cooperatives take advantage of these economies of scale. This improves coordination at the micro and macro levels. Coordination is also improved when cooperatives use this unique characteristic to enhance the stability of a market. Cooperatives are also uniquely qualified to help manage the flow of product because most of the milk in a given market is controlled by them. Examples are seasonal balancing and supply management.

8.3.3 Control and Competition

Cooperatives can be constrained in enhancing coordination at the micro level by competitive pressures. If, for example, they cannot pass on some of the cost of providing marketwide services through over - order premiums

performance is likely to decline. There are free rider problems that cooperatives face when they undertake some coordinating activities. The effects of nonmember producers can also adversely affect a cooperative's program. An example of this was the effect of nonmember dairymen's response to cooperative E's supply management program.

A cooperative needs some level of control to pursue micro coordination activities. One way to obtain control is through cooperative federations. A cooperative federation is an organization comprised of cooperatives in an attempt to pool resources, work towards common goals and achieve a degree of market control that an individual cooperative cannot obtain. Cooperative federations are a type of horizontal integration. However, there are few examples of successful federations.

One of the best known federations in the dairy subsector is the CMPC, which has already been discussed in some detail. The CMPC operates in an area of the country where there are many cooperatives and the vast majority of producers belong to cooperatives. The market area the CMPC operates in also produces more milk than any other part of the country. If the cooperatives did not work together through the CMPC, predatory pricing would likely result. This would adversely affect micro coordination by destabilizing the market. An individual cooperative in

this market does not have the ability to enhance coordination at the micro or macro level on its own, it would be too small. Other actors would take advantage of an individual cooperative. The CMPC addresses these potential problems.

Another cooperative federation is the Regional Cooperative Marketing Agency (RCMA) which is based in the Northeast. This federation is relatively strong in the New England states and is trying to extend its influence into the New York - New Jersey area. The RCMA does not have the control over the market the CMPC has. In New York, only about 50 percent of the producers belong to cooperatives. The RCMA is currently not as effective as the CMPC, but there appears to be growing interest in the federation. A major goal of both the RCMA and the CMPC is to increase the profitability of dairymen. Again, the importance of improving the welfare of member producers is the overriding reason for a cooperative activity or institution.

8.4 Macro Coordination

8.4.1 The Importance of Control

In order for a cooperative to successfully match supply with demand for an entire market, some degree of market power or control is needed. Sometimes, as is the case with supply management, control is essential. Control reduces the risk cooperatives face when they undertake

macro coordination activities. It also gives the cooperative the ability to reduce the chance of being placed at a competitive disadvantage as a result of the coordinating activities it undertakes. An example is a cooperative that possesses enough control to be able to offset the cost of providing marketwide services through over - order premiums.

The level of control needed to pursue coordinating activities varies. For some activities, such as administering a supply management program, a cooperative must dominate the market. Cooperative D may be in such a position, cooperative E was not. Cooperatives G and J lack the market power to receive adequate compensation for providing marketwide services. This may adversely affect macro coordination. Cooperatives H and I, which are in a stronger market position, are able to obtain higher over-order premiums. Also, a cooperative has to be a certain size in order to capture economies of scale.

It is difficult for cooperatives to dominate a market. This is why federations are formed. Milk, in its raw state, is basically a homogenous product. A cooperative's ability to dominate a market is limited by even a minor alternative source for processors and fluid handlers of this homogenous product. Milk is also a perishable commodity, a cooperative cannot store or hoard the product in its raw state to bid up the price.

8.4.2 Membership Issues

However, the biggest reason why a cooperative cannot dictate the terms of sale is that it cannot control supplies unless it operates in a geographically separated market, and the membership agrees to curb production. Cooperative D may be in such a position, but east of the Rockies controlling supplies via the use of a quota, Class I, or allocation program is impossible. Alternative supplies are too easily available.

If a cooperative is successful in obtaining higher prices, member producers will increase production which will have a depressing influence on future prices. Cooperatives cannot control the output levels of the member producers and therefore are constrained by the fundamental supply and demand conditions in the market area. Cooperatives, because they are responsive to the needs of their membership, must find a market for their milk.

8.4.3 Regulation

Cooperatives, because they generally lack control, have turned to regulation. Macro coordination may be improved either through changes in Marketing Orders, or through alterations in national policy. A major reason why regulation should be introduced in some instances is to have performance criteria explicitly stated. In order for a cooperative to be compensated for carrying out certain activities, it would have to meet these standards. Also,

the cost of carrying out these activities would be explicitly stated. Regulation would help cooperatives that do not have sufficient control to effectively pursue coordinating activities on their own.

However, there are disadvantages to regulation as well. While it is true that performance criteria could be explicitly stated and cooperatives would no longer be placed at a competitive disadvantage, flexibility would be lost. Taken to an extreme, if all aspects of marketing dairy products were made part of the Federal Orders, cooperatives and others would have to amend the Order every time marketing conditions changed.

An interesting aspect of each of the coordinating activities studied in this research are their policy implications. Performance would be improved if MCP systems became part of the Order. Uniformity would be assured and there would be improved enforcement of the program. This would mean that all market participants would be treated the same. Also, premiums and deductions could be equated, this is currently impossible in highly competitive areas such as those where cooperatives A and B market their milk. In addition, performance would likely be enhanced if the fluid standards were raised. There is little reason to raise the fluid standards to the level of those currently imposed in California. However, the consistency of fluid milk would be improved if the standards were raised to the

average of raw milk currently produced.

If a supply management program designed to curb chronic surpluses is to be instituted it will have to be nationwide in scope. Most of the discussion has been focused on the Federal Orders. Marketing Orders are not the instrument for eliminating interyear surpluses. Cooperatives, by themselves, do not have sufficient control over the market to administer such a program unless they operate in an isolated area. Seasonal supply management programs such as base - excess plans could be, and have been, part of the Federal Milk Marketing Orders.

Cooperatives could administer such a program if they are given the authority. They have the experience to deal with producer concerns, and administering a supply management program would be a natural extension of transporting and testing milk, and writing member checks. Currently, the vast majority of cooperatives do not possess sufficient market control to administer a supply management program. Forces beyond the cooperative's control would work to make the program ineffective.

Marketing Orders should be amended to allow cooperatives to receive payment for providing marketwide services. Performance criteria would be explicitly stated in the Order. For a cooperative to be eligible for compensation it would have to meet these criteria. If the cooperatives are compensated for performing these services

the free rider problem would be eliminated. Cooperatives would no longer bear a disproportionate share of the cost of providing these coordinating activities that have clear public good characteristics.

8.4.4 Cooperatives and the Public Sector

Cooperatives are also in some respects uniquely qualified to work with the public sector. This has definite effects on macro coordination. Cooperatives allow producers to act together and air their concerns about dairy policy and other issues. The NMPF is an example of dairy cooperatives working together to inform policymakers about dairy issues. Also, cooperatives are able to work with land grant universities to develop extension programs which help analyze the various aspects of the dairy subsector and to disseminate this type of analysis.

Dairy cooperatives may also be in an unique position to step in and provide services the public sector is no longer able to provide. Given the budget constraints various government agencies and land grant universities face, these subsector participants may reduce their coordinating activities. An example of this would be providing marketwide information. Cooperatives will likely have to step in and provide these services if the public sector reduces its role in the dairy subsector.

8.5 Synopsis

This research has uncovered two conditions and two issues involving cooperatives and vertical coordination. In order for a cooperative to be successful in undertaking coordinating activities it must have the support of its membership and at least some control over the market. If it lacks this control, regulations imposed through amendments in the Marketing Orders or changes in national policy can allow a cooperative to pursue coordination activities without adversely affecting the welfare of its membership. Cooperatives are uniquely qualified to pursue some coordinating functions.

Membership support is a necessary condition for a cooperative to undertake coordinating activities. The management of cooperatives are responsive to the concerns of their membership. Education and other types of information flows improve member - management relations. Cooperatives are excellent coordinating institutions at the micro - micro level. The management of cooperatives will not hesitate to adjust their programs to ensure membership support and approval. Without membership support, cooperatives will not perform functions that would improve micro or macro coordination.

Another necessary condition is the need for a cooperative to have a certain degree of market control and be a certain size to perform some coordinating activities.

This is particularly true for those activities that affect macro coordination. The level of control necessary to enhance coordination varies from activity to activity. If a cooperative does not possess sufficient control it may be placed at a competitive disadvantage if it undertakes some coordinating activities. This will eventually reduce the cooperative's ability and desire to pursue those activities. Examples in this research were supply management and the marketwide services. This may lead to inferior performance in the subsector.

If cooperatives lack sufficient control they can, and indeed have, turned to regulation. This regulation can protect the cooperative when it performs coordinating activities and can promote stability and uniformity in a market. This would affect micro and macro coordination. One advantage to instituting this regulation is that it would force cooperatives to meet explicit performance criteria. A disadvantage is that the cooperative's flexibility to meet changing market conditions would be reduced. The Marketing Orders should be changed to include MCP systems, payments for marketwide services, and base - excess plans. If society desires, a supply management program designed to eliminate chronic surpluses will have to be nationwide in scope.

Cooperatives are uniquely qualified to perform some coordinating activities. This makes the role of the

cooperative crucial in the coordination of the subsector at all levels. Cooperatives allow producers to work together toward common goals and gives them the ability to interact with other subsector participants. Also, cooperatives pursue coordinating activities that other subsector participants are not willing or able to pursue. Due to the large size of some cooperatives, they are able to enhance technical efficiency at the micro and macro levels of coordination by pursuing activities that exhibit economies of scale. The role of the cooperative in the subsector may become even more important if the role the public sector plays is reduced in the future.

This list of issues and conditions concerning cooperatives and vertical coordination is not exhaustive. Rather, the conditions of membership support and market control, and the issues of regulation and uniqueness were common in the analysis of the coordinating activities that were the focus of this research. Further analysis of these, or other, coordination activities may lead to the discovery of further conditions and issues facing dairy cooperatives in the coordination of the subsector.

8.6 Summary

Cooperatives are unique organizations. This uniqueness makes micro - micro coordination very important. Dairy cooperatives put the needs and desires of their membership first when undertaking coordinating activities.

This means that cooperatives place more emphasis on micro-micro coordination than micro or macro coordination.

A necessary condition for cooperatives to pursue coordinating activities is membership support. In order to obtain this support, management undertakes educational activities. There is a great deal of information that flows between the management and membership of the cooperative. These information flows help those involved with the cooperative to come to decisions concerning the goals and policies of the cooperative.

Cooperatives are uniquely qualified to perform some micro coordination activities. They provide a mechanism for dairymen to interact with fluid handlers and processors. Cooperatives act as "missing heros" in undertaking some activities that only they perform. Also, due to the economies of scale many cooperatives possess, they can perform some coordinating activities at a lower cost than other market participants.

However, cooperatives can be constrained by competitive forces. Free riders and alternative milk markets can reduce the cooperative's ability to perform some coordinating activities. Cooperatives are unlikely to perform coordinating activities if their membership is placed at a competitive disadvantage. Some cooperatives have formed federations in an attempt to eliminate some of these problems.

As a general rule, control is necessary if a cooperative is to enhance macro coordination. Performance of the case study cooperatives would improve if they had more control. This is particularly true for the MCP case studies and some of the marketwide services case studies. Almost complete market control is needed for a strong supply management program to be effective. Somewhat less control is needed for a cooperative to administer a seasonal supply management program.

Market control is difficult to obtain which has forced cooperatives to look for alternatives, particularly changes in the regulations. Performance would be enhanced if multiple component pricing, payments for marketwide services, and base - excess plans were made part of the Federal Orders. Whether or not a supply management program designed to eliminate chronic surpluses should be instituted on a nationwide level is a decision society as a whole has to make.

CHAPTER 9: CONCLUSIONS, RESEARCH RESULTS, AND TOPICS FOR FURTHER RESEARCH

9.1 The Cooperative's Place in the Dairy Subsector

Cooperatives are major actors in the dairy subsector. As noted in the first chapter, cooperatives have become the primary source of fluid milk and are also major producers of manufactured products. They have been involved with various aspects of marketing for more than one hundred years. The size and scope of dairy cooperatives are important characteristics given the coordination problems inherent in the dairy subsector.

Milk is a highly perishable and bulky product. Furthermore, the seasonality of production and consumption are not matched. Another very serious problem in the dairy subsector is the fact that many assets used in the production of dairy products are fixed, they cannot be used for anything else. There are also biological lags in dairy production that makes coordination difficult and planning for the future important. Cooperatives have undertaken a wide range of activities that address these and other problems.

9.2 Research Methods

This research stressed vertical coordination, or matching supply and demand, at three levels. The first level was coordination within the cooperative, particularly between the membership and the management; this was referred to as micro - micro coordination. The second level of coordination analyzed was matching supply and demand between cooperatives and proprietary processors and fluid handlers; this was referred to as micro coordination. The final level of coordination was matching aggregate supply with aggregate demand for a particular market; this was referred to as macro coordination.

This framework simplified the analysis and allowed the research to focus on the three major nodes of vertical coordination. Furthermore, it allowed the researcher to identify coordinating activities and issues and the various levels of coordination that were affected by the activities pursued by dairy cooperatives. This was done in the second chapter.

As Table 4 shows, cooperatives undertake a wide range of activities that affect the vertical coordination of the subsector. In order to make the research manageable three activities were selected. They were: multiple component pricing, supply management, and the marketwide services of seasonal balancing and marketwide information. These coordinating activities were selected because they

are issues of current interest to those involved in the subsector. This is particularly true of supply management and marketwide services.

The cooperatives selected were chosen for a number of reasons. The MCP cooperatives were selected because they had an historical record. Also, cooperatives that administered SNF and protein programs were selected. There are very few cooperatives that have attempted to administer supply management programs without government involvement of one form or another. The supply management programs selected in this research constitute much of the total number of cases which could have been selected.

The marketwide services cooperatives were also selected for a number of reasons. One was selected because it tried to have the Orders amended and failed in its attempt, and another was selected because it currently receives some payment from the Order for providing the marketwide services studied. The other cooperatives were selected because they undertake the marketwide services of seasonal balancing and marketwide information, and they are large cooperatives in their market area and charge over-order premiums.

There are other characteristics of these cooperatives which should be noted. All of the cooperatives are vertically integrated into some manufacturing activities, and several are involved in

handling fluid milk as well. Several of the cooperatives are the dominant source of milk in the market. Geographically, the case study cooperatives were widely dispersed, all areas of the country, with the exception of the Rocky Mountain region and California, were represented. Some of these similarities were not anticipated but likely reflect the important role dairy cooperatives now play in the subsector.

The method used to test the hypotheses was analysis by case study. Personal interviews with a wide range of cooperative management were used to collect the information to test the hypotheses. This technique allows a researcher to gain in depth information from a wide range of experiences on the coordinating activities studied. Utilizing case studies is also a natural way to conduct any type of vertical coordination research. The theory of vertical coordination is far from complete, there is no standard approach to vertical coordination issues. Using case studies applied to a particular subsector adds experience and provides information which can be used in future research efforts. It also allows others to follow and to either verify or reject the research results.

9.3 Research Results

9.3.1 Multiple Component Pricing

Several conclusions regarding MCP systems can be stated. As a result of these systems, producers have

reduced the somatic cell and bacteria counts of their milk. This has improved the quality of milk produced by the members of the case study cooperatives and has increased the productivity of manufacturing plants. This has been the primary improvement in coordination as a result of the MCP systems. There has not been any change in SNF or protein levels as a result of the programs nor has there been any change in the seasonality of SNF or protein content in milk. Currently, the expense to a dairyman of increasing the SNF or protein level in his milk does not justify itself.

Hypothesis I can be accepted in that coordination at all levels has been slightly improved as a result of the MCP systems studied. However, these systems were not instituted in order to adapt to changes in the demand for dairy products. Rather it was an attempt by cooperatives A and B to provide a pricing system that member producers wanted. Cooperative C instituted its system to improve equity amongst its member producers. It wanted to increase the returns of those producers whose milk yielded the most manufactured product.

Producer support, or at least the absence of producer antagonism, is needed for an MCP system administered by a cooperative to be successful. MCP systems have proven to be very popular with the membership of cooperatives A and B. In fact, a primary reason why

cooperative B instituted its program was to satisfy producers. Cooperatives A and B operate in very competitive markets and premiums paid to producers are greater than deductions from producers.

Cooperative C's experience is somewhat different. The impetus for this program came from the management rather than the membership. However, producers did have input in the design of the program and the program has been designed in such a way that 70 percent of the producers are not affected by the program. In cooperative C's case, deductions and premiums are approximately equal, and the MCP system is not a major issue.

Control over the market is apparently not needed to administer an MCP system. It could be argued that in the case of cooperatives A and B the MCP systems indicate a lack of market control. If these cooperatives had more market control the system would likely be administered differently. The systems were offered to please membership, and in the case of cooperative A it led to an increase in membership. Cooperative C is one of only two participants in its market area that administers an MCP system, but because there is little effect on the membership or on processors and fluid handlers, the program is not controversial nor has it led to market disruption. While market control is not needed to administer an MCP system, it is probably the case that the more control a

cooperative has over a market, the more effective an MCP system is as a coordinating mechanism.

The biggest issue with MCP systems is the potential disruption of the fluid market; this would adversely affect micro and macro coordination. This has not occurred. The fluid market is still the most profitable outlet for milk, and it is too expensive for cooperatives to differentiate between milk going to fluid and manufacturing plants. If anything, the quality of milk going to fluid markets has improved as a result of the reduced somatic cell and bacteria levels. It should also be noted that there has been little, if any, change in proprietary manufacturer operating procedures as a result of these systems.

Cooperatives are not uniquely qualified to administer these programs although there are some advantages to having them perform this task. In some areas, particularly Wisconsin, proprietary firms administer some type of MCP system. However, cooperatives, because they are responsive to member needs, may be more likely to adjust the systems. Also, they may be more likely to test milk more fairly than proprietary firms.

MCP systems are mostly a producer issue. In cases where these programs are popular with producers micro - micro coordination is improved. The primary reason why cooperatives A and B have instituted their MCP systems

is to improve member relations, not to meet changing consumer demand. This is not the case with cooperative C which instituted its MCP system to reward producers who produce milk with a high SNF content, which yields more manufactured product, and those who have low somatic cell counts. Coordination at the micro and macro levels has been improved slightly because milk quality has improved as a result of these systems. Somatic cell and bacteria levels have been reduced as a result of these systems. Government intervention through regulation of the Marketing Orders and increasing fluid standards would improve coordination at all levels.

9.3.2 Supply Management

Hypothesis II holds if cooperatives have sufficient control over the market. When cooperatives are successful in instituting supply management programs surpluses are reduced. This is true for both seasonal supply management programs such as base - excess plans or more stringent supply management programs such as allotment programs or Class I plans. This enhances technical efficiency because the need for building manufacturing plants to process the surplus milk is reduced or eliminated.

These programs must meet with the approval of the membership in order to be instituted. Cooperative D spent a considerable amount of time educating and interacting

with the membership to formulate a program that met with membership approval. Cooperatives E and F spent less time and effort on education programs because, in their cases, the membership was more aware of how the programs worked.

Barriers to entry is another issue confronting these programs. If a cooperative's program creates a disincentive for producers to join the cooperative it will lose market share. This was the experience of cooperative E. Cooperative D has designed its program so that it does not create barriers to entry. Whenever bases or quotas become transferable and obtain value, new producers are less likely to join the cooperative that administers the program. Also, nonmember producers may increase production and processors and fluid handlers may look for alternative sources of milk. Cooperative D operates in a geographically separated area and will accept new members into its cooperative. Cooperative F's program was administered in such a way that bases were adjusted annually. The effectiveness of cooperative F's program was strengthened by the fact that other cooperatives in the market operate similar programs. Bases did not have an intrinsic value and there were no barriers to producers for joining the cooperative as a result of the program.

Producers do respond to the price signals generated by the programs. The goals of cooperatives D and F were met by the program. The need to build or lease

manufacturing plants to process excess milk was eliminated. Cooperative E's program was also successful as long as it had sufficient market control. Over time however, this control was lost and the cooperative was unable to manage supplies effectively. There was too much milk from other sources. This is a problem facing all producers and cooperatives east of the Rockies. Also, while the overbase price reduced the incentive to increase production, it did not completely eliminate it. Surpluses in cooperative E's market area were reduced but not eliminated.

It should be noted that the results of cooperative D and F's programs are affected by national policies. The Diversion and DTP reduced the potential pressure on these programs. In fact, cooperative F eliminated its program because of the reduced supplies that resulted from these policies. Cooperative D also raised its overallocation price and reduced the period that overallocation milk is penalized because of the DTP. Currently, producers are penalized for producing over their allocation only in the spring.

The fact that the programs were altered as a result of the effects of national policies point out another aspect of these programs; they are adaptable to changing supply and demand conditions. Flexibility in the face of changes in supply and demand conditions also enhance coordination especially at the macro level.

Cooperative D will apparently increase allotment if the need arises. It will also change the overallocation price of milk or perhaps reduce the amount of allotment. Cooperative E also altered its program in a number of ways, but these alterations were aimed more at the cooperative keeping its market position and less in an attempt to keep supply and demand balanced. Cooperative F showed its adaptability by eliminating its program when it was no longer needed.

9.3.3 Marketwide Services

Cooperatives improve the coordination of the dairy subsector at all levels by performing the marketwide services of seasonal balancing and marketwide information. Hypothesis III holds. Seasonal balancing reduces supply fluctuations and stabilizes the market. This stability reduces price fluctuations, and the potential for over or underinvestment in dairy inputs by all market participants. Cycles of over or underproduction are reduced as a result of the cooperatives's seasonal balancing activities. Furthermore, because seasonal balancing exhibits economies of scale, coordination is improved because technical efficiencies result from one, or a few cooperatives or organizations performing this activity.

Vertical coordination at all levels is also enhanced as a result of the marketwide information services

that cooperatives perform. These services reduce uncertainty and improve the decisionmaking abilities of all subsector participants. This adds stability to the subsector, and reduces price fluctuations. Planning by subsector participants is improved and the voice of dairy farmers is strengthened on the national level by some of the information activities that cooperatives pursue. Chapter 7 deals with the various types of information services that the case study cooperatives provide in greater detail.

In order for cooperatives to provide these services, there must be member support. This is particularly true if the cooperative is placed at a competitive disadvantage. The membership of the cooperatives studied in this research are fairly aware of the issues and problems the cooperative faces when pursuing these balancing activities.

The biggest problem the cooperative faces is the free rider. There are three types of free riders: nonmember producers, limited service cooperatives, and processors and fluid handlers. Marketwide services have the public good characteristics of being high exclusion cost, and joint - impact goods. This makes it possible for others to free ride on the cooperative's activities. Some cooperatives are able to charge over - order premiums which help compensate cooperatives for providing marketwide

services, but there is still an incentive for nonmember producers not to join the cooperative, and there is also an incentive for members to leave the cooperative.

This fact makes it difficult for cooperatives to perform these services. Cooperative G attempted to amend several Milk Marketing Orders but was unsuccessful; it may curtail the services it provides as a result. Cooperative J is not able to be fully compensated for providing these services. If it did, the cooperative would likely improve its marketwide information activities. Cooperatives H and I are the largest cooperatives in their respective markets, the free rider is less of an issue with them. This is particularly true for cooperative I, which is part of the CMPC and is able to negotiate high over - order premiums and operates in a market where the vast majority of producers belong to cooperatives that make up the CMPC.

The cooperative's position in providing these services is an unique one. The fact that there are economies of scale in performing seasonal balancing activities has already been mentioned. If cooperatives did not perform the marketwide information services the information would tend to fall into the hands of proprietary firms. Cooperatives help provide a "level playing field" between producers and proprietary firms. Also, the cooperative's role in providing marketwide information may become even more important should

government agencies and the extension service cut back on the information services they provide.

9.3.4 Recommendations

MCP systems have come into existence and are now firmly established without being incorporated into the Federal Milk Marketing Orders. However, performance would be improved if the MCP systems became part of the Orders. Uniformity would be improved and there would be improved enforcement of the program. Furthermore, all market participants would be treated the same. Also, premiums and deductions could be equated. This is currently impossible in highly competitive markets such as those in which cooperatives A and B operate. In addition, performance would likely be enhanced if the fluid standards were raised. There is little reason to raise the fluid standards to the level of those currently enforced in California. However, the consistency of fluid milk would be improved if the standards were raised to the average of raw milk currently produced.

Most MCP systems have become a way to gain or keep producers rather than a method of enhancing coordination. Making MCP systems part of the Orders would improve uniformity and would be a mechanism for making the system a method to ensure that milk has the characteristics that consumers and processors desire rather than a pricing gimmick. Making MCP systems part of the

Order would eliminate this deficiency.

Whether or not supply management should become part of the dairy subsector depends on the policy goals of society. The program would have to be nationwide in scope to be effective. An exception is supply management programs in geographically separated markets. Seasonal supply management programs such as base - excess plans could be, and have been, part of Federal Milk Marketing Orders, but any program that would curb chronic surpluses will have to be nationwide. It is likely that a good opportunity to institute a supply management program was lost after the DTP. A quota or other type of program could have been instituted while supply and demand were relatively closely matched. This opportunity may not present itself again in the near future.

Cooperatives could administer such a program if they are given the authority. They have the experience to deal with producer concerns, and administering a supply management program would be a natural extension of transporting and testing milk and writing member checks. Currently, the vast majority of cooperatives do not possess sufficient market control to administer a supply management program. Forces beyond the cooperative's control would work to make its program ineffective.

Marketing Orders should be amended to allow cooperatives to receive payment for providing marketwide

services. A major reason is that performance criteria would be explicitly stated in the Order. For a cooperative to be eligible for compensation, it would have to meet these criteria. Also, if cooperatives are compensated for performing these services, the free rider problem would be eliminated. Cooperatives would no longer bear a disproportionate share of the cost of providing the coordinating activities that have public good characteristics.

9.4 Further Aspects of Cooperatives and Coordination

9.4.1 Micro - Micro Coordination

One of the most obvious results of this research is the cooperative's need for member support. The management of the cooperatives studied are sensitive to producer concerns. Without membership support, neither the MCP nor the supply management programs would have been instituted. These programs were adjusted to meet with member support. It was also the case that cooperatives allowed the membership to vote on these programs and received feedback from the membership on these programs. There is also membership support for the marketwide services the case study cooperatives perform.

Cooperatives can alter their programs to meet with member approval. This can have an adverse effect on coordination. This is the case with cooperatives A and B's MCP systems. Cooperative C, in an attempt to reduce member

resistance, designed its program in such a way that the majority of producers were not affected. The supply management cooperatives were also responsive to the concerns of the membership when their supply management programs were instituted and also adjusted them to meet with membership approval.

Cooperatives are a unique form of organization. The management of the cooperatives interact with their membership and are very reluctant to place their membership at a competitive disadvantage. This has effects on the cooperatives's ability to enhance coordination of the market. Cooperatives are likely to pursue coordination activities with less vigor than they otherwise would if these coordinating activities place them at a competitive disadvantage. This was particularly true in the marketwide services case studies, and to a degree cooperative E's supply management program.

9.4.2 Micro Coordination

Cooperatives appear to act as "missing heros" by performing some coordinating activities that proprietary firms are unwilling or unable to perform. This makes the cooperative's role in coordinating the subsector crucial in improving performance. An example of this is providing marketwide services which not only improve the welfare of the membership but also fluid handlers, manufacturers, and other subsector participants.

Many cooperatives are also quite large. Cooperatives handle most of the milk produced at one level or another and are actively involved in many manufacturing activities. Due to this fact, cooperatives are uniquely qualified to perform some of the coordinating activities that exhibit economies of scale. This enhances technical efficiency. The marketwide service of seasonal balancing is a good example. The size of many cooperatives point out another condition for coordination, that of market control.

Some cooperatives, in particular, those who operate in the Chicago Milk Marketing Order region, have formed cooperative federations in an attempt to increase their control at the micro and macro levels of coordination. This is a type of horizontal integration. Due to the fact that the CMPC includes the largest cooperatives in the market, it is able to negotiate a high level of over - order premiums, part of which go to pay for marketwide services. Another such federation is the RCMA which is based in the Northeast. This cooperative federation is less effective in negotiating over - order premiums because there are more nonmember producers in this market.

9.4.3 Macro Coordination

Some degree of market control is needed for most of the coordinating activities cooperatives perform in the dairy subsector. This is important if cooperatives are to

play a role in enhancing macro coordination. One of the reasons MCP systems are not as effective as they could be for cooperatives A and B is that they lack this control. The lack of sufficient control was the fundamental reason why cooperative E's supply management program was eliminated. Cooperative D may have sufficient market control to effectively administer its supply management program. Cooperative F had sufficient control to administer its program because less control is needed to administer seasonal programs, and because other cooperatives in this market area also used some type of seasonal supply management program. In order for cooperatives to have the ability to perform many marketwide services they must also have some degree of market power. The free rider problem is less of an issue in markets that are dominated by a large cooperative or a cooperative federation.

The necessary level of control needed varies from activity to activity. For some coordinating activities, such as supply management, a great deal of control is needed. For others, such as MCP systems, much less is required.

If cooperatives lack sufficient market control they can try to change various regulations and policies. One finding of this research is that uniformity and stability would be improved if the Orders were amended to

include MCP systems. If supply management is to be effective, a national program would likely have to be instituted. Marketing Orders are not the proper instrument for a strong supply management program designed to eliminate chronic surpluses.

Of all the coordinating activities studied, regulation would play the biggest role in marketwide services. Making payments for marketwide services part of the Federal Orders would reduce, or eliminate, the free rider problem. Cooperatives would no longer be placed at a competitive disadvantage for providing these services. Also, making payment for providing marketwide services part of the Orders would explicitly state the performance criteria that the cooperative would have to meet in order to be compensated. However, regulation should be used with care.

There is a tradeoff between the benefits of regulation and flexibility. If all cooperative, or for that matter all dairy subsector, activities were regulated it would be difficult to adjust to changing supply and demand conditions. Cooperatives have proved themselves to be flexible in regards to all the activities studied and some of this flexibility may be lost if regulation concerning these activities is introduced.

9.5 Further Research Needs

There is more need of quantitative work concerning cooperatives and vertical coordination. Much of the work involving these areas has been descriptive in nature. One of the benefits of this research is that the marketwide services of seasonal balancing and marketwide information have been thoroughly discussed and analyzed. There needs to be some quantitative research concerning such issues as the optimum level of marketwide services provided and the payment that cooperatives should receive from the Order pool to complement this research. Also, perhaps some cross cultural research concerning supply management in the U.S. vis a vis other countries would also be useful.

Another research area that should be explored is further research into the coordinating activities cooperatives perform. Table 4 in Chapter 2 outlined a wide range of activities dairy cooperatives undertake. Research into these activities may uncover more aspects concerning dairy cooperatives and vertical coordination. Further research into dairy cooperatives and the various coordinating activities they pursue would add evidence to support or reject the conclusions this research has reached.

There is also a very critical need for further development of the theory of vertical coordination. There

has been a great deal of applied research on various subsectors concerning vertical coordination but the concept itself remains nebulous. Currently a researcher can determine various degrees of "good" or "bad" coordination based on various performance goals but the nature and theory of vertical coordination remains very underdeveloped. All research in areas such as those discussed within these pages would benefit from improved theories of vertical coordination.

9.6 Final Statement

This research focused on the dairy cooperative's role in the vertical coordination of the subsector. It analyzed three coordinating activities that dairy cooperatives perform by using case studies. It was determined that coordination at all levels is improved somewhat via MCP systems because the quality of milk has improved. Also, technical efficiency is improved and surpluses can be reduced through supply management programs administered by cooperatives. The marketwide services of seasonal balancing and marketwide information also enhance vertical coordination at all levels by reducing uncertainty and adding stability to the subsector in a cost effective manner.

This research uncovered four aspects concerning cooperatives and vertical coordination. In order for a cooperative to effectively enhance vertical coordination,

it must have the support of the membership and at least some degree of market control. It was determined that cooperatives are uniquely qualified to perform some coordinating activities. Also, in order for cooperatives to perform some coordinating activities, especially if they lack sufficient market control on their own, regulations such as Marketing Orders, or national policy, have to be changed.

APPENDIX

APPENDIX

MCP QUESTIONNAIRE

I. General Questions

1. Make sure background information is correct.

2. Effects on net income (producers and manufacturers).

3. How is the system funded.

II. Micro - Micro

1. Producers education and feedback.

2. Is it still an issue.

3. Lost membership; still in market; join another coop; why left (SNF, protein or quality).

4. Changed production habits (SNF, protein, or quality).

III. Micro

1. Manufacturers and fluid processor response.

2. Outside sources of milk (did they obtain adequate supplies).

3. Other organizations and MCP (are coops uniquely qualified).

4. How have manufacturers and fluid processors changed their operating procedures as a result of the program.

IV. Macro

1. Has there been a disruption of the fluid market (what has the coop done to eliminate this problem).

2. Have manufacturers and fluid processors been willing to pay for the increased quality.

3. Should the solids standards be raised.

4. Should MCP be made part of the Marketing Order.

5. How are the premiums determined.

6. Has the seasonality of SNF or protein been reduced.

7. Other problems faced by the coop.

SUPPLY MANAGEMENT QUESTIONNAIRE

I. General Questions

1. Rationale for the program.

2. Price of excess milk.

3. Price of quota or base.

4. Level of control in the market.

5. Qualifications of the cooperative to manage supplies.

II. Micro - Micro

1. Member education and initial response.

2. Member feedback.

3. Lost membership to other coops (new entrants not join).

4. Did nonmembers increase production (what was the effect).

5. Did quota or base transfers encourage high cost producers to leave the market.

6. How are bases or quotas transferred.

III. Macro

1. Is the overproduction price low enough to discourage production.

2. Does the cooperative have enough control over the area (including processors and fluid handlers) to manage supply.

3. Are fluctuations in supplies and prices reduced (evidence).

4. For supply management to be effective will the Marketing Order have to be amended.

5. Is the program flexible to changes in demand.

6. What other problems or issues did the cooperative face.

7. Why did the cooperative eliminate the program.

MARKETWIDE SERVICES QUESTIONNAIRE

I. General

1. What balancing activities does the coop undertake and what does it cost (estimates).

2. What marketwide information activities does the coop undertake and what does it cost (estimates).

3. What other organization has, or could, provide these services.

II. Micro - Micro

1. Is there membership support for these services.

2. Have members left the coop because of these services.

3. Have producers not joined the cooperative because they free ride.

4. How has marketwide information improved the decisionmaking abilities of producers.

5. How much of the cost of these services is borne by the coop.

III. Micro

1. How does marketwide information affect the decisionmaking abilities of processors and fluid handlers.

2. What would happen if the coop stopped providing these services.

3. Do free riders (other coops, manufacturers and fluid processors) reduce your ability to provide these services.

IV. Macro

1. Is the cooperative in favor of being directly compensated for providing these services (how would its behavior and level of over - order premium change).

2. Is the coop going to attempt to have the Marketing Order changed so that it is compensated (how will its behavior change if its attempt is unsuccessful).

3. What forms of marketwide information help match supply with demand.

4. What additional problems does the cooperative face when undertaking marketwide services.

5. Why was the coop unsuccessful in getting the Order amended.

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