

The Role of Cooperatives in Milk Marketing

Christopher A. Wolf* and Larry G. Hamm

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Department of Agricultural Economics
Michigan State University
East Lansing, MI 48824

*Phone: (517)353-3974
Fax: (517)432-1800
e-mail: wolfch@pilot.msu.edu

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Abstract: Recent changes in dairy industry structure and policy have brought the role of cooperatives into question. Analysis of milk marketing institutions and their association with cooperative marketing functions sheds light the interdependency of government involvement in milk marketing. We examine the role of cooperatives to determine whether cooperative market power can substitute for public policy power. The ability of cooperatives to maintain membership and balancing services depends critically on the dairy policies in place today. In absence of milk marketing orders, we find it likely that cooperatives will be unable to maintain these services.

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Introduction

Economic models of dairy markets often ignore cooperatives, yet dairy cooperatives market the majority of the milk produced in the United States. The debate among economists surrounding federal milk marketing order reform has involved the consequences of a movement to a milk market without government intervention and the question of whether cooperatives could replace government marketing orders (*Choices*, Third and Fourth Quarters, 1997). Regardless of the outcome of marketing order reform, the role of cooperatives is changing as the price support program is phased out and structural change continues.

Milk has characteristics that differentiate its marketing from other agricultural commodities. The perishable and flow nature of milk production put an independent farmer at a distinct disadvantage in marketing milk to processors and make it more likely that farmers will cooperate. Milk marketing cooperatives, or groups of cooperatives, often secure a fluid milk price above federal order minimum prices through collective bargaining. Cooperatives operate within a dairy policy context that includes milk marketing orders, the price support program, trade programs, and generic commodity advertising. The effectiveness of cooperative action is determined by their ability to maintain membership and pool milk revenues to eliminate incentive for independent processors (or specialized or captive cooperatives) to undermine the cooperative price margin.

This conceptual paper considers the important influence of cooperatives in dairy marketing and addresses considerations relating to their ability to operate without government intervention. The potential of dairy cooperatives to operate without government intervention is difficult to discover because we are asking a counterfactual question: what would happen to

dairy cooperative operations without milk marketing orders? Because we cannot observe an alternative that does not exist, we concentrate on the interdependence between dairy cooperatives and dairy policy, most importantly milk marketing orders, in the marketing system that exists today. The role of cooperatives has been examined by economists in the past (Masson and Eisenstat; Jesse and Johnson; Gardner et al.; Masson et al.). Previous research has focused on the use of cooperative market power and its appropriateness. Here we take a different approach by discussing whether private cooperative power can substitute for public policy power.

Milk Marketing Today

One common notion about milk marketing is that it is likely to become more like other agricultural commodities (e.g., use futures market as a price discovery vehicle). However, milk possesses unique properties that have kept milk marketing from converging to other commodities' marketing procedures in the past and may do so in the future. Unlike most agricultural commodities milk, in its fluid form, can be stored only a few days. Historically, the farmer who concentrated on producing milk without a direct customer sales enterprise was at the mercy of the handler or processor in price bargaining. This bargaining disadvantage was addressed in the early part of the twentieth century by the creation of marketing cooperatives and milk marketing orders. A second, unique characteristic of milk is that it is a flow product. Whereas, most crops are harvested once a year and may be stored for sales throughout the year, milk is harvested at least twice a day. A third characteristic is that milk leaving the farm is a fairly homogeneous product but as used in manufacturing milk components and their value vary widely. Most cooperatives, processors and other handlers produce several products each of which is composed of a different ratio of fat, solids-not-fat, and water. These products have different demand elasticities and prices so that pooling milk revenues and paying an average, or

blend, price developed. A fourth unique characteristic of milk is the counter-cyclical nature of supply and demand peaks. Milk production peaks in spring and early summer when fresh forages are available to feed the herd. Milk consumption peaks in the fall and winter when school lunches and holidays are responsible for large amounts of consumption. This discrepancy in production and consumption peak results in a large amount of milk that needs to find a home in the spring and a cyclical milk price. The combination of the flow nature of milk, the potential for spoilage, lack of a standard value unit, and unsynchronized supply and demand cycles make milk marketing unique and lead to the milk marketing system and institutions that exist in the United States today.

Dairy Pricing and Policy

Dairy policy in the United States consists of five program areas: milk marketing orders, the Capper-Volstead Act, the price support program, generic commodity advertising, the Dairy Export Incentive Program, and tariff-rate import quotas. This paper assumes a basic understanding of each and highlights aspects of federal marketing orders, anti-trust legislation, and generic commodity advertising that involve or affect cooperative functions as needed (for a complete review of U.S. dairy policy see Manchester or Bailey).

Milk marketing orders are rules under which milk is priced and pooled. Most of the milk produced in the United States is marketed through a state or federal milk marketing order. Milk marketing orders have two important policy instruments: classified pricing and pooling. Classified pricing sets minimum prices for milk based on the end product. In this way, highly perishable fluid milk with a very inelastic demand—Wohlgenant, and Johnson, Stonehouse, and Hassan suggest estimates of elasticity of demand for fluid milk of approximately -0.3—receives the highest price while storable manufactured products with a more elastic demand, such as

cheese and butter, receive lower prices. Fluid milk is bulky and expensive to transport so the fluid markets are regional. Manufactured dairy products are easily shipped between markets so the manufactured dairy product market is national. Pooling sums all milk revenues in an order and pays each producer in that order a weighted average price called a blend price. Market-wide pooling is facilitated by the government's ability to audit the books of handlers and require participation by producers and processors.

Cooperatives were given the ability act as cartels by the Capper-Volstead Act of 1922. The Capper-Volstead Act allows farmers to act together without anti-trust concerns. Milk marketing cooperatives, or groups of cooperatives, often secure a fluid milk price above federal order minimum prices. This return above mandated minimum price is referred to as an over-order payment or premium.

Milk producers and consumers derive many benefits from the current milk marketing institutions including:

1. *Orderly marketing.*

Orderly marketing includes coordinating buyers and sellers, balancing surplus milk, and minimizing price fluctuations.

2. *Health and food safety.*

The properties of milk that make it perishable also make it a potential carrier of illness. Public inspection and policing by government agencies minimizes health concerns.

3. *Bargaining equity/income distribution.*

The characteristics of milk discussed earlier make it necessary for cooperation to occur among milk producers if they are to capture surplus rents from processors or wholesalers. Cooperative action and marketing orders alleviate market power discrepancies between

atomistic producers and large buyers. The rents captured by farmers distribute wealth in farm and rural communities.

4. *Data and knowledge of the market.*

The federal milk marketing order system generates substantial data that indicate market conditions. This information allows informed decisions by farmers, processors, retailers, consumers, and economists.

The next section examines cooperatives and explains their dependency on marketing order policies.

Milk Marketing Cooperative Functions and the Role of Policy

Milk marketing cooperatives are organizations comprised of farmers that collectively market their milk. These cooperatives are not homogenous organizations. Cooperatives differ in size, form and function across and within regions and orders in the United States. An important distinction for our analyses is a “bargaining” cooperative versus a “balancing” or “processing” cooperative. “Bargaining” cooperative denotes an organization that collectively markets milk to handlers and processors while a “balancing” cooperative bargains for price, often in high-priced fluid and soft product markets, and also possesses manufacturing capacity to perform its own balancing. This distinction becomes important when discussing cooperative dependence on policy.

Milk marketing cooperatives formed in the last part of the nineteenth century and early part of this century to provide some bargaining power for dairy farmers. As table 1 illustrates, dairy cooperative market share of milk marketing has grown in recent decades. In 1994, 86 percent of milk was marketed through a cooperative up from 48 percent in 1936.

Cooperatives perform several functions including:

1. Act as agents of the producers in bargaining for prices with processors and distributors.
2. Guarantee producers a market for their milk.
3. Check weights and tests of producer's milk.
4. Ensure distributor payment to producers.
5. Furnish market information (Gauinmitz and Reed).

The primary goal of cooperative marketing is to enhance farmer pay prices. Unique legislation allows cooperatives to use several tools to enhance pay prices and assets including:

1. *Collective bargaining to bid up the price of milk.*

By acting together, farmers no longer face a single, relatively elastic demand curve for their milk. Cooperatives and federations of cooperatives, known as marketing agencies in common, act to extract rents from the inelastic fluid market. These over-order premiums take advantage of the inelastic demand for fluid milk to transfer revenue to farmers that would otherwise go to processors or retailers.

2. *Bloc voting privileges which allow them to affect any votes on federal milk marketing orders.*

Cooperatives carry substantial political clout. Cooperatives vote for their members based the action that benefits the whole. Marketing orders require approval of at least one-half of the affected producers with two-thirds of the production or two-thirds of the producers with at least one-half of the production to come into existence. The voting requirement for orders makes it possible that large cooperatives can control policy changes.

3. *Cooperatives are considered a single producer under federal orders therefore can pay members below minimum order class prices.*

While all independent handlers and processors must pay at least the minimum price for each

class of milk, cooperatives may pay below the minimums because they are considered a single producer. The practice of paying below minimums is constrained by the potential defection of producers to independent handlers.

4. *Cooperatives may pool milk across orders/markets.*

Cooperative membership need not follow the artificial boundaries set up by marketing orders. Cooperatives may pool milk across orders where they collect producer milk to take advantages of price and utilization situations.

These tools are largely functions of the policies that exist today. The next section examines cooperative functions without marketing orders.

Cooperative Milk Marketing in a Changing Policy Context

The debate about federal milk marketing order reform that surrounded the 1996 FAIR Act was fierce. The economics of the resulting phase-out of the Price Support Program and restructuring of the federal marketing orders are likely to be debated for years to come. One popular contention in the debate has been that cooperatives could perform the functions that marketing orders currently perform. In the framework of the policy and cooperative tools and functions defined above, we examine several specific hypotheses that are subsets of the larger question regarding milk marketing cooperative ability to replace milk marketing order functions.

The policy situation we consider is the elimination of milk marketing orders. We examine the way cooperative functions depend on marketing order policy assuming the price support program is eliminated but the Capper-Volstead cooperative exemption from anti-trust prosecution still exists. We do not consider the possibility of state orders replacing federal orders.

Null Hypotheses: In the absence of marketing orders

1. *Cooperatives can capture rents from processors and give them to producers.*
 - a. *Cooperatives can maintain classified pricing.*
 - b. *Cooperatives can extend over-order pricing.*
2. *Cooperatives can deal with the free-rider problem.*
3. *Cooperatives can maintain balancing services.*
4. *Cooperatives can generate sufficient data and information to police the milk marketing system.*

In the absence of marketing orders, cooperatives would maintain individual handler pools (i.e., pay a blended price to all members), as they do today, but private, investor owned firms (IOF) would have the option to pay based on end-use, individual handler pools, or some other criterion that benefits them. Differing elasticity of demand for the end-products of milk would still exist. That is, fluid milk would still generate higher prices at the retail level and the rents from fluid demand would be extracted from consumers even without formal classified pricing. A recent Cornell study supports this assertion concluding that a price surface for fluid milk would exist nationally in the absence of all government policy (Pratt *et al.*).

The first hypothesis addresses whether farmer cooperatives, and therefore the farmer, would realize the fluid milk rents without market-wide pooling and minimum class prices. Several analyses of the U.S. dairy industry in the absence of government regulation have concluded that a single farmer pay-price would result (Siebert *et al.*; Cox and Jesse). The implication is that fluid milk price would decline and manufactured milk price would increase at the farm level.

The validity of the first hypothesis and its sub-hypotheses revolves around the market power that cooperatives, and federations of cooperatives, possess. Past research has been inconclusive as to whether cooperatives wield market power under the current system (Madhavan and Eisenstat; Jesse and Johnson; Masson *et al.*). The absence of marketing orders means that investor owned firms (IOF) that handle and process milk will not be bound by minimum classified prices. However, if IOFs do not pay a price equal to the cooperative pay price, then farmers can be expected to join cooperative marketing. The result being that if cooperatives and IOFs market the same utilization of milk, then the prices will be identical (this assumes that pay prices would differ between fluid and manufactured use milk). Cooperatives have a lower fluid utilization than IOFs (see table 2) as they guarantee their farmers a market and therefore often operate manufacturing plants to handle milk production in excess of fluid contracts. IOFs purchase only the needed amount of milk and some handle only fluid accounts.

The second hypothesis, that cooperatives can deal with the free-rider problem, relates to the ability of farmers who market milk to independent processors to realize benefits from cooperative bargaining. Under the current system, over-order premiums can be used to illustrate the free-rider problem. Cooperatives, or groups of cooperatives, collude to capture fluid rents. The bargaining of the cooperatives often draws IOFs into the over-order scheme to secure a supply of milk. The over-order agreement can be viewed as a public good for farmers in the marketing area. The farmers who market to independent handlers derive the benefits of the cooperative bargaining without having capital tied up in a cooperative. Without marketing orders, a farmer would be required to belong to a cooperative to derive the bargaining benefits and the cooperative pool price. However, cooperative membership may not be stable as independent fluid processors will be able to pay a slightly higher price than a cooperative that

balances with manufactured products. In this case independent processors will retain the residual fluid rents as profits. A simple game-theoretic framework shows that the optimal farmer strategy is defection from the cooperative in the short run (Stataz). Should cooperative membership remain stable or increase, another possibility is for individual handlers to set up a “captive” cooperative, a cooperative in name only, to funnel the milk directly to their processing facilities.

The stability of cooperative membership and the viability of captive is also affected by the trend toward fewer, larger farms. If all dairy farms are large then an IOF captive cooperative becomes easier to implement. This paper does not address the important issue of structural change on cooperative milk marketing.

The third hypothesis, that cooperatives can maintain balancing services, relates to the cooperative’s ability to profitably dispose of milk in excess of fluid uses in manufactured products. Currently, cooperatives, with no means of supply control, guarantee a market for any and all member milk production. Balancing cooperatives maintain excess manufacturing capacity to handle peak milk production. IOF handlers often count on cooperatives to balance supply and demand by seasonally contracting with cooperatives for milk supply. Without federal orders to pool milk across regions, cooperatives may require a higher return on capital in manufacturing facilities. The possibility of disruptions in balancing enhances the likelihood of large seasonal swings in milk price at the farm and retail level.

Price instability has several possible negative effects on the economy. First, if the price signals are temporary but construed by farmers and handlers to be permanent, then resources will be misallocated. Second, if prices break thresholds that change consumption or marketing patterns, industry sales and consumption may be permanently lost. Third, the cost of risk management, mitigating the price swings, at the farm level would likely be accounted for in

consumer prices. The result of this increased price instability is that, should cooperatives continue the crucial job of balancing production, the milk cost will increase to reflect the higher costs of risk mitigation strategies without marketing orders.

The final hypothesis, that cooperatives can generate sufficient data and information to police the system, depends on their ability to maintain or expand membership. If the cooperatives maintain or expand membership such that they are the dominant firms in the sector, then they may not be averse to sharing information. However, it is more likely that cooperatives would not be willing to lend any information to IOF competitors and the public and economists will be left speculating on the market parameters that are easily accessible today.

Summary and Conclusions

Cooperatives play an important and often ignored role in milk marketing. This paper examined potential of dairy cooperatives to operate without marketing orders. Because we could not observe an alternative that does not exist, we concentrated on the interdependence between dairy cooperatives and marketing orders, in the marketing system that exists today. While previous research focused on the use of cooperative market power and its appropriateness, we examined whether private cooperative power could effectively substitute for public policy power.

The ability of cooperatives to maintain membership and balancing services depends critically on the dairy policies in place today. Milk marketing orders assist cooperatives by policing the system and auditing the books. The existence of market-wide pooling of revenues mitigates the free-rider problem that cooperatives face while the ability to operate an individual pool inside the order is another advantage cooperatives have under the current system. In absence of milk marketing orders, we find it likely that cooperatives will be unable to maintain these services without substantial increase in cost.

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Table 1. U.S. Milk Production and Cooperative Marketing, 1935-94

Year	U.S. Milk Production ¹ Million pounds	Coops. ²	Coop. Members ²	Milk Marketed by Coops ² Million Pounds	Coop Share of Milk Marketed ² Percent
1935/36	102,410	2,270	720,000	31,058	48
1943/44	118,555	2,286	702,000	NA	NA
1956/57	125,474	1,746	777,240	53,038	59
1964	126,967	1,244	561,085	76,743	67
1973	115,491	592	281,065	83,227	76
1980	128,425	435	163,549	95,634	77
1987	142,709	296	120,603	142,709	76
1992	148,313	265	110,440	148,313	82
1994	151,747	247	124,666	151,747	86

Source: ¹USDA. *Agricultural Statistics*, various years; ²Manchester and Blayney.

Table 2. Cooperative Share of Dairy Product Production, 1957-1992

Product	1957	1964	1973	1980	1987	1992
Butter	58	65	66	64	71	65
Natural Cheese	18	21	35	47	45	43
Nonfat dry milk	57	72	85	87	91	81
Cottage Cheese	14	15	13	22	13	13
Ice cream	45	5	5	11	8	10
Dry whey	NA	NA	NA	81	53	48
Packaged fluid milk products	NA	9	12	16	14	16

Source: Manchester and Blayney.