DAIRY MARKETS
And POLICY
ISSUES AND OPTIONS

M-7

February 1995

# THE NATIONAL CHEESE EXCHANGE: IMPACTS ON DAIRY INDUSTRY PRICING

*Larry G. Hamm and Robert March**

***Introduction***

At 10:00 a.m. each Friday in Green Bay, Wisconsin, members of the National Cheese Exchange (the Exchange) meet to buy or sell cheese. Trading takes place in carlot units (38,000-42,000 pounds) of cheddar cheese; either in the form of 40-pound blocks or 500-pound barrels. The trading session lasts approximately 30 minutes (longer if necessary). The closing prices are published and widely circulated throughout the dairy industry, and are used as the basis for buying and selling cheese throughout the food distribution system.

Because Exchange prices influence the value of over 6 billion pounds of cheese manufactured and most of the 150 billion pounds of milk produced in the United States, there is a great deal of interest in the trading on the Exchange and in how well the prices generated reflect changing supply-demand conditions for cheese. This leaflet examines how the Exchange works and some issues related to its operation.

***What is the National Cheese Exchange?***

The National Cheese Exchange is a private non-profit corporation operating in Green Bay, Wisconsin. Wisconsin is the nation's leading cheese-producing state, and Green Bay is located in the heart of a heavy cheese-producing area. The Exchange was established in Plymouth, Wisconsin, in 1918 and at the time was known as the Wisconsin Cheese Exchange. Around that time, a number of similar exchanges had been formed or would form. Perhaps the first exchange of this type was established in 1871 in Little Falls, New York. A cheese exchange was established in Cuba, New York, in the early 1900s. Over time, the Wisconsin Cheese Exchange became the dominant location and the industry recognized the advantage of consolidating exchange activities in Wisconsin. The name of the Wisconsin Cheese Exchange was changed in 1975 to the National Cheese Exchange and it moved to Green Bay. Unless otherwise directed by the Board of Directors, it meets at 10:00 a.m. each Friday. There are about 40 members who pay annual dues of $500. Anyone can become a member of the Exchange subject to approval by the Board. The 40 members market about 80 percent of the cheese produced in the United States.

There are a number of rules governing trading on the Exchange. These rules define variety and style of cheese which may be traded as well as other details of trading. Exchange prices are f.o.b. the seller's warehouse. Cheese traded must be USDA grade A, or extra grade quality; or Wisconsin State brand quality. Quoted prices do not include allowances for transportation, freight differentials, adjustments for moisture content, clearing charges, or barrel deposits, but such allowances are provided for when a sale is consummated. Only cheese produced in USDA surveyed and approved plants may be sold on the Exchange. The rules of the Exchange are very stringent with regard to payment and proof of transaction occurrence. Procedures exist for the arbitration of disputes and adjustment of damages that may occur between traders.

The Exchange comes under the direct regulation of the Wisconsin Department of Agriculture, Trade, and Consumer Protection and the Wisconsin Attorney General. In addition, because trading involves interstate commerce, conduct of the Exchange falls under the jurisdiction of the Federal Trade Commission and the U. S. Department of Justice. (The Exchange is not a

*The authors are, respectively, Professor in the Department of Agricultural Economics at Michigan State University, and Dairy Economist, USDA, retired.

*This paper is part of a series entitled "Dairy Markets and Policy—Issues and Options," a project of Cornell University's Program on Dairy Markets and Policy.*

futures market, and is therefore, exempt from regulations of the Commodity Futures Trading Commission.)

***Function of the Exchange***

The Exchange plays an important role as an alternative market for cheese and an alternate source of supplies for members of the Exchange. Trading on the Exchange is heaviest during periods of time when some difference of opinion exists as to market values of cheese. At certain times buyers may be unable to buy cheese on the "open market" from usual sources of supply at normal mark-ups; or may be unable to sell surplus cheese on the "open market" at normal mark-ups. Under these circumstances buyers and sellers use the Exchange as a source of supplemental supply, or as an outlet for surplus cheese. It is this type of trading which brings about adjustments in the market price.

An important element of the buying and selling of cheese on the Exchange is that it provides a means for large buyers and sellers of cheese to openly post opinions as to the value of cheese, and changes in the value of cheese. It is general industry practice to use the closing value of the cheese price on the Exchange to set prices for cheddar cheese, barrel cheese, and mozzarella cheese sold in the U.S. The Exchange is generally used to set market prices from Friday to Thursday, with a small mark-up added on.

***Operation of the Exchange***

At the opening of each trading session, the presiding officer calls for offers and bids on cheddar cheese in 40-pound blocks or 500-pound barrels in carlot quantities (approximately 40,000 pounds).

All offers to sell cheese or bids to buy cheese and sales are posted on boards in the trading room. Once offers or bids are posted, they become effective, but they may be later reduced, increased or withdrawn.

A general understanding exists as to how sales, offers and bids are interpreted in reporting the cheese market for the week. The last sale is considered to represent the "market" for the coming week except that a subsequent bid higher than the last sale, or a subsequent offer lower than the last sale, is considered to be indicative of the market. An unfilled bid higher than last week's price implies that the higher price is still too low to entice sellers to sell. An offer lower than last week's price suggests that the price is still not low enough to entice buyers to buy. If there are no bids, offers or sales the market is considered to be unchanged. Bids are indicators of willingness to buy and offers are indicators of willingness to sell. A review of the trading on the Exchange on a day-in, day-out basis provides some insight as to how the trading process works.

Recording the activity from an actual trading day, five firms were engaged in the trading. These firms may be identified as Traders A, B, C, D and E. Trader A was a dairy cooperative; Trader B was a proprietary cheese distributor; Trader C was a proprietary cheese and food distributor; Trader D was a proprietary cheese and food distributor; and Trader E was a dairy cooperative.

The previous week's market was $1.21 for 40-pound blocks and $1.15 for barrels. The trading can be summarized as in the chart at the bottom of this page.

As a result of the trading, the barrel cheese market was reported as unchanged and the 40-pound block market increased $.0525.

Traders A and B bid for two cars of blocks at $1.21 early in the trading session. The previous week's market price was $1.21. Since no one filled the bids, A and then B increased their bids for two cars of blocks from $1.21 to $1.2125, and then Trader A again increased its bid from $1.2125 to $1.2150. At this point, Trader C filled Trader A's bid for two cars of blocks to

| Sales | Cars | Product | Price | Seller | Buyer |
|---|---|---|---|---|---|
| Bid Based | 2 | Blocks | $1.2150 | C | A |
| | 2 | Blocks | $1.2200 | C | A |
| | 2 | Blocks | $1.2400 | C | A |
| Offer Based | 10 | Barrels | $1.1500 | C | D |
| Unfilled Bids | 2 | Blocks | $1.2625 | C | A |
| | 2 | Blocks | $1.2625 | C | E |
| Uncovered Offers | 5 | Barrels | $1.1500 | C | E |

Market Summary ($/lb)

| Product | Today | Previous | Change | |
|---|---|---|---|---|
| Barrels | $1.1500 | $1.1500 | 0 | Based on sale |
| Blocks | $1.2625 | $1.2100 | $.0525 | Based on bids |

$1.2150 and Trader A bid for two additional cars of blocks at $1.2150. These bids were subsequently increased to $1.2175. Trader A again increased its bid for two cars of blocks to $1.2200 at which point Trader C filled the bid resulting in a sale at $1.22.

By following the sequence of trading, it is possible to see the interplay between buyers and sellers. Two more cars of blocks were sold at $1.2400. This was followed by unfilled bids for blocks at $1.2400, $1.2425, $1.2450, $1.2475, $1.2500, $1.2525, $1.2550, $1.2575, $1.2600 and $1.2625. The unfilled bid at $1.2625, since it was higher than the last sale at $1.2400, was the market-making transaction for block cheese for the week.

It is reasonable to presume that those bidding for cheese were either short of cheese or felt the price should go higher, and that those offering cheese, or filling bids, did not feel that price increases were warranted on the basis either of their own supply-demand situation, or their perception of the overall market outlook. It is also reasonable to presume that supplies of barrel cheese were more plentiful than were supplies of blocks relative to demand.

***Significance of Exchange Trading***

Many, if not most, buyers and sellers of cheese in wholesale quantities base the price at which they buy or sell cheese on the basis of formula, or contracts using the Exchange price for 40-pound blocks, or barrels as a base price. This applies not only to cheddar cheese but to most other major varieties such as Italian or Swiss. Formulas provide for premiums or discounts to reflect various factors affecting prices, such as volume, quality, packaging, special flavor characteristics, etc.

By virtue of its widespread use, the cheese industry appears to be generally satisfied with formula pricing and the use of prices determined through Exchange trading as a pricing base. However, there are some manufacturers who use or have tried other ways of setting their contract prices. In general, if these prices deviate substantially from the Exchange price, marketing problems occur.

The price dairy plant operators receive for cheese and other manufactured dairy products has a direct and major influence on the price they can pay dairy farmers shipping milk to their plants. Since the early 1980s when cheese sales began to skyrocket and other manufactured product markets became more lackluster, cheese has become the major manufactured dairy product influencing farm milk prices. The price of milk used for manufacturing is used as a mover of class I, II, and III prices under federal milk marketing orders (cf., Leaflet O-3). These orders establish minimum prices for about 80 percent of the grade A milk produced in the United States. Thus, what happens on the Exchange influences not only the price of cheese throughout the nation but also the farm price of milk used both for fluid purposes and manufactured dairy products.

***National Cheese Exchange Issues***

Over the years, a number of issues have been identified as potential problems, or concerns with the operation of the Exchange. These are outlined as follows:

1. Price Volatility

During much of the time during the period 1950 to 1985, the dairy industry was periodically confronted with situations of surplus milk. Market prices for manufactured dairy products, including cheese, rested at or near Commodity Credit Corporation purchase prices under the price support program. Also, during much of this period, the government had large inventories of cheese, as well as butter and nonfat dry milk, which were available for resale to the trade at 105 percent and later 110 percent of the CCC purchase price. Volatility in cheese prices was not a problem under these circumstances.

Also, during periods of surplus milk with cheese prices resting at or below the CCC purchase prices, the role played by the Exchange in the dairy economy was reduced substantially. Cheese that could not be sold commercially was sold to the Commodity Credit Corporation, and trading on the Exchange virtually disappeared.

The Food Security Act of 1985 had a basic objective of returning the dairy industry to a more market-oriented situation. As a result, provisions were put in place to continue lowering the support price to the point that chronic surpluses would disappear. The combination of lower support prices, the operation of the Milk Diversion and Dairy Termination Programs, drought conditions in 1988 and 1989, and expansion of export markets for nonfat dry milk have resulted in a significant reduction in the size of the surplus since the mid-1980s. Virtually no cheese has been purchased for price support purposes in recent years and the CCC has not had cheese in inventory to sell back to the trade.

As a result, wholesale cheese prices have been well above the CCC purchase price since 1988. With market forces more dominant, cheese prices have been more volatile.

A brief review of the period since 1987 highlights the effect of reduced surpluses of cheese on price movements. During the excessive surplus years of 1982-1987, the average annual range of prices for 40-pound blocks as reflected by trading on the Exchange was less than 10 cents. During that period, price support purchases of cheese were sizeable and the CCC sold very little cheese back to the trade at 110 percent of the purchase price. With the exception of 1990, very little cheese was sold to USDA for price support purposes since 1987, and its inventory of cheese for resale to the trade has been nonexistent. Market prices have been well above the CCC purchase price most of the time, and market forces have been the primary factor moving the market up and down. During the period 1988-1993, the annual range of prices for 40-pound blocks on the Exchange averaged 27 cents, nearly three times as great as during the 1982-1987 period.

There have been significant short-term swings in the cheese market. One of the sharpest declines on record occurred in 1990 when the market declined from $1.4588 in August to $1.0875 in November. This 37-cent decline translates to about a $3.70 per hundredweight decline in farm milk prices. To date the record drop occurred in October 1990 and May 1994, when block prices fell 10.25 cents in one week This sizeable drop also generated large inventory losses for many firms in the cheese industry. At other times, cheese prices have increased rapidly, resulting in sharp inventory gains and increases in farm milk prices.

The pattern of cheese prices in 1993 was unusual and attracted considerable attention. The market increased contraseasonally from $1.16 in February to $1.39 in June during a period when milk and cheese production were increasing seasonally. From June to August, a time when cheese prices ordinarily increase seasonally, the market declined 17cents per pound of cheese. This was followed by an increase of 12.5 cents per pound in the fall.

Is volatility in prices generated by trading on the Exchange an indictment of its operation, or a validation of its operating as an efficient market? In other words, does it mean something is wrong with the Exchange or is the Exchange supply reflecting the underlying volatility of free markets? In practice, market theory and psychology might well predict the kind of volatility experienced in Exchange trading in recent years. Given the nature of dairy markets, and the cheese market in particular, small changes in supply and demand for cheese can cause significant swings in wholesale prices. As long as cheese prices remain well above the CCC purchase price, volatility in the cheese market is likely to continue.

2. "Thin Market" Concerns

The term "thin market" generally is used by economists and others to describe markets with little trading volume in which individual firms may be able to exert undue influence on prices and other terms of trade [4, p.7]. The National Cheese Exchange has at times been described as a "thin market." In 1993, there were 401 cars of barrel cheese and 195 cars of 40-pound blocks of cheddar cheese sold on the Exchange. This amounted to about 24,000,000 pounds of cheddar cheese. In addition, there were unfilled bids, or uncovered offers, on 209 cars of barrel cheese and 112 cars of 40-pound blocks, or the equivalent of an additional 12,840,000 pounds of cheese.

The volume of sales was equal to 0.9 percent of cheddar cheese production in 1992. Table 1 provides an indication of the percentage of total U.S. American cheese production sold on the Exchange during the period 1990 to 1993. It is clear from Table 1 that trading on the Exchange comprises only a fraction of total cheese production in the country. Table 1 somewhat understates the volume of trading because market prices move on bids and offers as well as sales. It is interesting to note that the volume of trading was much lower during the period 1980-1987 when the purchase price

Table 1. Volume of Sales on National Cheese Exchange Relative to Total Volume of American Cheese Produced in the United States, 1990-1993.

| Volume of sales on NCE | Cars | Pounds |
|---|---|---|
| 1990 | 342 cars | 13,080,000 |
| 1991 | 399 cars | 15,960,000 |
| 1992 | 380 cars | 15,200,000 |
| 1993 | 596 cars | 23,840,000 |
| | | |
| Volume of American cheese production in U.S. | Mil. lbs. | |
| 1990 | 2894.2 | |
| 1991 | 2768.9 | |
| 1992 | 2936.6 | |
| 1993 | 2924.8 | |

under the price support program was the main factor determining the price of cheese.

While the cheese industry is concentrated, it is significant that dairy cooperatives are a major force in the industry both with respect to production and marketing of cheese. A number of large dairy cooperatives as well as proprietary cheese and food distributors are members of the Exchange. These dairy cooperatives participate actively in Exchange trading and represent the interest of milk producers. In addition, the Exchange also includes proprietary firms that buy as well as sell, firms that have competing interests in price changes.

While the Exchange market has been described as "thin" and the industry concentrated, experience has shown that any firm attempting to buy or sell cheese at levels which differ from that of the general consensus of the industry must be prepared to buy or sell large quantities of cheese in order to raise or lower the market.

The vast proportion of cheese sold in the United States is sold on a formula, private treaty, contractual basis. Therefore, although there is a small volume sold on the Exchange, that volume comprises a significant proportion of the volume of buyer/seller negotiated trades within the cheese industry. The relevant issue is not whether the Exchange represents a small volume but whether it does reasonably reflect the supply and demand conditions in the U. S. cheese industry. If members reflect national market conditions in their transactions, then the Exchange performance is acceptable. Again the evidence seems to suggest that the Exchange prices generally reflect the economic fundamentals of the cheese markets. If they did not, serious efforts would be made to find alternative price determination mechanisms. Numerous studies and investigations of the Exchange have repeatedly failed to uncover illegal or questionable pricing or trading practices.

3. Representativeness of the NCE Trades

Only block and barrel cheddar cheese are traded on the National Cheese Exchange. Although American-type cheeses made up approximately 48 percent of the 1990 U.S. cheese output, there is significant volume and recent rapid growth in the production and consumption of Italian-type cheeses. Are the reported prices for barrel and block cheddar cheese representative of the markets for non-cheddar and non-American type products?

All evidence seems to indicate that the buyers and sellers of commodity cheese other than cheddar varieties are still comfortable using Exchange reported prices in their negotiated formula negotiations. If there is a demand for trading other kinds of cheese, nothing precludes the National Cheese Exchange from establishing bids, offers, and sales in other types of cheese products. In fact, over its history, the National Cheese Exchange has traded other cheese varieties such as Swiss, and in other packing sizes such as single daisies and longhorns. Again, the lack of diversity and product trading appears to be a result of market forces and demands that have effectuated the rules under which the Exchange engages in business. Should market conditions change to develop demand for alternative trading, there is nothing in the past history or behavior of the Cheese Exchange that suggests an unwillingness to accommodate trading opportunities.

4. Market Dominance Concerns

There are relatively few members of the National Cheese Exchange, and those members control a large proportion of cheese production and marketing in the United States. In a 1979 study, it was estimated that the members of the Cheese Exchange handled between 80 and 90 percent of all cheese marketed in the United States [3]. Given the relatively small number of members of the Exchange and the large proportion of the industry they represent, some observers suspect that the Exchange provides a forum and mechanism for market price manipulation. Such suspicions are reinforced by the fact that in 1992, 85 percent of the Exchange sales were accounted for by three firms, while another three firms accounted for 80 percent of the purchases. Analysis of these allegations in the past has always resulted in the exoneration of the Exchange.

Although accurate statistics are not available, the U.S. cheese industry is certainly a concentrated market with a few dominant cheese producers and marketers. This market structure would continue to exist in the absence of the Exchange. Furthermore, the National Cheese Exchange provides transparency and visibility to cheese market trading which would not otherwise exist. Exchange transactions and activities are reported fully and widely.

Whether prices on the Exchange can or have been manipulated may always be in question given the structure of the cheese industry. Again, the only test of any market is to measure its performance on reflecting the fundamental supply and demand conditions in cheese markets. With few exceptions, markets cannot be led

away from basic supply/demand fundamentals over a long period.

***Summary and Conclusions***

The interest and scrutiny the National Cheese Exchange has received over the years is testimony to its importance to U.S. cheese markets and the U.S. dairy industry in general. The National Cheese Exchange exists for the specific purpose of cash trading of cheese products when, for whatever reason, negotiated private trades do not meet the requirements of either buyer or seller. The U.S. food distribution system chooses to use the price observations from the Exchange to facilitate its pricing and distribution of cheese products. If the performance of the cheese marketing and distribution system suffered as the consequence of using the Exchange, new pricing mechanisms, arrangements, and/or markets would emerge over time.

Generally, the Exchange structure and operation reflects the market organization and structural conditions of the cheese markets. Cheese manufacturing and processing has increasingly come to be dominated by a few large firms. Also, because of the extensive use of formula pricing, very little cheese is traded through open cash trades. These two conditions in the cheese industry will be reflected by the markets designed to service the industry, with or without a cheese exchange.

***SELECTED REFERENCES***


[1] Gould, R. J., "The National Cheese Exchange," in Pricing Problems in the Food Industry, N.C. 117 Monograph No. 7, North Central Regional Publication 261, University of Wisconsin, Madison, WI, February 1979, pp. 79-84.

[2] Graf, T. F., "Thin Market Case Study—National Cheese Exchange," in Pricing Problems in the Food Industry, N.C. 117 Monograph No. 7, North Central Regional Publication 261, University of Wisconsin, Madison, WI, February 1979, pp. 65-78.

[3] Hayenga, M. L., "Cheese Pricing Systems," N. C. Project NC-117, Working Paper No. 38, Department of Agricultural Economics, University of Wisconsin, Madison, WI, August 1979.

[4] Hayenga, M. L., G. L. Gardner, A. B. Paul, and J. P. Houck, "The Concept of a Thin Market," in Pricing Problems in the Food Industry, N.C. 117 Monograph No. 7, North Central Regional Publication 261, University of Wisconsin, Madison, WI, February 1979, pp. 7-13.

[5] March, Robert, "The National Cheese Exchange," Dairy Market Report, Vol. 1, No. 3, 1993, National Dairy Promotion and Research Board, Arlington, VA 22201.

[6] National Cheese Exchange, Inc., "Rules Regulating Trading," Mimeograph NCE, Inc., 1658 Marrow Street, Green Bay, WI, April 6, 1990.

[7] USDA, Agricultural Market Service, Dairy Market Statistics, Various Annual Summaries, Dairy Market Division, Madison, WI.