Thus, the existence of the NCE and the industrywide practice of NCE-based formula pricing greatly enhances or facilitates the use of the power conferred by Kraft's various strategic advantages.[11] Since potential traders do not enjoy these advantages, they cannot *contest* the pricing decisions made on the NCE. This establishes the NCE as an incontestable submarket within the aggregate cheese market. And because cheese in the aggregate market is priced "off the NCE," the ability to influence NCE prices confers influence over industrywide prices.

The documentary evidence indicates that sellers with strong brands not coupled to NCE prices benefit from lower NCE prices, other things being equal. Kraft's conduct on the Exchange, as well as documentary evidence, implies that it believed it could influence NCE prices, and that at times it sold at a loss to accomplish this result. Selling on the NCE at a loss when it could have sold profitably (or at a smaller loss) elsewhere constitutes irrational business conduct unless Kraft expected to benefit from lower prices paid to committed suppliers. That is to say, rational businessmen would not needlessly squander resources in Exchange selling unless they believed doing so enhanced overall profits.

Kraft's former director of procurement rationalized Kraft's behavior on the NCE by explaining that when Kraft has a surplus it first offers cheese to potential spot buyers. When it

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[11] The NCE, as presently structured, may be viewed as an institution that enhances or *facilitates* the use of unilateral or collective market power. The legal-economic literature on facilitating practices usually discusses them in the context of practices that promote cooperation among competitors and market dominance. The critical point is that the facilitating practice enhances the use of unilateral or collective market power. See Scherer and Ross, *op cit*, 235-274; Donald S. Clark, "Price Fixing Without Collusion," 1983, *Wisconsin Law Review*, 887; Kevin J. Arquit, "The Boundaries of Horizontal Restraints: Facilitating Practices and Invitations to Collude," Federal Trade Commission, Washington, D.C., August 11, 1992; Randall C. Marks, "Can Conspiracy Theory Solve the Oligopoly Problem?" 1986, *Maryland Law Review*, 387.

exhausts this demand, it sells the remainder on the NCE at a loss, if necessary. He acknowledged that in this scenario the NCE might be viewed as a *market of last resort.* If correct, this would be a serious indictment of the thin NCE market as an appropriate basis for formula pricing practically all sales of bulk cheese.

Kraft's use of the NCE as a market of last resort is also irrational conduct for a seller seeking to maximize profits on surplus sales. Economic theory teaches and business experience verifies that sellers in imperfectly competitive markets avoid publicizing prices of distress sales to avoid "spoiling" the market for other sales. This logic implies that a rational seller would make distress sales in the spot market, not the NCE where prices become public immediately. It is rational, however, to treat the NCE as a *market of last resort* if doing so reduces the price at which a *seller* on the Exchange *buys* large amounts of bulk cheese off the Exchange at NCE-based formula prices.

Finally, our econometric analysis provides further support for the hypothesis that during 1988-1993 Kraft and other seller-traders had a significant negative impact on NCE prices. The implication is that at times Kraft enjoyed significant savings in procuring bulk cheese because it bought the cheese at NCE-based formula prices. The econometric analysis found that leading buyer-traders had no statistically significant impact on prices. But based on our non-econometric analysis of buyer-trader motives and conduct, we are inclined to believe they did have a modest countervailing influence. At a minimum, had they made no effort to countervail Kraft's leadership, NCE prices might have been lower at times. Thus, we do not imply that there are no constraints on Kraft's influence, but rather that during 1988-1993 the balance of power tilted in Kraft's favor and that at times it benefitted from this advantage.

Farmers have an important financial interest in higher NCE prices, but their cooperatives cannot be indifferent to the effect higher prices may have on milk output. In the absence of control over the supply of milk for manufacturing and without government support programs, the highest price cooperatives may achieve is the competitive equilibrium price. They do, of course, have a strong incentive to prevent NCE prices from going below this price, which may occur if NCE prices are manipulated.

In sum, our analysis of business motives, trading conduct on the NCE, an in-depth analysis of Kraft's conduct on and off the NCE, and a quantitative analysis of NCE prices indicate that the National Cheese Exchange was not an effectively competitive price discovery mechanism during 1988-1993. As currently organized, the Exchange appears to facilitate market manipulation. The main beneficiaries of this situation appear to be Kraft General Foods, Inc. and other seller-traders with coincident interests. The evidence supports the hypothesis that during 1988-1993 Kraft (a) had a financial *motive* for influencing NCE prices, (b) had the *power* to influence prices, and (c) had at times exercised this power for its benefit. We emphasize, however, that we found no evidence of collusion among cheese companies.

This raises the question, did Kraft posses *unilateral* power over prices in NCE trading? To posses unilateral power a firm must hold a substantial market share in an economic market with significant entry barriers that protect the firm from potential competitors.

Kraft's average share of NCE sales during 1988-1993 was 74 percent, which is well above the range that economists generally consider sufficient to confer unilateral power in a market with high entry barriers.[12]

NCE trading constitutes a separate economic market shielded by substantial entry barriers. These barriers exist because practically all bulk cheese prices in the aggregate cheese market are priced off NCE prices and because actual and potential traders in the aggregate market cannot replicate, at the same cost, the strategic competitive advantages Kraft enjoys in NCE trading. Therefore, both the actual and potential traders on the NCE apparently cannot successfully *contest* the prices established there even when they depart significantly from competitive levels.[13]

Thus, during 1988-1993 Kraft enjoyed the two necessary conditions of unilateral power, a large market share in a market with significant entry barriers.

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[12] Economists typically assume firms with market shares exceeding 40-50 percent may possess unilateral market power. George J. Stigler, *The Organization of Industry*, 1968, 228, uses 40 percent in identifying such firms. P.A. Geroski, "Do Dominant Firms Decline," in Donald Hand and John Vichers (eds.), *The Economics of Market Dominance*, 1987, states that "A market share of 40 percent is the conventionally accepted cut-off point" in identifying dominance.

During 1988-1993 Kraft's annual share of NCE sales ranged from 56 percent to 91 percent. Kraft's share apparently varied, in part, depending upon the volume of sales required to achieve its objectives. Each year it very probably could have sold larger amounts on the NCE had this been required to achieve its objectives.

[13] The theory of contestable markets holds that a firm with a large market share has power over price if entry and exit in a market are made difficult because of significant advantages enjoyed by the dominant incumbent firms. John C. Panzar and Robert D. Willig, *Contestable Markets and the Theory of Industry Structure*, 1982. Also, see text at notes 30-31, Chapter 3, for reasons NCE prices may not be representative of aggregate demand and supply conditions.

Because these conclusions are based on an analysis of the six-year period, 1988-1993, they may reflect factors *unique* to these years, and therefore may be an imperfect predictor of the future performance of NCE pricing. There is evidence that beginning in 1990 Kraft engaged in especially aggressive short-run profit maximization, as it increased substantially gross profits for cheese by widening the spread between wholesale net selling prices and bulk cheese procurement costs. During this period Kraft appears to have used the competitive advantages it enjoys in NCE trading to periodically depress bulk cheese prices, perhaps by a greater amount than is sustainable in the future. If so, this does not diminish the apparent consequences of Kraft's conduct during the years studied nor gainsay the need to enhance the NCE's competitive performance. Even short-run price manipulation subverts the market to the detriment of consumers and farmers as well as some industry participants.

K. Public and Private Initiatives to Improve Price Discovery

There are several possible solutions to the problems with price discovery on the NCE. Included in the following discussion are policies and procedures which could be implemented in conjunction with the NCE as well as suggestions for possible alternatives to the Exchange as a central cash auction market.

In considering alternatives to the Exchange, we are mindful that despite its deficiencies as a price discovery mechanism, the Exchange is widely used by industry participants as a reference price in formula pricing. This function is highly prized by many because it greatly reduces transaction costs. It is therefore imperative that any alternative to the Exchange continue to provide this function.

The Problem of Trading Against Interest

As discussed earlier an anomalous trading pattern has emerged on the NCE in which the leading *sellers* on the NCE are predominantly *buyers* of bulk cheese off the NCE; the leading *buyers* on the NCE are either large agricultural cooperative cheese manufacturers that *sell* bulk cheese off the NCE or large cheese marketers that sell private label brands or weak company brands. This trading pattern appears to be motivated by efforts to influence prices, not to use the Exchange as a residual market.

This behavior may involve what legal-economic analysts characterize as "trading against interest," a phenomenon in which big buyers (sellers) of a product may sell (buy) some of it in one market in a way that depresses (increases) the price in another market where the companies buy (sell) practically all their supplies. Such conduct always raises a question of potential market manipulation.

While both leading buyers and sellers on the NCE may have periodically attempted to trade against interest in recent years, leading seller-traders, dominated by Kraft, appear to have been the main beneficiaries of the practice. Indeed, the conduct of leading buyer-traders during 1988-1993 may have been largely a response to Kraft's seller-trader activity beginning in August 1986. The apparent purpose and effect of Kraft's conduct on the NCE have certain parallels to a classic market price manipulation case involving trading against interest. In *Socony*,the major oil companies used the spot market price of gasoline to formula-price gasoline they sold to jobbers. By purchasing a small amount of gasoline in the spot market, the major oil

companies were able to raise spot prices, thereby raising prices to jobbers and consumers throughout the Midwest.[14] The Supreme Court concluded in part:

> [T]he fact that sales on the spot markets were still governed by some competition is of no consequence. For it is indisputable that competition was restricted through the removal by respondents of a part of the supply which but for the buying programs would have been a factor in determining the going prices on those markets.[15]

Whereas the oil companies manipulated the spot market in order to benefit their selling prices, Kraft sold on the NCE with the apparent purpose and effect of lowering the price it paid for cheese purchased from committed suppliers under NCE-based formula prices..

Unlike the major oil companies, who achieved their purpose by *agreement* among oligopolists, Kraft's conduct seems to involve primarily a *unilateral* action, followed by some cooperating marketers with interests similar to Kraft's. *Unilateral* conduct involving selling against interest also *may* violate public policy when practiced by a dominant trader. For example, in a consent decree the National Cranberry Association, the dominant cranberry marketer, is among other things restrained from, "Purchasing cranberries from others and reselling or otherwise disposing of them to artificially raise, depress or stabilize market price levels of fresh or processed cranberries."[16]

Various public and private initiatives may aid in eliminating the market failure problems caused by trading against interest. To be effective, the policies must address the factors that make such trading possible and that give competitive advantage to some traders. Below we discuss possible approaches to the problem.

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[14] *United States v. Socony*, 310 U.S. 150 (1940).

[15] *Ibid.*

[16] *United States v. Nat. Cranberry Ass'n*, 1957 TC par. 68, 850 (D. Mass 1957).

Prohibiting Trading Against Interest

The courts have approved decrees banning trading against interest where the purpose and effect have been to manipulate prices.[17] We do not presume here to determine whether the apparent trading against interest on the NCE meets the standards of legal proof required for a finding of price manipulation under the Federal or Wisconsin antitrust and unfair competition statutes.

The NCE By-Laws have been applied to prohibit trading against interest, although they have been applied only narrowly. In one instance a trader who covered an outstanding offer at a higher price than the last covered offer was reprimanded by the Directors of the Exchange because the trade "was not consistent with the *natural self interest* of buyers to attempt to purchase at the existing or a lower market price."[18] Yet, Exchange president Richard Gould and

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17 For example, *Socony* and *National Cranberry Assn.*

18 Minutes for a Special Meeting of the Board of Directors of National Cheese Exchange held on August 31, 1990, 3. Emphasis added. Exchange President Gould wrote this trader that "your company's *trading activity was clearly against its economic best interests* and could easily be interpreted as an intentional attempt to manipulate the market price of 40 pound block." Emphasis added. R.J. Gould to Robert Burns, President, Beatrice Foods, September 21, 1990. For a discussion of this and a similar incident see text at notes 108-111, Chapter 4. The Board viewed this conduct as "detrimental to the interests and welfare of the Exchange." Minutes of a Special Meeting of the Board of Directors of the National Cheese Exchange, August 31, 1990, p. 4. The Board's authority for prohibiting such conduct is Article III Section 4(a) of the NCE By-Laws, which authorizes the Board to suspend a member for "any conduct considered detrimental to the interests or welfare of the Corporation. Suspension in each case shall be for such period of time as may be designated by the Board of Directors not exceeding six months." National Cheese Exchange By-Laws, Article III, Section 4(a), which was amended August 23, 1988, "increasing permissible suspension from two months to six months."

The Exchange president has responsibility for monitoring trading activity for collusion. "Interview of Richard J. Gould," Rosemary Derrio to Matt Frank, Assistant Attorney General of the Wisconsin Department of Justice, March 4, 1988, p. 3.

the NCE Board of Directors have expressed the view that the NCE cannot be manipulated by the "unilateral" action of an individual trader.[19]

Trading Limits

A cash auction market may adopt rules limiting the amount of purchases or sales made by a single party. For example, the United States Treasury Department has such a rule in the sale of United States securities: "The maximum award that will be made to any bidder is 35 percent of the public offering...."[20] This rule was deemed necessary despite the fact that there are about 35 "primary" treasury security dealers as well as other bidders for a particular security being sold. Moreover, the new security competes with similar securities already available in the market; for example, a new two-year treasury security has competition from already issued securities of similar duration.

This approach may not be practical on the NCE. It clearly could not be applied to trading for individual days. Nor may it be practical if applied to longer periods, since a trader would never know beforehand how much total trading would occur over the relevant period.

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19 See Chapter 4, note 100 and text at note 103.

20 *Sale and Issue of Marketable Book-Entry Treasury Bills, Notes, and Bonds*, Department of the Treasury Circular, Public Debt Series No. 1-93, Section 35622.

May 20, 1992, Saloman, Inc. and Salomon Brothers, Inc., entered into a consent settlement agreement with the Securities and Exchange Commission for allegedly violating the Treasury Department 35 percent rule. Among other matters agreed to in the settlement, Saloman was required to pay $190 million to the United States and $100 million for compensatory damages to injured parties. *Securities and Exchange Commission v. Saloman Inc. And Saloman Brothers Inc.*, Complaint and Permanent Injunction and other Relief, May 20, 1992.

Alternative Basis for Formula Pricing Cheese

One alternative for preventing any trader from affecting price by trading against interest is to change the rules of the NCE, or enforce more aggressively the existing rules. Another alternative is to develop some price basis other than the NCE that can be used for formula pricing bulk cheese. From time to time, some members have advocated alternatives. Indeed, apparently some Kraft officials are not wedded to the NCE and have said that Kraft supports the review of alternatives to the NCE, and expects to participate in any alternative.[21] In our view, however, the required industry participation and assistance which would be required to make any fundamental changes may not be forthcoming until some State or Federal authority determines whether trading against interest has occurred and has adversely influenced prices on the Exchange.

In considering alternative bases for formula pricing, it is important to keep in mind that existing problems with the NCE are due to a combination of factors: the Exchange is a *highly concentrated, thin market*, that is highly leveraged in its effect through *formula pricing;* and Kraft enjoys a *strategic competitive advantage* over other actual and potential traders on the Exchange. So long as these conditions exist, the NCE serves to *facilitate* non-competitive

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[21] Kraft General Foods, Inc., *Milk Prices, Cheese Prices and the National Cheese Exchange*, author not identified, April 14, 1992, KGF 16948, 16956. A cover page to the document indicates it was forwarded from Wayne Hangartner, Kraft's Director of Cheese Procurement and Inventories, to others in his department, and is identified as "Copy of Presentation to the Dairy Farm Specialists" on 4/14/92. A similar sentiment is expressed in Kraft General Foods, Inc., *National Cheese Exchange (NCE)*, author not identified and undated, KGF 16913, 16917.

On another occasion Phillip Morris Vice President and Secretary stated that Kraft supports "the review of alternatives [to the NCE] and expects to participate in any alternative that may be developed." Dede Thompson Bartlett, *op. cit.*, p. 2. See note 10 above, this chapter.

behavior. Any alternative basis for formula pricing, to be an improvement, must eliminate or reduce the distorting influence of these problems.

Trading on the NCE is much more concentrated than is cheese manufacturing, cheese converting or cheese marketing. If the industry were to adopt a different price discovery mechanism that encouraged/allowed participation of more members representative of the aggregate market, a more competitive market would evolve. Such a market might be much less concentrated and might reduce the strategic competitive advantages Kraft enjoys in NCE trading, especially if the other initiatives discussed below were adopted.

Price Report for Direct Spot Transactions

Price reports of decentralized spot transactions are used in several commodities as a reference price for formula pricing (see Appendix 7.A, which reviews thin market/formula pricing problems in other agricultural commodities). This system is clearly feasible in the case of cheese. At the present time, Wisconsin Assembly Point prices are reported weekly. However, the accuracy of these reports is not highly regarded by industry members. To replace the NCE as a basis for formula pricing, the spot market price report would need to be substantially improved.[22]

Such a price report could still encounter thin market problems since the spot market for bulk cheese represents only 5 to 10 percent of total cheese volume, and during tight supply conditions perhaps much less than that. We have not been able to determine the size of the spot market for cheddar cheese which meets NCE standards. We do know, however, that it is

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[22] One cheese company has used the WAP price in setting the premiums paid one of its suppliers in Wisconsin.

significantly larger than the current volume sold on the NCE. Even the largest traders typically trade much more off the NCE than on it, and numerous cheese companies never trade on the Exchange. A report covering spot sales nationally would enlarge the total volume of direct transactions, greatly expand the reporting base and better reflect aggregate market conditions. (The current WAP price report covers only sales in Wisconsin.) Such an enlarged spot price reporting program would better reflect the overall structure of cheese manufacturing and cheese marketing, which is relatively unconcentrated and therefore less subject to manipulation. Thus, we believe that thin market problems would be fewer and less influential than those of the NCE.

In order to avoid a thin price reporting problem like those encountered in beef (see Appendix 7.A), it would be essential that the spot market price report be accurate and based on a significant portion of spot transactions. Thus, a mandatory reporting program similar to those used for some products in California may be required.[23]

While price reports of spot transactions of bulk cheese appear feasible at the present time, it is well to keep in mind that there are other ways of developing an acceptable reference price. Another alternative is for market news to "simulate or formulate prices for thin markets based upon prices of related products that are traded in less thin or more price-representative markets."[24] For example, live broiler prices can be formulated from ready-to-eat broiler prices. And, carcass beef prices can be formulated from boxed beef prices. Thus, if the spot market for bulk cheese should also become too thin over time for reliable price discovery, there may be other ways of developing an acceptable reference price.

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[23] See text at note 31 this chapter.

[24] D.R. Henderson, "Price Reporting in Thin Markets," in Hayenga, p. 120.

Electronic Marketing Systems

Spot market trading might be facilitated by the adoption of an electronic market system. Electronic markets have been tried with mixed success in several agricultural commodities. Although several of the markets did not succeed, experience has shown that such markets generally reduced marketing costs, increased prices to sellers and lowered costs to buyers, improved pricing efficiency and increased competition.[25] The problems of adapting to an electronic market in cheese may be less difficult than in most other products where such markets are used or have been tried.

An electronic market system might increase spot trading in several ways. It could aid spot traders in identifying the nearest potential suppliers or buyers. Trading volume could also be increased if the electronic market permitted trading in cheeses not meeting the current NCE age and quality requirements; in addition, the frequency of trading could be increased to daily or three times a week.

To succeed, an electronic system must be cost effective. In the 1980s several electronic markets closed because of high fixed costs and low trading volume; however,enormous strides have been made in computer and communication technologies since then. With current technology, an electronic market for cheese might be less costly than the NCE, when all costs are considered. The market could be supported by all industry participants as is done in some California market reporting programs.

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[25] Wayne D. Purcell and T. L. Sporleder, "Will Electronic Markets Continue to Develop?" *National Conference on Electronic Marketing of Livestock*, Chicago, October 4, 1990.

Higher prices to commodity sellers in electronic markets appear to stem in part from increased competition between buyers and in part from reduced transaction costs. Studies of computerized auctions of slaughter lambs, [26] feeder cattle,[27] and hogs[28] found they increased prices to producers.

Part of the benefit of electronic trading is its anonymity, according to empirical analyses of these markets.[29] In oligopolistic markets, traders are more likely to compete on price if their rivals do not know the parties involved and terms of each transaction. This is in sharp contrast to NCE conditions where each trader's action is immediately known to others. In markets of few sellers, such transparency of trading tends to *facilitate* market manipulation, not competition.

An efficient electronic spot market would not, alone, solve problems arising from persistent and systematic "trading against interest" by a firm with competitive strategic advantages over other actual and potential traders. But this practice would be more difficult if much of the current spot trading were shifted to an electronic market and if other steps were taken to reduce the competitive advantage of some traders, e.g., eliminating advantages deriving from the asymmetrical market knowledge of traders.

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[26] James R. Russell and Wayne D. Purcell, "Costs of Operating a Computerized Trading System for Slaughter Lambs," *SJAE*, Vol. 15, No. 1, July 1983, pp. 123-127.

[27] Thomas L. Sporleder and Phil L. Colling, "Competition and Price Relationships for an Electronic Market," selected paper, 1986 annual meetings of the AAEA, Reno, Nevada, July 27-30, 1986.

[28] W. Timothy Rhodus, E. Dean Baldwin, and Dennis R. Henderson, "Pricing Accuracy and Efficiency in a Pilot Electronic Hog Market," *AJAE*, 71:4, November 1989, pp. 874-882.

[29] Shannon R. Hamm, Wayne D. Purcell, and Michael A. Hudson, "A Framework for Analyzing the Impact of Anonymous Bidding on Prices and Price Competition in Computerized Auction," *NCJAE*, 7:2, July 1985, pp. 109-117.

The above are merely suggested options in creating an electronic market system that may facilitate and enlarge spot trading. Industry users and others experienced in electronic markets can best determine the adjustments necessary for success in cheese.

Public and Private Actions to Improve Market Information

Accurate market information is an essential prerequisite of competitive markets. Asymmetry in market knowledge is one problem among traders on the NCE. Public information can be improved, however, particularly regarding inventory levels and prices off the NCE.

Many industry personnel interviewed in the course of this study expressed dissatisfaction with current information on commercial inventories, since they regard inventory information as critical in making price decisions. Although government data reflect trends, they do not accurately measure total inventory. Likewise, industry participants question the accuracy and usefulness of Wisconsin Assembly Point prices. This source of spot price information would be improved if it covered spot transactions in all major cheese manufacturing areas.

The Agricultural Marketing Service (AMS), USDA, should be encouraged to improve the quality of estimates and be provided the resources necessary to accomplish this. All the AMS dairy market news information programs rely on voluntary responses. We believe that it may be necessary to initiate mandatory reporting programs to obtain accurate information of inventories and prices. Such programs have been adopted for some commodities by the State of California and others.[30] For example, California's market reporting program in grapes is mandatory, its costs paid by grape processors and growers.[31] Similarly, the California State

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[30] See Henderson *op. cit.*, p. 122, regarding the legislative authority given the Secretary of Agriculture to mandate information on private trades for cotton.

[31] State of California, 1992 Food and Agricultural Code, Article 8, section 55601.6.

Market News Service has a mandatory program for reporting the price of nonfat dry milk. To insure accuracy, the records of NFDM plants are audited every two months. It is generally acknowledged that the NFDM prices reported for California are much more reliable than those reported for other regions of the country, which are based on weekly phone calls to a relatively few plants by Market News personnel.

Agricultural cooperatives also provide a promising vehicle for obtaining more accurate market information for their members. For example, in 1992, agricultural cooperatives in California and Washington established the Western Cooperative Milk Marketing Association, a marketing agency in common as permitted by the Capper-Volstead Act. This association reports to its members in aggregate form (separately for spot and contract sales) the weekly production, inventory and average prices of nonfat-dry milk and butter. Since these cooperatives represent about two-thirds of NFDM output in the country, this market information is extremely important. The association also sets a minimum price at which members agree to sell their butter and cheese.

A 1992 survey of Upper Midwest Cooperatives indicated that they believed information-sharing on cheddar and mozzarella cheese would have potential for improving their marketing efforts.[32] No action has been taken to date.

Cooperative information-exchange efforts have the potential to improve the efficiency of cheese pricing. As noted in our study, the current asymmetry in market information among traders appears to be one source of Kraft's competitive advantage on the NCE. We recommend

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[32] Robert Cropp, *The Feasibility of Joint Activities Among Dairy Cooperatives in the Processing and Marketing of Cheese*, University of Wisconsin Center for Cooperatives, UW-Madison, University of Wisconsin Extension-Cooperative Extension,

that cooperative information-exchange efforts have open membership to qualified cooperatives. Such a system creates the greatest likelihood that such efforts will improve competitive performance in a market.

Futures Trading in Cheese

A futures contract for cheddar cheese was initiated in June 1993. An analysis by Fortenbery and Zapata examined the trading volume of the contract and the degree to which futures prices and NCE prices are interdependent.[33] Co-integration analysis, the technique used by Fortenbery and Zapata, measures the extent to which two markets have achieved a long-run equilibrium. They ask "Have the cash and futures markets for cheddar cheese achieved the long-run equilibrium expected to exist between two markets pricing the same commodity and utilizing the same market information?"

Most studies of cash-futures relationships in agricultural markets have found that the two markets are closely related, with futures often leading cash markets in price discovery. In the case of cheddar cheese, Fortenbery and Zapata find no evidence that the futures market leads the cash market in price discovery, or vice versa. The two markets for cheddar cheese show substantial independence. And, for the two year period, June 1993-July 1995, the authors find that the cash (NCE) and futures markets for cheese still show no evidence of becoming co-integrated. Fortenbery and Zapata find these results unusual and raise the question of "whether

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[33] T. Randall Fortenbery and Hector O. Zapata, "An Evaluation of Price Linkages Between Futures and Cash Markets for Cheddar Cheese," Working Paper 107, Food System Research Group, University of Wisconsin-Madison, March 1995. The authors have updated this analysis through July 1995.

there are institutional or market structure constraints which prohibit the cash and futures markets from behaving in an efficient pricing manner."

There is no indication as yet that the near-term futures contract price will be used instead of the NCE in formula pricing. Indeed, this could hardly be expected since the futures contract is still struggling to survive. Before the cheese futures contract will be considered as an alternative to the NCE for formula pricing, it must become a viable futures market. The dominant role played by the NCE may actually have hindered the early success of futures trading in cheese, as some traders felt "like observers of the few large players who have dictated recent price movement."[34] Also, the NCE is too thin a market to be used by futures traders that accept delivery on a contract. For example, when Pizza Hut accepted delivery of a futures contract, it offered three loads of blocks on the NCE. By the end of the trading session, Pizza Hut had reduced its offer 18 times without a sale. Block prices dropped 10.5 cents for the day.

If a viable futures market develops for cheese, it would provide opportunities to hedge risks of market participants, including farmers. It may also improve the price discovery process by increasing the number of market participants. But a futures market, alone, will not solve all market failure problems, particularly those which are structurally based. One need only recall that a thriving gasoline futures market has existed throughout the years since the creation of the OPEC oil cartel in 1973. Similarly, coffee and some other agricultural commodity futures

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[34] CSCE Daily Dairy Market Report, September 9, 1993, Market commentary. This source reported, in part:

> Traders await with trepidation tomorrow's session at the NCE, as the last few weeks have produced large price increases...which resulted in major moves in the futures markets....the reality is that the NCE continues its hold on market participants. At least for the time being, this causes some traders to feel like observers of the few large players who have dictated recent price movement.

markets have operated successfully in industries with state-run cartels. While such futures markets are useful in hedging risks, they have not brought effective competition to these industries. We emphasize this point lest some mistakenly conclude that all competitive problems in the cheese industry will be solved by a viable futures market.

Appendix 7.A
Thin Market/Formula Pricing Problems in Other Agricultural Commodities

Thin markets and formula pricing are not uncommon problems in agricultural commodities. A conference sponsored by regional research project NC 117 and the University of Wisconsin in 1978 focused specifically on pricing problems in thin markets (Hayenga 1979). The potential solution to these problems depends on the underlying structure of the markets involved and the cause of the perceived thin trading problem.

A few examples may illustrate the point. In the late 1970s, the National Provisioner "Yellow Sheet" received considerable scrutiny as the dominant reference price for wholesale beef carcasses and primals. Investigations revealed that the Yellow Sheet prices were often based on 1 or 2 transactions; in some cases, market prices were estimated with no actual trades. The problem here was thin price reporting; negotiated transactions were estimated to account for about 30 percent of the beef volume. The Yellow Sheet was reporting on a tiny portion of this volume. Because of this, firms allegedly could manipulate the Yellow Sheet prices. Had a much larger sample of the negotiated transactions been used by the Yellow Sheet, the allegations of manipulated and unrepresentative prices might have been avoided. The Yellow Sheet also failed to keep pace with product changes in the industry. Boxed beef rapidly replaced carcasses as the dominant product form in the 1970s and 1980s. The Yellow Sheet was slow in adapting.

The solution in this case was for the industry to shift to an alternative reference price--the USDA Wholesale Meat Price Report. Called the "Blue Sheet," the USDA price report was expanded in the late 1970s and early 1980s in response to industry requests. Boxed beef composite values have been emphasized with daily quotes currently provided on 2 grades and 2 weights. A carcass cut-out value is also reported to provide feeders a way of converting boxed

beef prices to the value of their cattle. By the mid 1980s, the Blue Sheet had become the dominant reference price used by the beef industry. Formula pricing using the Blue Sheet is estimated to be used on about 80% of the wholesale beef sold in the U.S; negotiated trades account for roughly 20 percent.

Beef is similar to many agricultural commodities in the sense that a growing proportion of transactions are not standardized. Rather, transactions are increasingly specialized as to weight, trim, grade and cut. However, the industry still has a strong desire to use a formula price. And to formula price, an acceptable reference price is needed. The price of a standardized product is most useful for formula pricing purposes. The dilemma facing many commodities is that the trend toward specialized transactions is eroding the base for a standardized reference price. In the case of beef, the USDA has computed carcass values based upon boxed beef and wholesale cut prices.

Egg pricing has also been plagued by a thin market-formula pricing combination. Most transfer prices for eggs in the eastern two-thirds of the U.S. are based on the Urner Barry quotation for New York eggs. Urner Barry (UB) has published price quotations for eggs for over 100 years. For many years, the quote reflected the value of eggs at wholesale in New York City. Over time, it was redefined to reflect the price of cartoned eggs delivered to chain store warehouses in the New York area. The UB quote has tended to creep up so that today, it is 10 to 12 cents above the wholesale price to food retailers. The UB quote is not a report of actual transactions. The UB staff monitors going prices, the inventory situation, relative strength of demand, and availability of eggs. Based upon this information, they adjust their quote up or

down. Although there has been periodic criticism of the UB quote, it has been widely enough accepted by the industry as a third party objective indicator of value to continue in existence.

Schrader (1979) characterized the pricing problem in eggs as follows:

> The fundamental problem of pricing eggs is the almost universal desire to have a base or reference price combined with an even greater desire by firms not to participate in the open market....This leads to the tight circle of quoting prices which are based on the prior quote....[35]

Several other price discovery mechanisms have been tried for eggs (e.g., Egg Clearinghouse, Egg Market Evaluation Committee). However, none have displaced the UB quote as the dominant base for formula pricing. Because Urner Barry is an independent third party that is not reporting the prices of actual transactions, it is probably not as vulnerable to manipulation as the Yellow Sheet was. One of the things this example suggests is that spot market prices are not the only acceptable basis for formula pricing.

In studying the thin market-formula pricing problems of several agricultural commodities, several recommended solutions have been put forth. They include:

1. Prohibit formula priced transactions in a commodity. This not only "fattens" the negotiated part of the market, but eliminates the incentives to manipulate the reference price.
2. Subsidize (or reduce the cost of) negotiated spot transactions in order to encourage increased volume. Negotiated trades may be centralized as with the NCE, or decentralized via direct trades.

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[35] Lee Schrader, "Pricing Problems in the Food Industry: Broiler Chickens and Eggs," in Hayenga (ed.) *op. cit.*, p. 43.

3. "Committee" pricing, or pricing by an objective third party (e.g., similar to Urner Barry in eggs).

4. Develop an electronic exchange system utilizing computers, teletypes or other advanced technology. Centralized pricing occurs without traders being physically centralized. Trading is usually anonymous.

5. Establish trading in a futures contract for a commodity. If suppliers and demanders of the cash commodity participate actively in the futures market to forward price or hedge cash positions, the futures market can become a broader and more reliable indicator of aggregate supply and demand conditions.

6. Develop improved private or public market information, including such things as quantity manufactured and sold, size of inventories and the prices of contract and spot transactions.

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