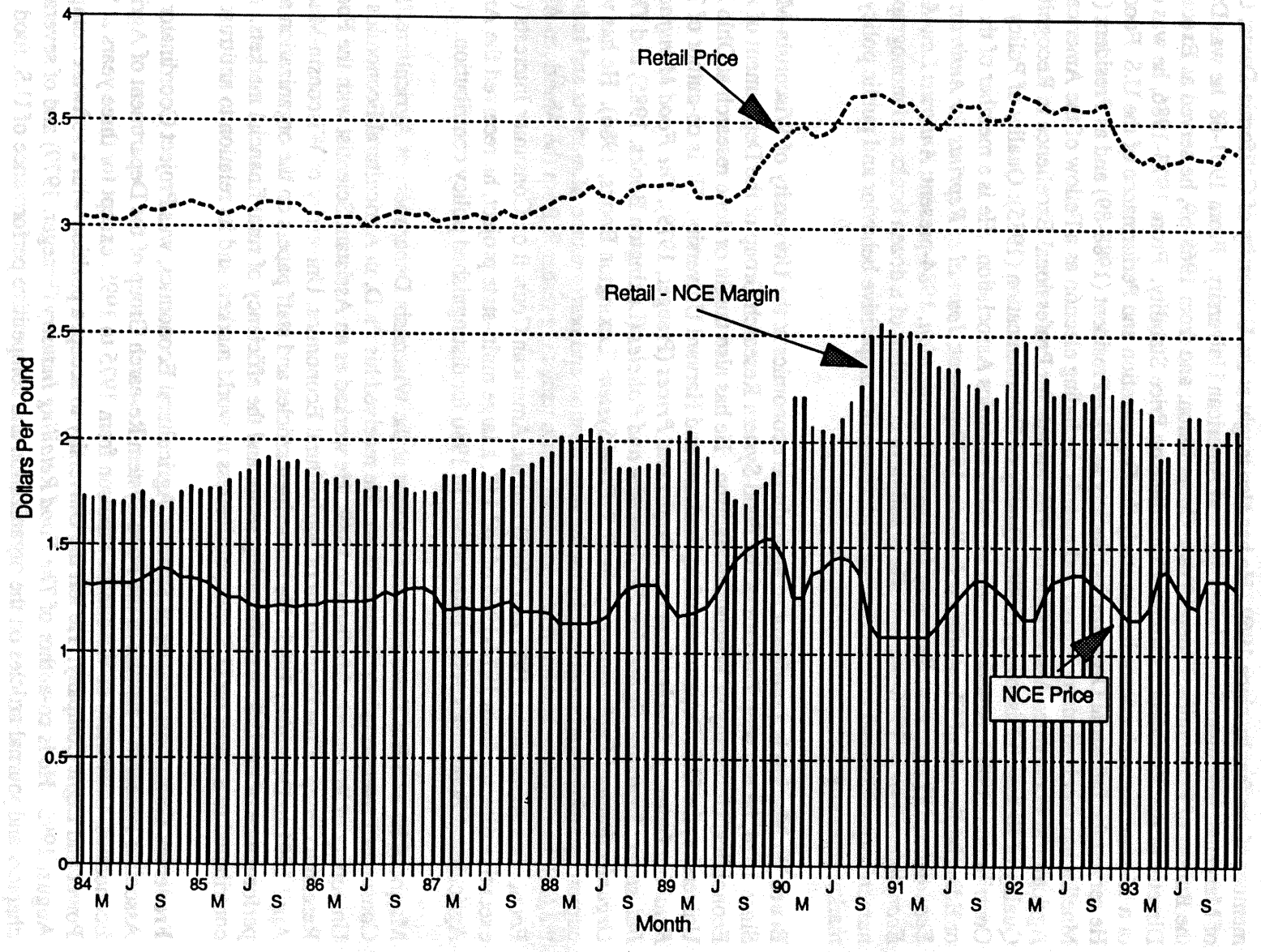
Exhibit 9. U. S. Retail Price of Natural Cheddar Cheese, NCE Block Price and Retail Price-NCE Price Margin, Monthly, 1984-1993



Sources: CPI Detailed Report, Bureau of Labor Statistics, U.S. Department of Commerce; and Dairy Market News, USDA.

About the Authors

Willard F. Mueller is Vilas Research Professor of Agricultural Economics, Professor of Economics, Professor in Law School, emeritus, at the University of Wisconsin-Madison, where he has been a member of the faculty since 1969. He has also taught at the University of California-Davis; University of Maryland; Michigan State University; and American University. From 1961-68, he was Director of the Bureau of Economics, Federal Trade Commission; and from 1968-69, he served as Executive Director of the President's Cabinet Committee on Price Stability. From 1973-1986, he was chairman of a 15-state research consortium to study the Organization and Performance of the U.S. Food System. He served the Industrial Organization Society as Vice-President (1988-89) and as President (1989-90). Mueller has received many honors and awards, including election as a Fellow of the American Agricultural Economics Association in 1976; awards for Professional Excellence in Recognition of: Quality of Research Discovery (1988); Quality of Communication (1985); Quality of Policy Contribution (1980), American Agricultural Economics Association. He is a member of the Advisory or Editorial Boards of *The Antitrust Bulletin*, 1979-present; *Journal of Reprints for Antitrust Law and Economics*, 1979-present; *Review of Industrial Organization*, 1984-present; *Antitrust Law & Economics Review*, 1986-present. He is author or co-author of a dozen books and monographs and numerous professional articles dealing with issues of competitive behavior and public policy in a market economy.

Bruce W. Marion is a professor of agricultural economics at the University of Wisconsin-Madison. Since 1974, he has been Director of the Food System Research Group of the Department of Agricultural Economics, University of Wisconsin-Madison. He has also taught or done research at Ohio State University, the U.S. Department of Agriculture, and Harvard University. He is co-author of *The Food Retailing Industry: Market Structure, Profits and Prices* (Praeger, 1979), *The Food Manufacturing Industries: Structure, Strategies, Performance and Policies* (Lexington Books, 1985) and *The Organization and Performance of the U.S. Food System* (Lexington Books, 1986). He has written numerous articles and monographs on the organization and performance of markets and industries in the U.S. food system and has received awards for outstanding research from the American Agricultural Economics Association (1977 and 1985) and the American Council on Consumer Interests (1970). As executive director from 1974-1986 of NC 117, a large multi-state project, he received the American Agricultural Economics Association award in 1980 for distinguished policy contribution.

Maqbool H. Sial is a Trade Practices Analyst at the Wisconsin Department of Agriculture, Trade and Consumer Protection since January 1996. He received his Ph.D. in Agricultural Economics from the University of Wisconsin-Madison in 1989. He worked as an Assistant Scientist with the Food System Research Group of the Department of Agricultural Economics, University of Wisconsin-Madison, from April 1991 to December 1995. He has written articles and staff papers on the organization and performance of the U.S. manufacturing sector and the efficiency of rural financial markets. He has also contributed to a paper on U.S. competitiveness in world markets and its relation to antitrust policies.

Frederick Geithman, Master of Science, Agricultural Economics, was Project Coordinator or Associate Research Scientist in the Food System Research Group of the Department of Agricultural Economics, University of Wisconsin-Madison from 1975 to 1995, except for three years at Wisconsin Power and Light Company. He left the University to accept a position with a software company in August 1995. He is co-author of *The Food Retailing Industry* (Praeger, 1979) and of several book chapters and journal articles on the organization and competitive performance of U.S. food manufacturing and retailing industries.

Cheese Pricing:
A Study of the National Cheese Exchange

A Report of the Food System Research Group,
Department of Agricultural Economics,
University of Wisconsin-Madison

prepared for

the Wisconsin Department of
Agriculture, Trade, and Consumer Protection
Investigation into Cheese Pricing

by

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March 1996

Contents

Chapter 5 Trader Activity-Price Relationships

Chapter 6 Kraft Trading Activity During 1990-1992

Chapter 7 Summary, Conclusions, and Policy Initiatives

List of Figures

List of Tables

Chapter 1--Introduction

Since the early years of this century, the National Cheese Exchange (NCE) or one of its predecessor markets has been looked to as the best indicator of the value of cheese in the U.S. This is so even though by any definition, the Exchange is a very thin market and a market with few buyers and sellers. The importance of the prices discovered on the NCE is magnified greatly because they are the basis for formula pricing 90 to 95 percent of the bulk cheese in the U.S. It is perhaps not surprising that a price discovered by so few but used by so many should be a frequent target of criticism and questions.

In early 1992, the University of Wisconsin-Madison and the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) agreed to collaborate in an analysis of cheese pricing and the National Cheese Exchange. This report is the result of that collaborative effort. The study sought to ascertain whether the NCE was an efficient market, that is, one that discovers prices for cheese that accurately reflect national supply and demand conditions. And if this were not the case, whether there exist possible unfair trade practices or methods of competition in the pricing of cheese.

To achieve this objective, the study examined the organization of the cheese industry, the characteristics of those companies actively involved in cheese manufacturing, cheese marketing and trading on the NCE, the overall trading activity on the Exchange from 1974 to 1993 and a detailed analysis of the trading of leading sellers and leading buyers during 1988-1993.

These analyses are based on various sources of information. Beginning in early 1992, DATCP sent Demands for Sworn Statements and Production of Documents to the National Cheese Exchange and to over 20 cheese manufacturers, marketers and traders that had been

active on the NCE in recent years. These Demands were based on DATCP's authority under ss. 93.14 to 93.16 and 100.20(6), Wisconsin Statues, and were made pursuant to DATCP's preliminary investigation of possible unfair trade practices or methods of competition.

In addition to information obtained in response to these Demands, and in some cases follow-up Demands, we obtained from the USDA copies of the minutes of all trading activity during each trading session of the NCE from 1973 through 1993 as recorded by USDA market news reporters. Together with legal counsel of DATCP, we interviewed representatives of all but a few of the companies receiving Demands, as well as other persons affiliated with the cheese industry. From time to time, we consulted with dairy marketing specialists at the University of Wisconsin. Extensive use was also made of various relevant secondary sources.

The report was prepared pursuant to an agreement between the Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) and the University of Wisconsin College of Agriculture and Life Sciences and College faculty members Professors Willard F. Mueller and Bruce W. Marion. It was agreed that in cooperation with DATCP, Professors Willard Mueller and Bruce Marion would prepare without cost to DATCP a study of cheese pricing and the NCE.

DATCP agreed, at its discretion, to provide the faculty members and certain support scientists with proprietary information obtained by DATCP. The faculty members agreed to protect the confidentiality of such information and not to release proprietary information without the department's written approval. The agreement also provided that the faculty members may publish any of their analyses provided they do not disclose proprietary information in violation of the agreement. The entire agreement appears in Appendix 1.A.

Organization of the Report

Chapter 2 provides an overview of the cheese subsector from the dairy farm to consumers. It indicates trends in consumption, the location and type of cheese manufactured, how milk and cheese prices are determined and the role of federal programs. The characteristics of cheese manufacturing, processing and marketing are described, along with the three major channels through which cheese is marketed. Estimates are provided of the concentration of sales in cheese manufacturing, processing and marketing. The business characteristics of major firms in the cheese subsector are described. This is the broadest and most descriptive chapter in the report and is essential reading to understand much of the rest of the report.

Chapter 3 examines various features of the National Cheese Exchange, including a brief history of predecessor exchanges dating from the 1860s; a description of the NCE's current organization and operating rules; a summary of agencies with regulatory authority over the NCE; and an overview of certain characteristics of the Exchange that create the potential for price volatility and market manipulation.

Chapter 4 examines the characteristics and motives of various companies as they may affect their interests in trading on the NCE and the spot markets. The analysis includes an examination of the business characteristics of leading traders, the reasons most cheese concerns trade in the spot market rather than on the NCE, and an examination of various documentary evidence relevant to these matters.

Chapter 5 analyzes the trading patterns of leading seller-traders and buyer-traders on the Exchange and the apparent impact the two groups of traders had on the level of NCE prices

during 1988-1993. We also make an econometric analysis of these traders' activity on NCE prices.

Chapter 6 is an in-depth analysis of Kraft's activity on the NCE during 1990-1992. It focuses on the nature and apparent impact of Kraft's trading activity on NCE prices during each period of a price cycle: the price decline, the price bottom, the price rise, and the price top. This analysis, based on trading activity and company documents, explores the apparent motives for Kraft's trading conduct and its consequences on NCE prices.

Chapter 7 provides a summary of the findings of the report, our conclusions regarding the matters studied, and some suggested private and public options that may improve the pricing process for cheese.

Acknowledgments

The authors wish to express their appreciation to the many persons who assisted in this undertaking. We received much cooperation and assistance from those companies served with Demands for information and documents, as well as the many persons we interviewed.

We are indebted to the various DATCP personnel with whom we collaborated in obtaining information for the report. Especially helpful were legal counsels Reid Klopp and Sherry Steffel, bureau director Robert Park prior to his retirement in July 1994, William Hughes until he left in July 1994, and Ann Roth.

Several university researchers were very helpful in our initial inquiry of cheese pricing, including our former graduate student in Agricultural Economics, Allan Krause, and undergraduate Gary Clough. Laura Hengehold worked as a full-time researcher during the second year of the project.

We were extremely fortunate in having knowledgeable and unselfish colleagues ever ready to share with us their special expertise. We are particularly indebted to Professors Peter Helmberger, Jean Paul Chavas, and Reuben Buse for their productive consultations on econometric matters. Likewise, we are indebted to Professors Edward Jesse and Robert Cropp for instructing us in the more arcane aspects of dairy marketing.

Finally, we extend our unqualified appreciation to Ardella Crawford, who typed our many drafts and whose editing of the manuscript extirpated the more egregious malapropisms.

The authors are proud to join the many past and present faculty members of the Department of Agricultural Economics who have studied cheese marketing. These include such distinguished economists as Henry C. Taylor, the first chair of the department, George S. Wehrwein, Benjamin H. Hibbard, Asher Hobson, Rudolph K. Froker, Hugh Cook, Truman Graf, Edward Jesse and Robert Cropp.

Our research was made possible by special USDA grant funds to the Food Systems Research Group of the Department of Agricultural Economics and the support of the College of Agriculture and Life Sciences.

Appendix 1.A

AGREEMENT

STATE OF WISCONSIN DEPARTMENT OF AGRICULTURE, TRADE AND CONSUMER PROTECTION

UNIVERSITY OF WISCONSIN

The State of Wisconsin Department of Agriculture, Trade and Consumer Protection ("department"), the University of Wisconsin College of Agricultural and Life Sciences ("college"), and college faculty members Prof. Willard F. Mueller and Prof. Bruce Marion ("faculty members") hereby agree as follows:

WHEREAS, the department is currently engaged in a study and analysis of market practices related to the purchase and sale of cheese, including transactions on the National Cheese Exchange; and

WHEREAS, college faculty members Prof. Willard Mueller and Prof. Bruce Marion ("faculty members"), and support staff scientists working for those faculty members, are also currently engaged in a study and analysis of market practices related to the purchase and sale of cheese, including transactions on the National Cheese Exchange; and

WHEREAS, the above studies and analyses are important to the State of Wisconsin, and to the state's dairy economy, and constitute an important and legitimate function of both the department and the college; and

WHEREAS, the interests of the department and the college will be mutually served by collaboration in the pursuit of the above studies and analyses; and

WHEREAS, the department is authorized by law to obtain proprietary information from private firms, including possible trade secrets, which may be necessary to complete the above studies and analyses; and

WHEREAS, the department is obliged to preserve the confidentiality of trade secrets under s. 134.90, Stats.; and is responsible for deciding whether other proprietary information received by the department may be released to the public;

NOW, THEREFORE, the following parties, in consideration of mutual benefits derived, agree as follow:

1. In cooperation with the department, college faculty members Prof. Willard Mueller and Prof. Bruce Marion ("faculty members") agree to perform a study and analysis of market practices related to the purchase and sale of cheese, including transactions on the National Cheese Exchange, and to make the results of that study and analysis available to the department. The college agrees that the faculty members may perform this

study and analysis in their capacity as faculty members of the college.

2. For purposes of the above study, the department will, in its discretion, provide the faculty members with proprietary information obtained by the department. The faculty members will protect the confidentiality of all proprietary information received from the department, and will establish reasonable security measures to protect the confidentiality of that information. The faculty members will not release proprietary information without the department's prior written approval.

3. Solely for purposes of the above study and analysis, the faculty members may give their support staff scientists access to proprietary information received from the department, provided that the support staff scientists are individually identified to the department in advance, and provided that the support staff scientists agree to protect the confidentiality of the information. The faculty members are responsible for ensuring that their support staff scientists protect the confidentiality of any proprietary information provided to them.

4. No faculty member or support staff scientist who receives proprietary information under this agreement will use that information in any way that could result in the receipt of anything of value for himself or herself, for his or her immediate family, or for any other person or organization, unless the department has made that information available to the public.

5. This agreement does not prohibit a faculty member or support staff scientist from publishing any study or analysis, provided that the publication does not disclose proprietary information in violation of this agreement.

6. This agreement does not prohibit the release or publication of proprietary information with the prior written approval of the department.

Signed this 24th day of February, 1992.

STATE OF WISCONSIN
DEPARTMENT OF AGRICULTURE,
TRADE AND CONSUMER PROTECTION

By _____
Alan T. Tracy, Secretary

Signed this 10 day of February, 1992.

By Willard F. Mueller
Prof. Willard F. Mueller
Principal Investigator

Signed this 10 day of February, 1992.

By Bruce W. Marion
Prof. Bruce Marion
Principal Investigator

Signed this 14th day of February, 1992.

UNIVERSITY OF WISCONSIN

By R W Erickson
Robert W. Erickson
Director, Research Administration
-- Financial

Chapter 2--Organization and Characteristics of Cheese Industry

A. Introduction

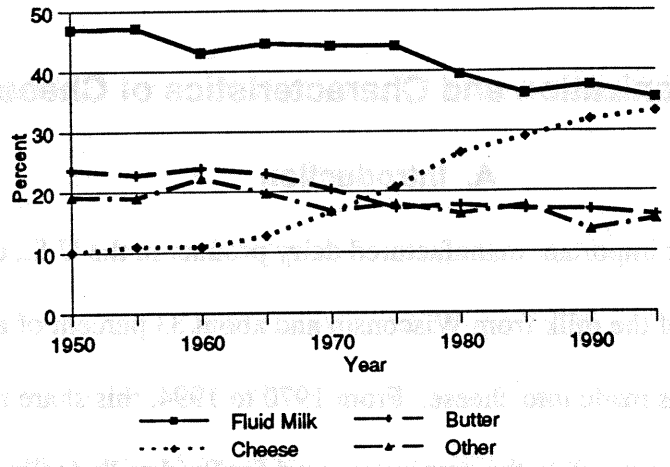
Cheese is the most important manufactured dairy product in the U.S., currently commanding 85 percent of the milk from Wisconsin and about 33 percent of all milk in the U.S. A growing share of milk is made into cheese. From 1970 to 1994, this share nearly doubled from 17 percent to 33 percent, while the proportion used for fluid milk declined from 46 percent to 36 percent (Figure 2.1).

Wisconsin is by far the leading cheese producer, accounting for about 30 percent of all U.S. natural cheese manufactured in 1994. California ranked a distant second with 14 percent, followed by Minnesota and New York (Figure 2.2).

Cheese manufacturing has become more dispersed geographically. Between 1940 and 1994, Wisconsin's share of U.S. cheese production declined from 52 percent to 30 percent. The share produced in Wisconsin, Minnesota, Iowa and Illinois went from 60 to 45 percent, the share produced in California and Idaho, two leading western states, increased from 4 to 18 percent, and the share accounted for by the two leading eastern states (New York and Pennsylvania) increased from 9 to 14 percent. The leading eight states in 1940 and 1994 accounted for the same proportion of all cheese manufactured (78 percent), but the dominance of the North Central states declined substantially (Appendix Table 2.2).

American style (includes cheddar, colby, monterey, jack, washed and stirred curd) and mozzarella cheeses accounted for 75 percent of natural cheese produced in 1994 (Figure 2.3). The manufacture of mozzarella has expanded rapidly in the U.S. and in Wisconsin: from

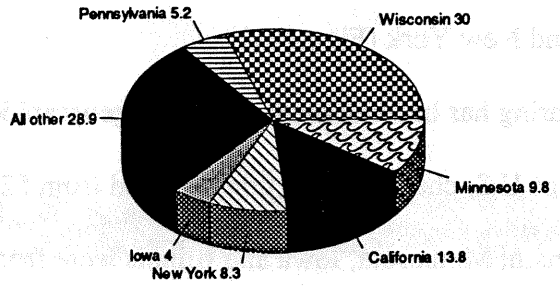
Figure 2.1. Utilization of Milk: United States, Selected Years



Source: Wisconsin Dairy Facts, 1995, Wisconsin Department of Agriculture, Trade and Consumer Protection

Figure 2.2 Total Production of Natural Cheese by States, 1994

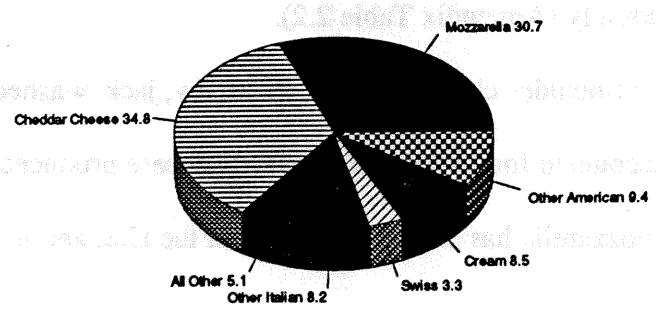
Percent of U.S. Cheese



.Source: Dairy Products, 1994 Summary, National Agricultural Statistical Service, USDA, May 1995

Figure 2.3. Natural Cheese Production in the U.S.

Percent by Type, 1994



Source: Dairy Products, 1994 Summary, National Agricultural Statistical Service, USDA, May 1995

1970 to 1992 production of American cheese in the U.S. doubled, while production of Italian cheese (80% of which was mozzarella) increased six fold.

B. Cheese Imports and Exports

Since 1980, U.S. cheese imports have been about 5 percent of total U.S. production (Appendix Table 2.1). Between 1980-1986 and 1987-1995, imports share declined modestly, partly because of a decrease in U.S. cheese support prices, from $1.40 per pound for blocks in 1981-83 to $1.12 per pound by 1990. Also affecting imports has been the significant growth in U.S. produced specialty cheeses that compete directly with some imported cheese. For example, cheese plants in Wisconsin now produce varieties such as Havarti, Brie, and Gruyere.

Most imported cheese falls in the specialty category and thus competes only in the specialty cheese niche. As a result, imports have relatively little influence on U.S. prices for such mainstream cheeses as cheddar and mozzarella.

Small though they are, imports are several times as large as exports (Appendix Table 2.1). Cheese exports dropped from 1.5 percent of U.S. production in the mid 1980s to about 0.5 percent in the early 1990s. From 1992 to 1995, export share of total production doubled, but in 1995, imports were still five times as large as exports. To date, exports are largely a non-event in the cheese industry.

C. Cheese Consumption in U.S.

Cheese is one of the few dairy products for which consumption has increased substantially since 1980. Per capita consumption of all cheese in the U.S. was 27 pounds in 1994, more than double the 11.5 pounds in 1970, and up 50 percent from 17.5 pounds in 1980. The growth in consumption of American cheeses since 1980, however, was only 18 percent,

with most of the overall increase occurring in non-American cheese, especially Italian. For both American and Italian type cheeses, there has been substantial growth in the more convenient forms of cheese (i.e., shredded, sliced, grated, individual wrapped, etc.).

Studies of cheese demand have concluded that, overall, cheese consumption is relatively price inelastic at retail. Gould and Lin estimated that all cheese combined has a price elasticity of demand of -0.57.[1] That is, a 10 percent increase in average cheese prices would result in a 5.7 percent decline in consumption. This result is similar to the elasticity estimates of others.[2] However, as one moves from the retail level back to the cheese factory, demand becomes even more inelastic. For raw material cheese, such as that priced on the NCE, the elasticity of demand may be only -0.25, i.e., a 10 per cent increase in cheese prices would lead to a 2.5 percent decline in quantity taken.

The quantity consumed of specific types of cheese is more price sensitive. For example, the price elasticity estimates for natural American, other natural, American and other processed, and processed snack at retail are respectively -1.07, -1.43, -.44 and -1.12. Specific types of cheese are more price sensitive than all cheese because of the ability of consumers to substitute one type of cheese for another.

Cheese consumption rises with increases in income. Estimates of income elasticity range

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1 Brian Gould and H.C. Lin, "The Demand for Cheese in the United States: The Role of Household Composition," *Agribusiness* 10: 43-59, 1994.

2 W.T. Boehm and E.M. Babb, "Household Consumption of Storable Manufactured Dairy Products," Department of Agricultural Economics, Purdue University, West Lafayette, IN, Agricultural Experiment Station Bulletin no. 85, 1975. D. Heien and Cr. Wessells, "The Demand for Dairy Products: Structure, Prediction, and Decomposition," *AJAE*, 70(2), 219, 1988.

from .045[3] to 0.32.[4] An income elasticity of 0.20 means that as real income increases 10 percent, cheese consumption increases by 2 percent.

D. Seasonality of Production, Consumption, and Commercial Stocks

During the period 1988-1993 cheese production peaked during March through June at about 4 percent above average due to flush milk production during those months (Figure 2.4).[5] Average *daily* production then dropped sharply during July, August and September to about 4 percent below average.

Data on the seasonality of cheese consumption are not readily available. Figure 2.5 indicates the seasonality of cheese sales through retail food stores. *Daily* retail sales of cheese peak in December and trough in July and August. Note that this chart ignores that portion of cheese used in food service establishments or as ingredients by food manufacturers. By most estimates, these latter two channels account for 60 to 65 percent of the cheese usage in the U.S. Seasonal peaks and valleys in cheese usage are more pronounced for retail sales than for food service/industrial sales.

Figure 2.6 shows the seasonal pattern of *commercial disappearance*, a term which refers

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[3] Gould and Lin, *op. cit.*

[4] J. Blaylock and D. Smallwood, "Effects of Household Socioeconomic Features on Dairy Purchases," *Technical Bulletin* No. 1686, USDA Economic Research Service, Washington, D.C., 1983; "U.S. Demand for Food, Household Expenditures, Demographics, and Projections," *Technical Bulletin* No 1714, USDA Economics Research Service, Washington, D.C., 1988.

[5] The sources for Figures 2.4-2.7 are:
- Figure 2.4--Dairy Products, 1988-1993 Annual Summaries, NASS, USDA.
- Figure 2.5--Unpublished data from ERS, USDA.
- Figure 2.6--Dairy Products, Annual Summaries, NASS, USDA; Dairy Market Statistics, Annual Summaries, AMS, USDA; and ASCS Commodity Fact Sheet, USDA.
- Figure 2.7--Dairy Market Statistics, Annual Summaries, AMS, USDA.

Figure 2.4. Seasonal Variation in Total Cheese Production, 1988-1993
Adjusted for Number of Calendar Days in Each Month

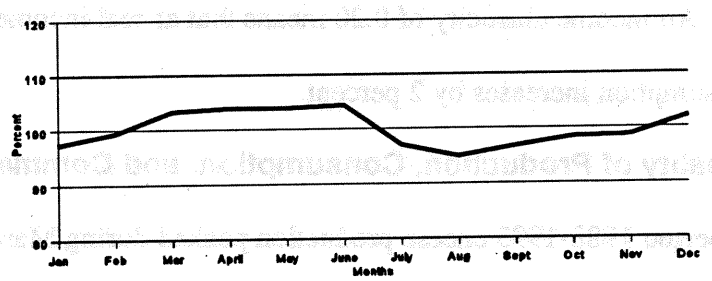


Figure 2.5. Seasonal Variation in Retail Sales of All Cheese, 1982-1991
Adjusted for Number of Calendar Days in Each Month

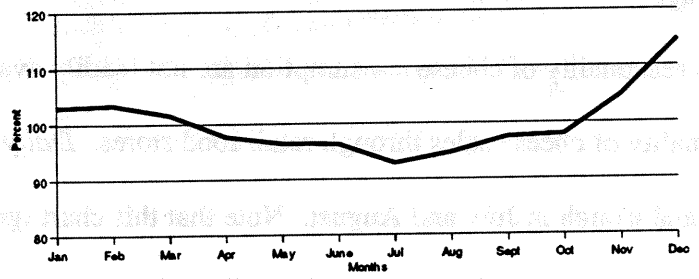


Figure 2.6. Seasonal Variation in Commercial Disappearance of Total Cheese, 1988-1993
Adjusted for Number of Calendar Days in Each Month

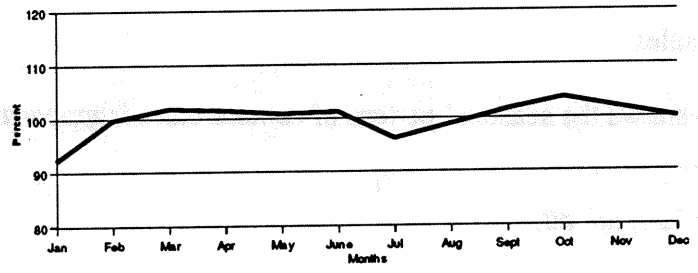
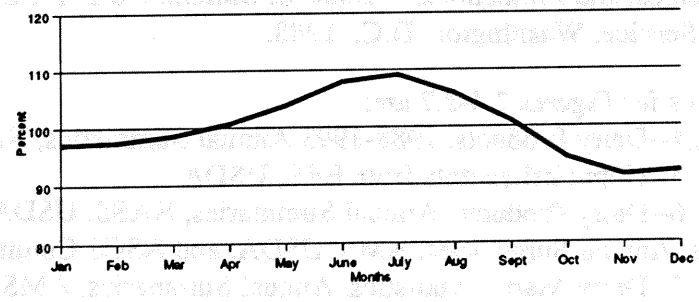


Figure 2.7. Seasonal Variation in End-of-Month Commercial Stocks of All Cheese, 1988-1993



to bulk cheese usage for all purposes. For 1988-1993, *daily* commercial disappearance peaked in October at about 4 percent above average, and hit lows in January and July at 8 percent and 4 percent below average, respectively.

Commercial disappearance in August, September and October increases for two reasons: (a) wholesale level demand increases in anticipation of increased retail sales when school begins and (b) companies build finished good inventories for peak retail sales in November and December. Cheese cut and wrap operations begin building finished product inventories in September; inventories peak in mid-November prior to the surge in retail sales in December.

Monthly commercial stocks (Figure 2.7) reflect the combined effects of Figures 2.4-2.6. On average, inventories of bulk cheese, referred to as commercial stocks, grow during April through July and decline thereafter as inventories are used to compensate for low cheese production and to allow the building of finished good inventory. Commercial stocks typically reach a low in November, the same month in which finished good inventories peak.

E. Pricing of Milk at Farm Level

The pricing of milk and dairy products in the U.S. is quite complex. However, the main features of the pricing system are relatively simple.[6]

1. Two grades of milk: Grade A milk can be used for fluid as well as manufactured products, while Grade B milk is referred to as "manufacturing grade" and can be used

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[6] Two regional extension leaflets by Jesse and Cropp provide somewhat expanded but very understandable discussions of milk pricing. Ed Jesse and Bob Cropp, "What Determines Your Milk Check? Part 1: Manufacturing Grade Milk," N.C. Regional Extension Pub. 217-16, University of Wisconsin-Madison, March 1993; "What Determines Your Milk Check? Part II: Grade A Milk," N.C. Regional Extension Pub. 217-17, University of Wisconsin-Madison, August 1993.

only for nonperishable manufactured dairy products. Grade A milk producers are subject to more stringent sanitation and quality regulations than Grade B producers.

Much Grade A milk, however, is used for manufactured products. In 1994, only 7 percent of U.S. milk was Grade B; however, 63 percent of all milk (Grades A and B) was used for manufactured products.

2. Federal price support system: The Federal government sets a floor under manufacturing grade milk prices by offering to buy three manufactured dairy products--cheddar cheese, butter and non-fat dry milk--at "support" prices, which vary over time. Restrictions on imports of manufactured dairy products allow the U.S. price support system to function quite independently of global supply and demand.

3. Federal Marketing Orders: Seventy percent of U.S. milk was sold under the 38 Federal milk marketing orders in 1994; about 20 percent was sold under state orders. Federal orders determine the minimum prices paid for Grade A milk, depending on its use. A central feature of milk marketing orders is classified pricing, whereby Class I milk, that used for fluid products, is priced at a premium (Class I differential) over Class III milk, which is used for manufactured products.[7] The base Class I differential at Eau Claire, Wisconsin is $1.04 per hundredweight.

Milk marketing orders also establish distance differentials for Class I milk. The base Class I differential increases by approximately 21 cents per hundredweight for each 100 miles distance from Eau Claire, Wisconsin, to markets east of the Rocky Mountains.

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[7] Class I prices are calculated as the Class III price two months earlier plus the Class I differential. Changes in Class I prices therefore lag by 2 months changes in Class III prices.

For example, Class I milk prices in southern Florida are approximately $3.00 per hundredweight higher than in Minneapolis-St. Paul.

Cooperatives often are able to negotiate an "over order premium" for Class I milk. These premiums averaged $0.81 per hundredweight for 1994. Minimum federal order prices for Class III milk are the same in all markets (BFP for current month). However, Class III pay prices may also exceed the order minimum in markets where cheese manufacturing is important. In Minnesota and Wisconsin, for example, cheese plants competing with one another for milk may pay $.50-1.00 per hundredweight more than the established Class III price.[8]

4. Basic Formula Price (previously the M-W price): As of May 1, 1995, the Minnesota-Wisconsin (M-W) price was replaced by the Basic Formula Price (BFP). The BFP and M-W price are slightly different ways of estimating the average price for manufacturing grade (B) milk that was paid by cheese and butter-powder plants in Minnesota and Wisconsin. The BFP is even more directly linked to National Cheese Exchange prices than was the M-W price. For example, the February BFP equals the average actual pay price for milk by cheese and butter-powder plants in January, plus the change in the *value* of manufactured milk in February based upon changes in cheese, butter and non-fat dry milk prices. In this calculation, NCE prices receive about 90 percent weight while butter-powder prices receive 10 percent.

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[8] Actual Class III prices can also be less than the order minimums because cooperatives are exempt from the minimum price requirements of marketing orders. This mainly affects those orders in which cooperatives are major converters of Grade A milk into cheese and butter/powder (i.e., Class III uses). Proprietary cheese plants, unlike cooperative cheese plants, must pay the minimum Class III price.

Changes in the BFP largely drive farm prices throughout the U.S. Minimum Class II and III milk prices are tied directly to the BFP: market order Class III prices are identical to the current month's BFP and Class II prices are the BFP two months earlier plus 30 cents per hundredweight. Class I minimum prices are generally equal to the BFP two months earlier plus a Class I differential. Since Class I differentials change little over time in particular orders, price movements for much of the milk in the U.S. are based on BFP changes.

As this indicates, there is a close linkage between NCE prices and the Basic Formula Price for manufacturing grade milk, and also a tight linkage between BFP and the price received for milk by farmers in Wisconsin and throughout the U.S.

5. Blend Price: Farmers covered by marketing orders receive a "blend price" for their milk that represents the class prices in their marketing order times the proportion of milk used for each class. For example, the blend price received by dairy farmers in South Florida was 15.85 per hundredweight in 1994 (83 percent of milk in the order was used for Class I). By comparison, the blend price in the Upper Midwest order for 1994 was 12.15 per hundredweight (17 percent was used for Class I).

F. Cheese Pricing

Since 1981, the U.S. Congress has established the support price for manufacturing grade milk. The U.S. Department of Agriculture determines the price the Commodity Credit Corporation (CCC) will pay for bulk cheddar cheese, butter and nonfat dry milk in order to achieve the support price for milk. Thus, the CCC price for cheddar blocks and barrels provides a floor for cheese prices. However, since 1987, cheese prices have rarely dropped to the support

level. Whereas the CCC was an active buyer of cheese and was a major influence on prices during 1980-87, this was not true during 1988-94. In the latter period, with the CCC price at a relatively low level, the market price for cheese generally was well above the support price (Figure 2.8).

During 1980-1987, the CCC program also had a tendency to set a ceiling on cheese prices by selling government stocks of cheese back to the commercial market. Since 1981, the minimum CCC sales price has been set at 110 percent of the CCC purchase price for cheese at the time of the sale. As Figure 2.9 indicates, CCC stocks rose sharply in the early 1980s and peaked in 1983-84 at nearly 800 million pounds. This massive inventory was liquidated during the following four years, in part by cheese give-away programs and in part by sales back to the commercial market. Whenever market prices rose to 10 percent above the support price, cheese sales by the government tended to slow further price increases. By the end of 1988, however, CCC stocks were largely eliminated. Since then, the CCC program has no longer been an important constraint on the upward movement of cheese prices.

When the CCC price is not operative, the price "opinion" of the National Cheese Exchange (NCE) in Green Bay, Wisconsin, is the major basis for bulk cheese prices in the U.S. The NCE and CCC prices for cheddar blocks from 1978 to 1994 are shown in Figure 2.8. As cheese prices became more market-driven in the late 1980s, the volatility of cheese prices increased sharply. Hence, since mid-1988, the NCE has become more important in the price discovery process. Prior to that time, NCE prices were largely constrained by CCC support prices and sell-back provisions.

As Figure 2.8 indicates, the seasonality of cheese prices increased greatly during 1988-

Figure 2.8: NCE and CCC Block Cheese Prices
Weekly: 1978-94

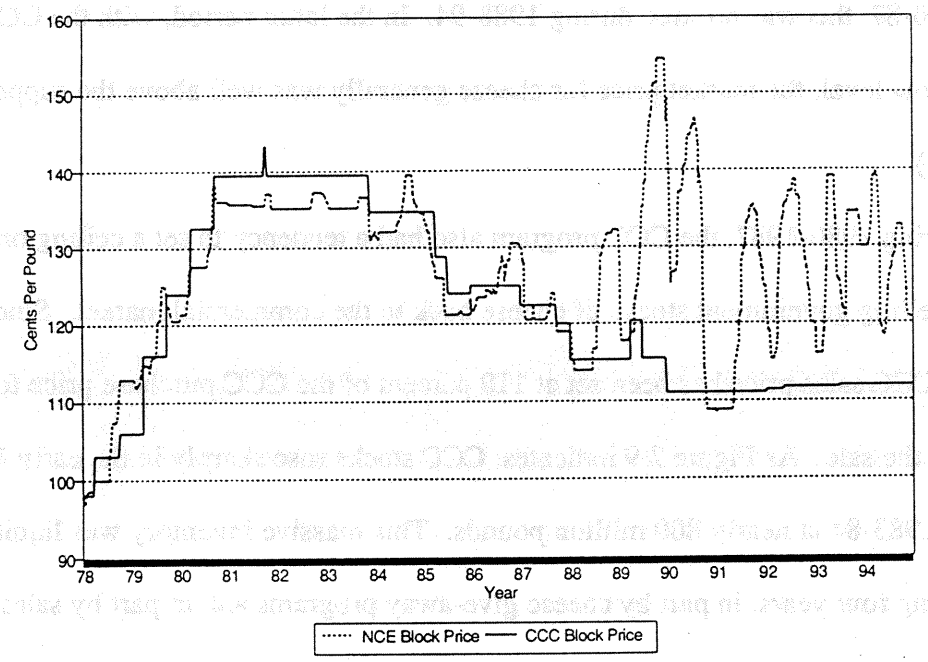
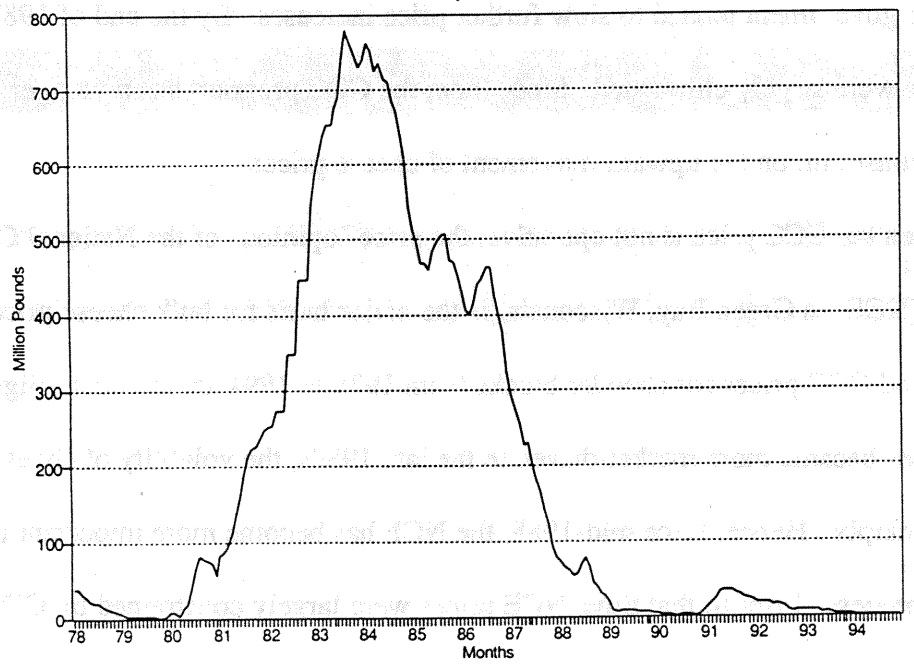


Figure 2.9: CCC Stocks of Natural Cheese
Monthly, 1978-94

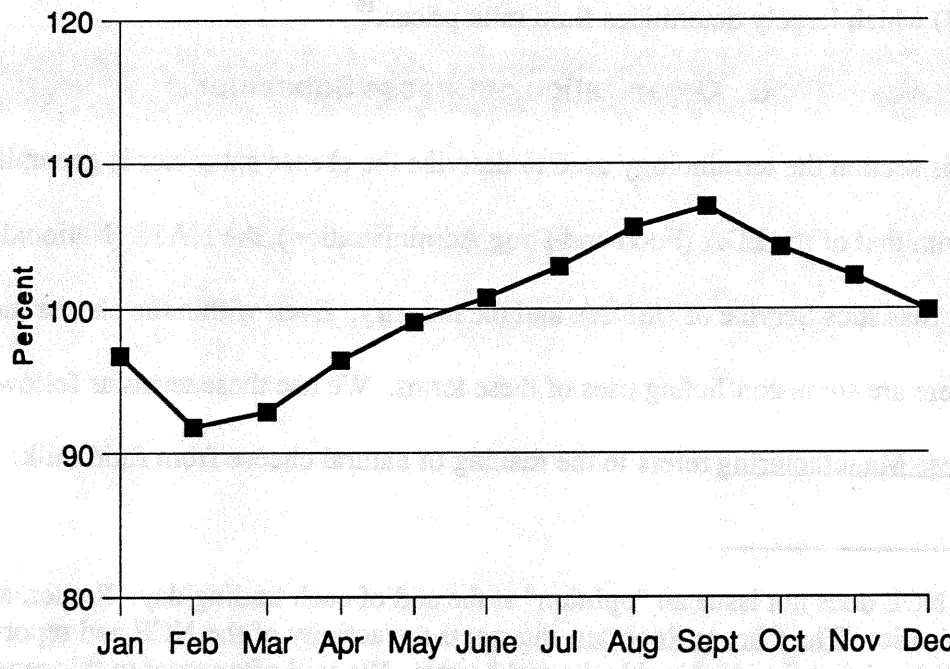


Source: Dairy Market Statistics, Annual Summaries, AMS, USDA

1994. With low support levels, cheese prices were allowed to move in response to supply-demand conditions and other factors. Figure 2.10 indicates that prices during 1988-1993, on average, bottomed in February and peaked in September. On average, prices had a 15 percent swing from low to high.

By comparison, during 1980-1987, the seasonality in cheese prices was largely eliminated by the influence of the CCC support price, which generally held constant throughout the year. During this 8 year period, there was only a 3 or 4 percent seasonal swing in cheese prices.

Figure 2.10. Seasonal Variation in NCE Block Prices, 1988-93 Average



The NCE "opinion price" is widely used by the industry as a national index of the value of bulk cheese.[9] The prices set by NCE activity each Friday provide the basis for most of the transactions in bulk cheese during the following week. Since less than 1 percent of total cheese production is usually sold on the NCE, the Exchange has a disproportionate amount of leverage in its effects.

The prices established on the NCE not only largely determine the prices cheese manufacturers receive for raw material or bulk cheese, but also greatly influence prices of other dairy products. Dairy marketing economists often characterize NCE prices as *driving* manufactured milk prices which, in turn, importantly determine fluid milk prices. A leading cheese marketer characterized the importance of cheese prices as follows:

> Cheese is the most important manufacturing product in the dairy industry in terms of value and influence. *Cheese* heavily influences manufacturing milk prices (known as the M/W) which largely determines fluid milk prices.[10]

G. Organization of Cheese Subsector

In this section the terminology used to describe the cheese subsector is generally consistent with that of the FDA (Food and Drug Administration), the NASS (National Agricultural Statistics Service of USDA), and the industry. Even within the cheese industry, however, there are some conflicting uses of these terms. We use these terms as follows:

Cheese Manufacturing refers to the making of natural cheese from fluid milk. Since milk

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[9] The NCE does not issue an "opinion" at the end of each trading day. Rather, a trade publication, The Cheese Reporter, interprets the activity of the NCE and reports its market opinion for cheddar blocks and barrels. We will often refer to this reported "opinion" as the "opinion price," or the NCE price.

[10] Kraft General Foods, *Cheese Procurement Strategy*, Operations, December 6, 1989, KGF 2948, 2959. Emphasis added.

is the major input, it accounts for roughly 80 to 85 percent of the cost of cheese. On average, 10 pounds of milk produce 1 pound of cheese. Natural cheese includes American style cheeses (cheddar, colby, monterey, jack), Italian cheeses (mozzarella, provolone, parmesan, Romano, ricotta), Swiss, brick, Muenster, blue, cream and various specialty varieties. Cottage cheese is not considered a natural cheese.

Cheese Processing refers to the conversion of natural cheeses to processed cheese products. Processed cheeses are made by grinding, emulsifying and blending natural cheese and other ingredients (usually with the aid of heat). The natural varieties most often used in processed cheese are cheddar, colby and Swiss. The FDA and NASS recognize three main types of processed cheese products.

1) *Processed cheese*: Up to 5 percent of the butterfat weight may come from non-cheese inputs such as cream. Processed cheese accounts for 55 percent of the tonnage of processed cheese products.

2) *Processed cheese foods and spreads*: Cheese ingredients must account for not less than 51 percent of the weight of the final product. Other dairy ingredients that can be combined with cheese include cream, milk, skim milk, buttermilk, and cheese whey. Processed cheese foods and spreads account for 40 percent of the tonnage of all processed cheese products.

3) *Cold pack cheese and cheese foods*: Differ from the above two groups of products in that heat is not involved in the emulsifying process. "Cold pack cheese" is analogous to processed cheese but is made without heat. Cold pack products account for 5 percent of the tonnage of all processed cheese products.

Cheese Converters refers to those companies and plants that convert bulk natural cheese (often in 40-pound blocks or 500-pound barrels) into either processed cheese products or into finished natural cheeses. The conversion of natural cheese into finished natural cheeses occurs in "cut-wrap" plants or operations. Bulk natural cheese is cut, sliced, shredded, grated and packaged into a variety of package types and sizes.

Cheeese Manufacturing

Figure 2.11 portrays the overall organization of the cheese subsector. Natural cheese manufacturing is the first stage of the cheese subsector after milk supply. In 1994, there were 449 cheese manufacturing plants in the U.S. each producing, on average, 15 million pounds of cheese per year. This compares with 737 cheese plants in 1980, each with an average production of 5.4 million pounds.[11]

Wisconsin accounted for 34 percent of all cheese plants in the U.S. and 30 percent of cheese produced in 1994. One-third of Wisconsin's cheese plants produced over 10 million pounds of cheese annually (average production of these plants was 34.8 million pounds). These plants accounted for 86 percent of Wisconsin production in 1994. By comparison, only 11 percent of Wisconsin plants produced over 10 million pounds per year in 1980, and accounted for 54 percent of Wisconsin cheese production.[12]

The number of Wisconsin plants making less than 5 million pounds of cheese per year has dropped sharply: 423 in 1971, 269 in 1980 and 85 in 1994. Over this 23-year period, the

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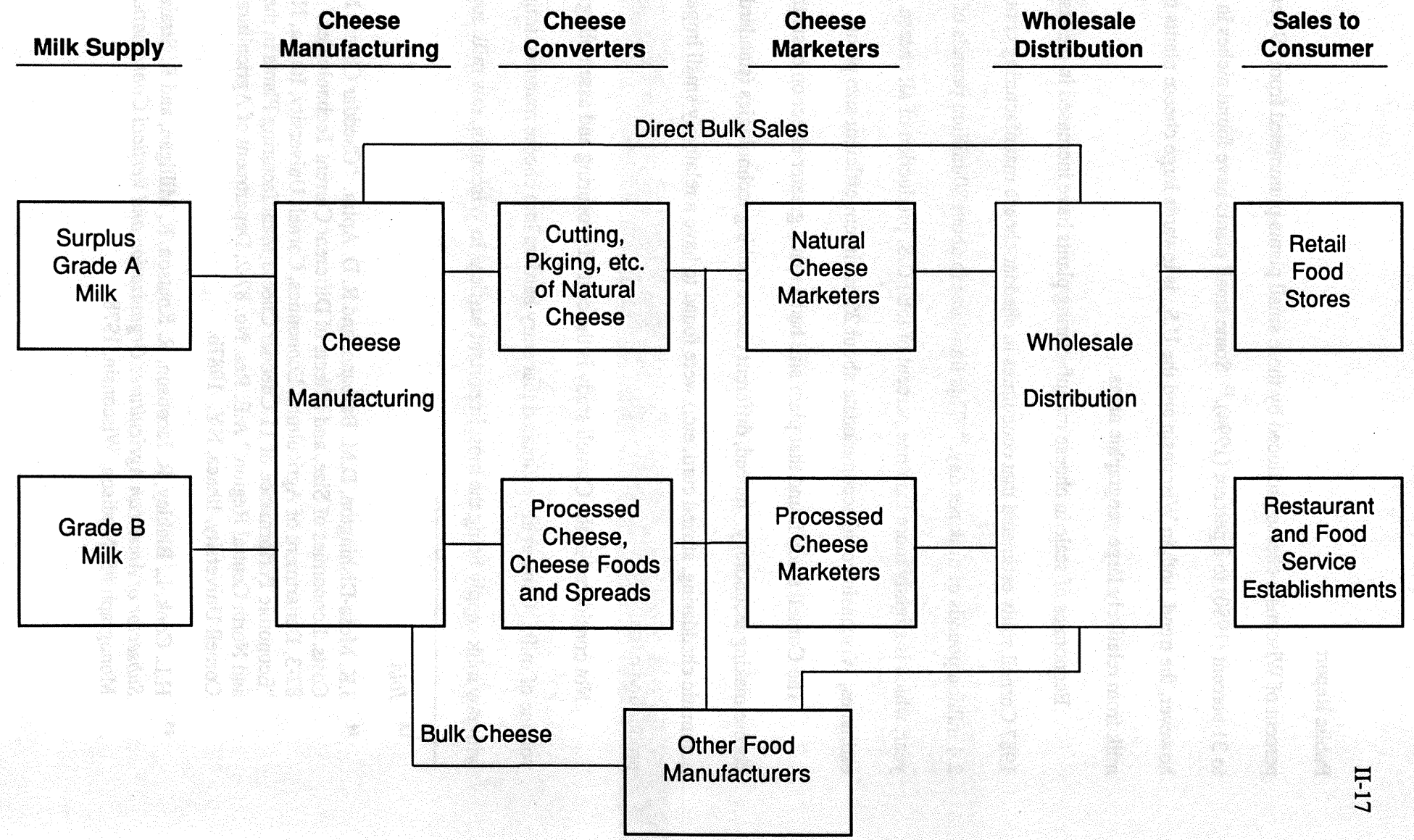
[11] National Agricultural Statistics Service (NASS), USDA, "Dairy Products, 1994 Summary," Washington, D.C., May 1995.

[12] Wisconsin Department of Agriculture, Trade & Consumer Protection, "1995 Wisconsin Dairy Facts," Madison, Aug 1995.

Figure 2.11. Organization of Cheese Subsector



percent of Wisconsin cheese produced by these small plants plummeted from 59 percent in 1971 to 31 percent (1980) to 8 percent (1994).[13] Some small plants have found niches in the market; however, the trend, both in Wisconsin and the U.S., is towards large cheese plants that draw milk from relatively large geographic areas.

Economies of scale in cheese manufacturing plants have increased in the last 20 years. A 1987 Cornell study estimated that economies in cheddar cheese manufacturing continued out to 2.4 million pounds of milk per day.[14] This translates to about 80 million pounds of cheese per year, which is slightly more than one percent of total U.S. production of all cheese. Using these estimates, Wisconsin could accommodate about 25 minimum-efficient size plants.

The Cornell study found that plant size had a much greater effect on costs than did cheese making technology. Indeed, different cheese making technologies (standard cheddaring, automatic cheddaring, stirred curd, etc.) were found to have a relatively small impact on production costs.

Not considered in the Cornell study is the cost of procuring and assembling the needed volume of milk. Cook et al[15] estimated that entry barriers into cheese manufacturing are low--with raw milk supply being the most important barrier. In Wisconsin, raw milk supply

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[13] *Ibid.*

[14] J.K. Mesa-Dishington, D.M. Barbano, and R. D. Aplin. "Cheddar Cheese Manufacturing Costs, Economies of Size, and Effects of Different Current Technologies," A.E. Res. No. 87-3, Department of Agricultural Economics, Cornell University, Ithaca, NY. 1987a. "Economic Performance of 11 Cheddar Cheese Manufacturing Plants in the Northeast and North Central Region," A.E. Res. No. 87-2, Department of Agricultural Economics, Cornell University, Ithaca, NY. 1987b.

[15] H.L. Cook, L. Blakley, R. Jacobson, R. Knutson, R. Milligan, and R. Strain, *The Dairy Subsector of American Agriculture: Organization and Vertical Coordination*, NC117 Monograph #5, Madison, Wisconsin, 1978.

continues to be the greatest barrier to entry for a large, efficient cheese plant. The larger the plant, the farther that plant will have to reach to obtain a sufficient supply of milk.

Natural cheese is made in a variety of flavors, shapes and sizes. American style cheese, which accounts for nearly half of all natural cheeses, is made in 40 lb. blocks, 640 lb. blocks and 500 lb. barrels. The 40 lb. blocks are used primarily for "cutting" cheese; barrel cheese is used primarily for processed cheese; and 640 lb. blocks may be used for either purpose. Italian and Swiss cheeses are usually made in slightly different sizes.

Of the 449 cheese manufacturing plants in the U.S. in 1994, 54 percent made at least some American style cheese, and 35 percent made at least some Italian cheese. A relatively small proportion of plants were able to make either American or Italian cheeses. Such plants are referred to as "balancing" plants, as are plants that can pack either barrel or block cheese. Plants that make either or both American and Italian type cheeses probably account for nearly 90 percent of cheese plants. The remaining plants make other cheese varieties such as Swiss, Muenster, Brick and Cream.

Table 2.1 provides a summary of cheese produced and sold in 1987 and 1992. In 1992, 6,488 million pounds of natural cheese were manufactured in the U.S. Of this, about 1,652 million pounds were converted into 2,203 million pounds of processed cheese products (e.g., cheese slices or loafs) and 4,923 million pounds were marketed in the U.S. as natural cheese (e.g., cheddar, colby, Swiss, mozzarella, parmesan, cream, blue, etc.). We estimate that, on average, 0.75 pounds of natural cheese is used to make 1 pound of processed cheese products. After adjusting for changes in cold storage stocks, imports and exports, and government

Table 2.1. Natural and Processed Cheese Produced and Marketed in the U.S., 1987 and 1992

Type of Cheese	1987		1992	
		(Millions of Pounds)		
Natural Cheese Manufactured:				
American style	2716.7		2936.6	
Italian	1799.8		2508.6	
Cream	330.1		447.0	
Swiss	227.2		237.0	
All other	270.6		359.1	
Total Natural Cheese Mft	5344.4		6488.3	
Increase (+) or Decrease (-) in Stocks	+329		-45.0	
Imports Less Exports	+177		+199	
Less Government Removals	-304.2		-67.0	
Total Commercial Usage in U.S.	5546.2		6575.3	
Marketed as Natural Cheese		4074.9[a]		4923.3[a]
Processed Cheese Products				
Processed cheese	1188.5		1347.7	
Processed cheese foods, spreads & cold pack	773.2		855.0	
Total Processed Cheese Products		1961.7		2202.7
Total Natural and Processed Cheese Sold		6036.6		7126.0

[a] Assumes 0.75 pound of natural cheese in 1 pound of processed cheese products, on average.
Source: NASS, USDA, Dairy Products, 1987 and 1992 Summaries, May 1988 and 1993.

removals, total commercial usage of natural cheese in the U.S. increased from 5.5 billion pounds in 1987 to 6.5 billion pounds in 1992.

Economic Markets for Cheese Manufacturers

Different types of natural cheese are often poor substitutes for each other from the standpoint of the buyer/user. However, when determining economic product markets, one must consider the substitutability on the supply side as well as the demand side. On the supply side, there is a reasonable degree of substitution across cheese types. A significant minority of plants have the ability to produce several types of natural cheese, particularly cheddar and mozzarella.[16] This has the effect of placing most natural cheese within the same product market at the manufacturing stage. Because shipping costs are low relative to value, the geographic market for manufactured cheese is national. Thus, market share and concentration figures for all natural cheese manufacturing for the U.S. would be a useful measure of the structure of this market. The six leading natural cheese manufacturers, four of them cooperatives, are shown in Table 2.2.

Cheese Converters: Processed Cheese

From the cheese manufacturing plant, roughly three-fourths of the cheese is marketed through various channels as natural cheese. The remaining one-fourth goes to processing plants where it is converted to one of the three types of processed cheese. In a few instances cheese manufacturing plants also process cheese, but for the most part, processing plants are separate.

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[16] The flexibility of cheese manufacturing to produce different types of cheese has limits. Occasionally the rapid growth in demand of certain cheeses, such as mozzarella, has exceeded the growth in manufacturing capacity and has resulted in inflated prices for that variety of cheese in the short-to-intermediate term.

In 1994, there were only 55 processing plants which produced 2295 million pounds of processed cheese products.[17]

There are at least two major submarkets for processed cheese: 1) food retailing firms, and 2) food service and industrial firms. Some cheese processors have a strong position in one of these submarkets but are little involved in the other. Table 2.3 identifies the leading processors/marketers of processed cheese products and the submarkets which they serve. Comparing Tables 2.2 and 2.3, Schreiber and Borden are leading cheese processors that buy nearly all of their natural cheese needs. Kraft, Land O' Lakes, AMPI and Beatrice are leaders in both cheese manufacturing and processed cheese production. Although Kraft is a large manufacturer, it buys much more American cheese than it manufactures. Indeed, cheese used for Kraft's processed cheese business accounted for over three-fourths of the cheese purchased by Kraft in 1991. Beatrice also buys much more American cheese than it makes, whereas Land O' Lakes and AMPI manufacture nearly all of the American cheese they use.

Converters and Marketers of Natural Cheese

Bulk natural cheese, as produced in cheese manufacturing plants, must be converted into the form, size and package desired by the end-user. For example, forty pound blocks of sharp cheddar may be cut into consumer-size chunks and packaged for sale in supermarkets, or shredded and packed in 5-pound bags for use in Mexican restaurants. Mozzarella may be cut

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[17] National Agricultural Statistical Service (NASS), USDA, "Dairy Products, 1994 Summary," Washington, D.C. May 1995.

Table 2.2. Leading Manufacturers of Natural Cheese

	Amer	Mozz	Other	Self-Mft as percent of: All Cheese Sold	Self-Mft as percent of: American Cheese Used*
Kraft General Foods, Inc.	x		x	25-50%	< 25%
Beatrice Cheese, Inc.		x	x	50-75	< 25
American Milk Producers, Inc. (c)	x			75-100	75-100
Land O' Lakes, Inc. (c)	x			75-100	75-100
Mid-America Dairymen, Inc. (c)	x	x		75-100	75-100
Wisconsin Dairies (c)	x	x		75-100	75-100

*American Cheese used to make processed cheese products or cut and wrapped into finished natural cheese.

Table 2.3. Leading Processors/Marketers of Processed Cheese Products

	Retail	Food Service/Industrial
Kraft General Foods, Inc.	x	x
Schreiber Foods, Inc.	✓	x
Land O' Lakes, Inc.	x	x
American Milk Producers, Inc.		x
Borden, Inc.	x	
Beatrice Cheese, Inc.	✓	x

Table 2.4. Leading Marketers of Natural Cheese

	Amer	Mozz	Other	Retail	Fd Serv/Indust.
Kraft General Foods, Inc.	x	✓	x	x	✓
Beatrice Cheese, Inc.	✓	x	x	✓	x
Schreiber Foods, Inc.	x			x	✓
Sargento Foods, Inc.	x	x		x	
Land O' Lakes	x			x	✓
American Milk Producers, Inc.	x			x	
Mid-America Dairymen, Inc.	x	x			x

x = Major emphasis
✓ = Significant presence
c = cooperative

Source for Tables 2.2, 2.3, and 2.4: December 1993 survey of companies by the Wisconsin Department of Agriculture, Trade and Consumer Protection.

into chunks or shredded and packed in a variety of bag sizes for sale to supermarkets, pizza chains, or frozen pizza manufacturers. Parmesan cheese is usually grated and packed in a variety of containers. In the main, natural cheese cut and wrap operations are in separate plants from either cheese manufacturing or cheese processing.

With one exception (Marathon Cheese Co.),[18] the leading converters of natural cheese are also the leading marketers of natural cheese to retail, food service and industrial customers. The leading marketers of natural cheese are shown in Table 2.4. Here we find Sargento, a company not listed on Tables 2.2 and 2.3, which has become the second most important advertised brand of cheese sold through retailers. It has been especially successful in developing consumer demand for shredded and grated cheese in closable bags. Sargento buys virtually all of its bulk cheese from other cheese manufacturers.

Some cheese marketers emphasize sales to the retail grocery industry, while others sell mostly to food service or industrial customers. And, this emphasis may vary by type of cheese. For example, Schreiber's sales of processed cheese products are particularly strong in its food service/industrial business. However, its sales of natural cheese are stronger to the retail channel.

Kraft's sales of both processed and natural cheeses are heavily weighted toward the retail channel. Beatrice, by comparison, sells a high proportion of both processed and natural cheeses to the food service channel.

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[18] Marathon is a large company that co-packs natural cheese for other cheese companies only. Although it cuts, shreds, grates, slices and packages about 5 percent of the natural cheese that is sold as natural cheese, Marathon does not sell to retail or food service end users. Thus, it is a converter, but not a marketer of natural cheese. Marathon manufactures a tiny portion of the cheese it packs.

Importance of Different Channels

There are three major channels through which cheese is marketed:

- Retail food stores
- Food service outlets
- Industrial users

Retail food stores include supermarkets and other retail outlets at which cheese is purchased mainly for at-home consumption. Food service outlets include restaurants, institutional feeding facilities (e.g., hospitals, schools, prisons), airlines and other places that provide food for consumption away-from-home. Industrial users are mainly food manufacturers that use cheese as an ingredient in products like frozen pizza, macaroni and cheese dinners, salad dressings, frozen entrees, snack foods and other products.

Most cheese companies distinguish the retail channel from the other two and often lump the food service and industrial business together. It may not make much difference whether a company is selling 5 pound bags of shredded mozzarella to Pizza Hut (food service channel) or to Tombstone (industrial channel).

The National Dairy Board (NDB) and the Wisconsin Milk Marketing Board (WMMB) have made estimates of the percentage of cheese sold through the different channels. Because they employ different methodologies, the two organizations arrive at different figures.[19] We

[19] The NDB relies on MRCA panel data for information on consumer purchases of cheese for at-home consumption. The NDB does a survey of food service establishments to estimate cheese usage in that channel. The industrial channel is then estimated as the residual: commercial disappearance minus retail sales and food service usage. For 1992, the NDB estimated 34 percent of all cheese was sold retail, 38 percent was used in food service, and 28 percent went to industrial users.

WMMB recently updated their estimates of cheese usage by channel. WMMB

believe the WMMB figures are more carefully developed than NDB figures. Using natural cheese equivalent pounds, WMMB estimates that in 1993, 40 percent of cheese pounds were sold retail, 44 percent were used in food service firms and 16 percent were used by other food manufacturing companies (Table 2.5).

The Group A cheeses in Table 2.5 are those cheese varieties for which production is tracked by NASS. Group B cheeses include 16 additional varieties, the most important of which are colby, monterey jack and cojack. These three American style cheeses account for about 70 percent of the Group B tonnage.[20]

The natural cheese poundage in Table 2.5 may be sold as natural cheese or be converted into processed cheese products. We estimate that in 1993, 1682 million pounds of natural cheese (mostly American) were converted into 2243 million pounds of processed cheese products. If the pounds of processed cheese are included in Table 2.5, the total pounds of cheese sold increases from 6800 to 7361 million pounds. These calculations assume that on average 0.75 lbs. of natural cheese are used to make one pound of processed cheese products. Approximately 55 percent of processed cheese products are sold through the retail channel, 36 percent to foodservice outlets and 9 percent to industrial users.[21]

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estimates NDB figures for food service are 18 percent low. WMMB adjusts NDB data on retail sales using current estimates of cheese sales in convenience stores and club stores, and random weight cheese sales in supermarkets. Finally, WMMB has developed independent estimates of industrial cheese usage.

[20] Group B also includes Asiago, Brie/Camembert, Edam/Gouda, feta, Fontina, fresh mozzarella, goat, Havarti, Hispanic, Limburger, Manchego, Mascarpone, and Pecorino.

[21] Wisconsin Milk Marketing Board, "WMMB Cheese Channel Volume Segmentation Study," Madison, WI, November 1995.