

# Contents

<b>List of Figures</b> .....	vi
<b>List of Tables</b> .....	viii
<b>Chapter 1 Introduction</b>	
<b>Organization of the Report</b> .....	I-3
<b>Acknowledgments</b> .....	I-4
<b>Chapter 2 Organization and Characteristics of Cheese Industry</b>	
A. <b>Introduction</b> .....	II-1
B. <b>Cheese Imports and Exports</b> .....	II-3
C. <b>Cheese Consumption in U.S.</b> .....	II-3
D. <b>Seasonality of Production, Consumption, and Commercial Stocks</b> .....	II-5
E. <b>Pricing of Milk at Farm Level</b> .....	II-7
F. <b>Cheese Pricing</b> .....	II-10
G. <b>Organization of Cheese Subsector</b> .....	II-14
<b>Cheese Manufacturing</b> .....	II-16
<b>Economic Markets for Cheese Manufacturers</b> .....	II-21
<b>Cheese Converters: Processed Cheese</b> .....	II-21
<b>Converters and Marketers of Natural Cheese</b> .....	II-22

	Importance of Different Channels .....	II-25
	Market Share and Concentration Figures .....	II-28
	Retail Cheese Sales .....	II-30
	Vertical Linkages in Cheese Subsector .....	II-33
H.	Characteristics of Major Firms in Cheese Subsector .....	II-34
	Role of Cooperatives .....	II-35
	Appendix 2.A. Comparison of NASS and Census Data on Tonnage of Cheese Produced ..	II-37

### Chapter 3 Origins and Nature of the National Cheese Exchange

A.	History of NCE .....	III-1
B.	Current Organization of NCE .....	III-7
C.	Regulation of the NCE .....	III-9
D.	The NCE is a Thin Market .....	III-10
	Previous Empirical Studies of Thin Markets .....	III-16
	Trading Volume on NCE .....	III-18
	Number and Relative Size of Traders .....	III-23

### Chapter 4 Motives of NCE Traders

A.	Functions of the NCE .....	IV-1
B.	Purchases and Sales Patterns .....	IV-7
	Trading Activity in Barrels and Blocks .....	IV-13
	Trading Activity of Brokers .....	IV-14
	Conclusions .....	IV-14
C.	Business Characteristics of Leading Traders .....	IV-15
	Kraft General Foods, Inc. ....	IV-16
	Borden, Inc .....	IV-19
	Alpine Lace Brands, Inc. ....	IV-22
	Beatrice Cheese, Inc. ....	IV-23
	Schreiber Foods, Inc .....	IV-25
	Agricultural Cooperatives .....	IV-26
	Brokers: Dairystate Brands, Inc. ....	IV-28
	Other Traders .....	IV-29
	Summary .....	IV-31

D.	Spot Trading as Alternative to the NCE .....	IV-31
	NCE vs. Spot Sales of Kraft .....	IV-37
E.	Evidence of Trader Motives .....	IV-48
	Evidence of Kraft's Motives .....	IV-48
	Evidence of Other Leading Traders' Motives .....	IV-51
F.	Summary and Conclusions .....	IV-63

## Chapter 5 Trader Activity-Price Relationships

A.	Introduction .....	V-1
B.	Overview of Trader Activities .....	V-2
C.	Trading Patterns of Various Traders .....	V-5
	Trading Activity of Kraft .....	V-5
	Trading Patterns of Other Leading Traders .....	V-9
	Seller-Trader Activity in Barrels .....	V-10
	Buyer-Trader Activity in Barrels .....	V-11
	Trader Activity in Blocks .....	V-12
D.	Trader Activity-Price Relationships .....	V-13
	Kraft Activity-Price Relationships .....	V-13
	Activity-Price Relationships of Leading Seller- and Buyer-Traders .....	V-17
E.	Trading to Signal Competitors and to Influence the Block-Barrel Spread .....	V-20
	Trading to Signal Competitors .....	V-20
	Trading to Influence the Block-Barrel Price Spread .....	V-22
F.	Econometric Examination of Trader-Price Relationships .....	V-23
	The Economic Model .....	V-24
	The Econometric Model .....	V-26
	Variables, Data and Hypotheses .....	V-29
	Estimation and Results .....	V-32
	WAP Prices .....	V-35

### Appendix 5.A.

	Kraft's Trading Activity During 1986 and 1987 .....	V-37
--	---	------

## Chapter 6 Kraft Trading Activity During 1990-1992

A.	Price Decline and Price Bottom, January-March 1990 .....	VI-1
	The Price Decline .....	VI-3
	The Price Bottom .....	VI-7
	Summary of Kraft Conduct at Price Bottom .....	VI-8
B.	Price Rise, Top and Decline, April 6-November 2, 1990 .....	VI-15
	Summary of Kraft Conduct .....	VI-20
C.	Price Cycle November 1990-February 1992 .....	VI-25
	The Price Bottom, November 1990-May 10, 1991 .....	VI-25
	The Price Rise May 17, 1991-September 26, 1991 .....	VI-28
	The Price Top and Subsequent Decline, September 1991-February 1992 ..	VI-32
	Summary of Kraft Conduct .....	VI-32
D.	Price Cycle February 1992-December 1992 .....	VI-33
	Overview of 1992 .....	VI-33
	Pricing Conduct Over Price Cycle .....	VI-35
	Summary of Kraft Conduct .....	VI-37
E.	Relationship between NCE Prices and Kraft's Wholesale Prices .....	VI-38
F.	Summary and Conclusions .....	VI-53

## Chapter 7 Summary, Conclusions, and Policy Initiatives

A.	Introduction .....	VII-1
B.	Cheese Pricing and the NCE .....	VII-2
C.	Potential Problems of Thin Markets .....	VII-3
D.	NCE Functions and Trader Motivations .....	VII-5
E.	Business Characteristics of Leading Traders .....	VII-7
F.	Spot Trading as an Alternative to the NCE .....	VII-11
G.	Trading Activity of Leading Traders, 1988-1993 .....	VII-15
H.	Kraft Trading Activity 1990-1992 .....	VII-18

I. Econometric Analysis ..... VII-19

J. Conclusions ..... VII-21

K. Public and Private Initiatives to Improve Price Discovery ..... VII-33

    The Problem of Trading Against Interest ..... VII-34

    Prohibiting Trading Against Interest ..... VII-36

    Trading Limits ..... VII-37

    Alternative Basis for Formula Pricing Cheese ..... VII-38

    Price Report for Direct Spot Transactions ..... VII-39

    Electronic Marketing Systems ..... VII-41

    Public and Private Actions to Improve Market Information ..... VII-43

    Futures Trading in Cheese ..... VII-45

Appendix 7.A

Thin Market/Formula Pricing Problems in Other Agricultural Commodities .... VII-48

About the Authors

## List of Figures

2.1.	Utilization of Milk: United States, Selected Years .....	II-2
2.2.	Total Cheese Production by States, 1992 .....	II-2
2.3.	Natural Cheese Production in the U.S. ....	II-2
2.4.	Seasonal Variation in Total Cheese Production, 1988-1993 .....	II-6
2.5.	Seasonal Variation in Retail Sales of All Cheese, 1982-1991 .....	II-6
2.6.	Seasonal Variation in Commercial Disappearance of Total Cheese, 1988-1993 .....	II-6
2.7.	Seasonal Variation in End-of-Month Commercial Stocks of All Cheese, 1988-1993 .....	II-6
2.8.	NCE and CCC Block Cheese Prices .....	II-12
2.9.	CCC Stocks of Natural Cheese .....	II-12
2.10.	Seasonal Variation in NCE Block Prices, 1988-93 Average .....	II-13
2.11.	Organization of the Cheese Subsector .....	II-17
3.1.	Barrel and Block Sales on NCE, 1989-93 .....	III-20
4.1.	NCE Block Trading, August 24, 1990 .....	IV-59
5.1a,b,c.	Kraft Activity on NCE, July 1988-June 1993 .....	V-6-8

A-5.1a-5.1e. NCE Barrel Activity of Leading Traders, July 1988-June 1993 .....	V-49-53
A-5.2a-5.2e. NCE Block Activity of Leading Traders, July 1988-June 1993 .....	V-54-58
A-5.3. Kraft Activity on NCE, July 1986-June 1988 .....	V-59
6.1. NCE and CCC Barrel and Block Cheese Prices, Weekly, 1990-1992 .....	VI-2
6.2. Commercial Stocks of American Cheese, 1988-1993; CCC Stocks of Natural Cheese, 1988-1993 .....	VI-9
6.3. Kraft Planned and Actual Raw Material Cheese Inventory, 1989-1992 .....	VI-23
6.4. Kraft Net Price of Processed Cheese, NCE Barrel Price and Kraft Price-NCE Price Margin, Monthly, 1989-1991 .....	VI-44
6.5. Kraft Net Price of Natural Cheese, NCE Block Price and Kraft Price-NCE Price Margin, Monthly, 1989-1991 .....	VI-44
6.6. U.S. Retail Price of Natural Cheese, NCE Block Price and Retail Price-NCE Price Margin .....	VI-50
A6.1. Kraft/Private-Label Price Gap at Retail, by Type, 1988-1992 .....	VI-79
A6.2. Kraft, Borden, and Private Label Brands of American Cheese, Average Retail Price and Price Gaps, 1988-1992 .....	VI-80

## List of Tables

2.1.	Natural and Processed Cheese Produced and Marketed in the U.S., 1987 & 1992 . .	II-20
2.2.	Leading Manufacturers of Natural Cheese . . . . .	II-23
2.3.	Leading Processors/Marketers of Processed Cheese Products . . . . .	II-23
2.4.	Leading Marketers of Natural Cheese . . . . .	II-23
2.5.	Estimate of Cheese Usage by Channel, 1993 (Mil. Of Lbs., Natural Equivalents . . . .	II-27
2.6.	Supermarket Sales by Type of Cheese, U.S., 1992 . . . . .	II-31
2.7.	Dollar Market Shares of Leading Cheese Brands and Companies, U.S. Supermarket Cheese Sales, 1992 . . . . .	II-31
A2.1	Cheese Imports and Exports as Percent of Total Cheese Production, 1980-1995 . . .	II-39
A2.2	Total Cheese Production by State: 1940, 1950, 1960, 1980, 1994 . . . . .	II-40
3.1.	Volume of Cheese Traded on the NCE, 1974-1993 . . . . .	III-19
3.2.	Frequency of Price Changes Associated with Various Types of Trading Activity, 1988-1993 . . . . .	III-22
3.3.	Seller Concentration on the National Cheese Exchange, 1974-1993 Barrel and Block Sales . . . . .	III-27
3.4.	Buyer Concentration on the National Cheese Exchange, 1974-1993 Barrel and Block Purchases . . . . .	III-28
A3.1.	Number of Cheese Companies and Share of Value of Shipments by Leading Cheese Manufacturers, 1947-1987 . . . . .	III-30

A3.2. Number of Cheese Plants in Wisconsin and United States, 1850-1992 .....	III-31
A3.3a. Seller Concentration on the National Cheese Exchange, 1974-1993, Barrel Sales .....	III-32
A3.3b. Seller Concentration on the National Cheese Exchange, 1974-1993, Block Sales .....	III-33
A3.4a. Buyer Concentration on the National Cheese Exchange, 1974-1993, Barrel Purchases .....	III-34
A3.4b. Buyer Concentration on the National Cheese Exchange, 1974-1993, Block Purchases .....	III-35
4.1. Trades on NCE by Primary Type of Business, 1980 to 1987 .....	IV-9
4.2. Trades on NCE by Primary Type of Business, 1988 to 1993 .....	IV-10
4.3. Kraft Gains or Losses on Raw Material Cheese Sales: NCE, Outside Sales, and Government, 1987-1992 .....	IV-41
4.4. Comparison of Prices Kraft Received for Spot Sales with NCE Prices, 1989-1992 .....	IV-42-43
A4.1a. Trades on NCE by Primary Type of Business, 1980 to 1987, Barrels .....	IV-66
A4.1b. Trades on NCE by Primary Type of Business, 1980 to 1987, Blocks .....	IV-67
A4.2a. Trades on NCE by Primary Type of Business, 1988 to 1993, Barrels .....	IV-68
A4.2b. Trades on NCE by Primary Type of Business, 1988 to 1993, Blocks .....	IV-69
A4.3. Gains or Losses Incurred by Kraft for Raw Material Cheese Sales NCE, Outside Sales, and Government, 1987-1992 .....	IV-70-71
A4.4. NCE Opinion Prices, Average Wisconsin Assembly Point (WAP) Prices and Premiums, Weekly, 1986-1993 .....	IV-72-81

5.1.	Types of Trading Activity by Leading Traders of Barrel and Block Cheese on the NCE, 1988-1993 .....	V-3
5.2.	Price Behavior During Trading Days Kraft was Active and not Active on NCE, 1988-1993 .....	V-15
5.3.	Price Behavior During Trading Days Kraft was Active and not Active on NCE, 1988-1993 .....	V-16
5.4.	Price Behavior on Days in Which at Least One of the Leading Traders in Each Group was Active, 1988-1993 .....	V-19
5.5.	Estimated Relationship Between Trader Activity Variables and NCE Prices .....	V-33
A5.1a.	Types of Trading Activity by Leading Traders of Barrel Cheese on the NCE, 1988-1993 .....	V-40
A5.1b.	Types of Trading Activity by Leading Traders of Block Cheese on the NCE, 1988-1993 .....	V-41
A5.2.	Price Behavior on Days in Which at Least One of the Leading Traders in Each Group was Active, 1988-1993 .....	V-42
A5.3.	Price Behavior in Days Kraft, Borden and Alpine Lace Were Active in NCE Trading, 1988-1993 .....	V-43
A5.4.	Price Behavior in Days Beatrice, Mid-Am, Schreiber and AMPI Were Active in NCE Trading, 1988-1992 .....	V-44
A5.5.	Estimates of Factors Affecting Monthly NCE Barrel Prices, 1988-1993 .....	V-45
A5.6.	Estimates of Factors Affecting Monthly NCE Block Prices, 1988-1993 .....	V-46
A5.7.	Estimates of Factors Affecting Monthly WAP Barrel Prices, 1988-1993 .....	V-47
A5.8.	Estimates of Factors Affecting Monthly WAP Block Prices, 1988-1993 .....	V-48
6.1.	Kraft's Estimated Gross Profit Margins for Processed and Natural Cheese, 1989-1991 .....	VI-46
6.2.	Kraft Reported Retail Cheese Sales and Estimated Lost Retail Sales, 1989-1992 .....	VI-49

A6.1. Kraft Bulk Cheese Inventory, Receipts, Usage, and Sales .....	VI-58
A6.2. Adjusted CCC Purchases (Contract Basis) by Regions, Weekly, October 12, 1990-September 26, 1991 .....	VI-59
A6.3. End-of-Month Commercial Stocks of American Cheese and CCC Stocks of Natural (Blocks and Barrels) Cheese, 1980-89 .....	VI-60
A6.4a. Kraft Share of Retail Cheese Sales, by Type, 1988-1992 .....	VI-61
A6.4b. Kraft Share of Retail Cheese Sales, by Type, 1988-1992 .....	VI-62
A6.4c. Kraft Brand Retail Cheese Sales, by Type, 1988-1992 .....	VI-63
(Sales in Millions of Pounds)	
A6.4d. Kraft Brand Retail Cheese Sales, by Type, 1988-1992 .....	VI-64
(Sales in Millions of Dollars)	
A6.5a. Private Label Brands Share of Total Retail Cheese Sales, by Type, 1988-1992 (Share of Pounds Sold) .....	VI-65
A6.5b. Private Label Brands Share of Total Retail Cheese Sales, by Type, 1988-1992 (Share of Dollar Sales) .....	VI-66
A6.5c. Total Retail Sales of Private Label Cheese Brands, by Type, 1988-1992 (Millions of Pounds) .....	VI-67
A6.5d. Total Retail Sales of Private Label Cheese Brands, by Type, 1988-1992 (Millions of Dollars) .....	VI-68
A6.6a. Total Retail Cheese Sales by Type, 1988-1992 (Millions of Pounds) .....	VI-69
A6.6b. Total Retail Cheese Sales by Type, 1988-1992 (Millions of Dollars) .....	VI-70
A6.7. Kraft and Private Label Retail Cheese Prices and Price Gaps, by Types, 1988-1992 .....	VI-71-72
A6.8. Average Retail Price Per Pound of Kraft, Borden, and Private Label Brand American Cheese .....	VI-73
A6.9a. Market Shares of Company Brand Sales of Processed Cheeses .....	VI-74
A6.9b. Market Shares of Company Brand Sales of Natural Cheeses .....	VI-75

Public Report

A6.9c. Market Shares of Company Brand Sales of Cream Cheese ..... VI-76

A6.10. Average Retail Prices of Kraft and Private Label Brands ..... VI-77

A6.11. Retail Prices of Natural and Processed Cheese,  
Leading Brands, 1981-1990 ..... VI-78