

Periodic Table of Dairy Pricing and Risk

Product, Pricing, and Hedging Elements

1	1 \$/cwt RM Raw Milk	2 \$/lb BF Butterfat	3 \$/lb PR Protein	4 \$/lb LC Lactose	5 Index EN Energy					ID Unit SYM Name	
	Element Structure: ID: Market number Unit: Price unit SYM: Trading symbol Name: Product/instrument										
2	6 \$/cwt CI Class I	7 \$/cwt CII Class II	8 \$/cwt CIII Class III	9 \$/cwt CIV Class IV							
3	10 \$/lb Ch Cheddar	11 \$/lb Mo Mozzarella	12 \$/lb CC Cream Cheese	13 \$/lb Bu Butter	14 \$/lb Wh Whey	15 \$/lb NF NFDM	16 \$/gal Yo Yogurt	17 \$/gal FM Fluid Milk	18 \$/lb IC Ice Cream	19 \$/lb PC Process Cheese	
4	20 \$/lb Bl CME Block	21 \$/lb Ba CME Barrel	22 \$/lb Bt CME Butter	23 \$/lb Wy CME Whey	24 \$/lb NM CME NFDM						
5	25 200K lbs M3 Class III Fut	26 200K lbs M4 Class IV Fut	27 44K lbs CS Cheese Fut	28 44K lbs DW Dry Whey Fut	29 40K lbs BT Butter Fut	30 44K lbs NF NFDM Fut	31 44K lbs BC Block Cheese				
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Market Categories

- 1. Raw Inputs
- 2. USDA Classes
- 3. Physical Products
- 4. CME Spot Prices
- 5. Futures Contracts
- 6. Options
- 7. Risk Management
- 8. Analytics

Reference Guide

Pricing Formulas

Model	Formula
Cost-Plus	$P_{\text{sell}} = \frac{P_{\text{milk}}}{Y} - C_{\text{whey}} + C_{\text{processing}} + M_{\text{margin}}$
Index-Based	$P_{\text{sell}} = P_{\text{index}} \pm \text{Basis}$
Multi-Component	$P_{\text{cream cheese}} = 0.4 \times P_{\text{butterfat}} + 0.6 \times P_{\text{NFDM}} + C_{\text{proc}} + M_{\text{margin}}$
Milk Crush Margin	$\text{Crush Margin} = (P_{\text{cheese}} \times Y_{\text{cheese}} + P_{\text{whey}} \times Y_{\text{whey}}) - P_{\text{milk}}$
Basis Calculation	Basis = Mailbox Price – Class III Milk Price

Market Interaction Patterns

Type	Elements	Relationship
Vertical Flow	RM → CI → Ch → Bl → M3	Supply chain progression
Horizontal Groups	Ch, Mo, CC within Period 3	Substitutable products
Derivative Chains	M3 → O3 (Class III to Options)	Financial derivatives
Basis Relationships	Ch ↔ Bl (Cheddar ↔ CME Block)	Price correlation
Hedge Complexes	RM + M3 + CS combinations	Risk management strategies
Processing Margins	Input costs vs output values	Profitability analysis

Raw Inputs (Period 1)

Symbol	Element	Unit & Role
RM	Raw Milk	\$/cwt - Major cost driver
BF	Butterfat	\$/lb - High-value component
PR	Protein	\$/lb - Quality determinant
LC	Lactose	\$/lb - Processing factor
EN	Energy	Index - Operating costs

USDA Classes (Period 2)

Symbol	Element	Primary Use
CI	Class I	Drinking milk - highest price
CII	Class II	Yogurt, ice cream
CIII	Class III	Hard cheeses - key benchmark
CIV	Class IV	Butter, powder

Physical Products (Period 3)

Symbol	Element	Market Role
Ch	Cheddar	Major cheese benchmark
Mo	Mozzarella	Follows cheddar pricing
CC	Cream Cheese	Butterfat-linked
Bu	Butter	Class IV driver
Wh	Whey	Revenue credit

CME Spot Markets (Period 4)

Symbol	Element	Function
Bl	CME Block	Primary cheese index
Ba	CME Barrel	Process cheese index
Bt	CME Butter	Daily price discovery
Wy	CME Whey	By-product valuation
NM	CME NFDM	Protein pricing

Futures & Options (Periods 5-6)

Symbol	Contract	Size/Type
M3	Class III Futures	200K lbs
M4	Class IV Futures	200K lbs
CS	Cheese Futures	44K lbs
O3	Class III Options	Various
O4	Class IV Options	Various
OC	Cheese Options	Various

Risk Management & Analytics (Periods 7-8)

Symbol	Strategy/Metric	Purpose
Hd	Hedging	Price protection
Bs	Basis Management	Correlation risk
Cr	Crush Spread	Margin hedging
Mg	Margin Tracking	Profitability
Vo	Volatility	Risk measurement
HR	Hedge Ratio	Position sizing