A New Cheese Pricing Model

INTRODUCTION
Simmering discontent with prevailing methods for cheese price discovery has, of late, occasionally boiled over. Extreme volatility and persistent concerns about market viability and integrity are driving a growing consensus among market participants: improvements are necessary. Cheese prices are discovered today in the much the same way they were discovered 10, 15 and 25 years ago. While a brief cash auction for cheddar cheese may have provided adequate price discovery in the comparatively docile 70s and 80s, it seems ill-suited for what has become a far more dynamic marketplace.

True, since 1999, trading has been conducted at the CME on a daily basis, ostensibly providing greater immediacy, anonymity and access. But the market still falls short of optimal on all three counts.

Moreover, there is a sense that the products being traded – 40-pound-block and barrel cheddar cheese – are not sufficiently representative of broader cheese market fundamentals.

Every day, the industry (across the spectrum) contends with a price discovery mechanism that lacks liquidity, can complicate commercial transactions, inhibits risk management and fails to engender confidence.

In short, the industry – from producer to end-user -- collectively deserves better. And, is now in a position to have it. We believe a better way is well within the industry’s grasp. Our proposed solution: using the existing Class III milk futures contract as the central price discovery arena for cheese across the United States. In our estimation, effecting a change to futures-based price discovery would provide solutions to many of the problems plaguing the current system.

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A BRIEF HISTORY
The search for a market mechanism to establish cheese prices can be traced to the late 19th century. As early as 1873, cheese plants sought a means for establishing prices for their cheese. Initially, there were “dairy boards” established in Wisconsin, giving manufacturers a forum for calling attention to their product and freeing prospective buyers from the burden of going from plant-to-plant to meet their needs. In 1890 “call boards” were established whereby actual offers to buy and sell cheese were posted on a blackboard. Then in 1918, the Wisconsin Cheese Exchange was established. Eventually the name was changed to the Green Bay Cheese Exchange and, later, the National Cheese Exchange (NCE).

Trading rules were revised several times, but by 1936 the NCE was the predominant price discovery forum for cheese. Early on, three varieties were traded in Green Bay: American, brick and Swiss. By the late 1960s, however, the focus narrowed, with only cheddar cheese in 40-pound blocks and 500-barrels exchanged.

The NCE opened its doors one day a week – Friday – for a half hour of trading. The price established on the Exchange was used the following week by cheese sellers and cheese buyers for transactions of most all types of cheese.

Despite its influence, the NCE was consistently viewed as a market of last resort. For most years, less than 1% of the national cheddar cheese production was sold on the NCE. Sellers would only offer product in Green Bay if they had failed to find buyers at prevailing prices in the day-to-day market. Likewise, buyers would only buy in Green Bay if they were unable to find willing sellers in the private market at prevailing prices.

Allegations of price manipulation were common, periodically triggering investigations by the Federal Trade Commission and the Wisconsin Department of Agriculture. But, through it all, most of the cheese industry continued to support the NCE as a good barometer for cheese prices.

By 1990, however, the NCE was finding itself subject to increased scrutiny for lack of competition and concerns about price manipulation. From 1988 to 1993, there were few buyers and sellers active on the Exchange: just four traders accounted for 74% of all sales.

Higher profile investigations and potential for Wisconsin legislative initiatives ultimately spelled the demise of the National Cheese Exchange. Traders gathered for a final session on April 25, 1997.

The next week, on May 1, 1997, cash trading shifted to the Chicago Mercantile Exchange. The CME was a logical choice in that it had long hosted a weekly butter cash session and was home to a fledgling complex of dairy futures contracts.

Trading at the CME offered one explicit change and a host of implicit differences from the NCE model.
In Green Bay, trading was not anonymous. Firms dispatched representatives to the NCE to transact business. Sales were reported with a firm name attached to both sides. In Chicago, execution was to be performed by CME members at the behest of industry clients. Accordingly, transaction details were to be ostensibly anonymous beyond the names of the participating floor brokers.

Beyond that, the CME offered a time-tested market regulation and financial clearing structure. While the cash markets are technically exempt from Commodity Futures Trading Commission (CFTC) oversight, the CME had years of experience market oversight and rule enforcement. And, the CME clearing structure offers a measure of financial security that mitigates counter-party credit risk.

In 1999, an additional change was made: the cash session was to be conducted daily instead of weekly.

Lingering concerns about price competition at the NCE prompted the USDA to create a weekly survey of cheese prices (the “NASS survey”) to use in milk price formulas as part of the Federal Order Reform process. (The California system, however, uses the CME price.) But, since buyers and sellers of cheese continue to use the CME cash cheese prices as the basis for establishing transaction prices, the NASS cheese price survey mirrors CME prices.

Yet, after seven years, it seems clear that cash trading at the CME has not increased price competition. The core issues are familiar: trading is dominated by just a few firms and liquidity is poor, with volume representing a small fraction of cheddar production.

In 2003, 699 carloads of cheese traded representing about 1% of total cheddar cheese production and 0.3% of total cheese production. In 2004, 1,045 carloads of cheese traded, about 1.6% of total cheddar cheese production and 0.5% of total cheese production.

MARKETS: A NEW ERA
While there were concerns over lack of price competition on both the National Cheese Exchange and now the CME, cheese price discovery, volatility and risk management were not a major issue prior to 1990.

The federal dairy price support program established in 1949 provided a relatively high support price under cheese, butter and non-fat dry milk prices, and in turn, the raw milk cost to manufacturing milk plants.

With the government purchasing all surplus products at support levels prices rarely fluctuated. When the market price for dairy products reached support, cheese, butter and powder plants sold product to the CCC. Then when prices increased by 10% or more above support, the CCC sold product back into the commercial market, reducing upside momentum. All told, the quality of the cheese price discovery mechanism was not meaningful.

Since then things have changed dramatically. The support price which was $13.10 per hundredweight in 1981 was reduced to $10.10
by 1990. Suddenly, cheese, butter and, ultimately, farm-gate milk prices were driven by market forces rather than government support levels.

Class III Milk vs CCC "Support"

<table>
<thead>
<tr>
<th>Year</th>
<th>Class III Support</th>
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<tbody>
<tr>
<td>1962</td>
<td>$5</td>
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<tr>
<td>1964</td>
<td>$10</td>
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<td>1966</td>
<td>$15</td>
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<td>1968</td>
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<tr>
<td>1994</td>
<td>$85</td>
</tr>
<tr>
<td>1996</td>
<td>$90</td>
</tr>
</tbody>
</table>

RENEWED IMPORTANCE

In this more market-based environment, price discovery takes on renewed importance.

Absent any immediately obvious alternatives, the National Cheese Exchange and, later, the Chicago Mercantile Exchange remained the forums for cheese price discovery, if only by default.

Today, the vast majority of cheese marketed in the United States moves at a price basis to the market as established during the cash session at the Chicago Mercantile Exchange (CME). Although many variations exist – previous week average, previous month average, date of make, date of ship, etc – all can be traced back to the CME.

Reasons for using the CME price are straightforward. Namely, as long as every cheese manufacturer and marketer uses the CME price as a benchmark, a level playing field exists. No single firm has a disproportionate edge on either the expense or revenue side of the ledger. Manufacturers know that by pricing product against the CME, raw milk costs (represented by the Class III milk price as determined by the CME-influenced NASS survey) are tied to finished good sale prices.

But, with every period of product surplus or deficit, the limitations of the current system come to the fore.²

² Some of these limitations were outlined and detailed in Cheese Pricing: A Study of the National Cheese Exchange by William F. Mueller, Bruce W. Marion, Maqbool H Sial and F.E. Geithman in 1996. From the abstract: “Based on their overall analysis, the authors conclude that the [National Cheese] Exchange was not a reliable or accurate price discovery mechanism during the period 1988-1993. Although the Exchange is dominated by a handful of traders, this is not true for cheese manufacturing, and marketing nationally, as the industry is relatively unconcentrated. Thus, if a cheese pricing market can be developed that reflects the broader national organization, there is potential for far more competitive and accurate price discovery.”
MANY LIMITATIONS

Those limitations are manifold, including:

- **Narrow specifications in a macro-sense.** The price-setting mechanism is reflective of the economic conditions for cheddar cheese but is used as the price driver for almost all cheese sold. The problem is compounded when considering that cheddar’s share of total cheese production has been in decline. In 1980, cheddar accounted for 44% of all cheese production, compared to 17% for Italian varieties. In 1992, cheddar cheese production share slipped to 37%. By 2004, the share had slipped to 31% while mozzarella cheese manufacturing climbed to 33% of the total.

- **Narrow specifications in a micro-sense.** Commodities used in price discovery mechanisms need to be as homogeneous as possible. CME-specified age limits and moisture requirements ultimately limit the availability of Exchange-eligible cheese. That, in turn, reduces market liquidity and, by extension, the quality of price discovery. (The CME specifications essentially match those used for the USDA/CCC support program – emblematic of “old era” thinking.)

- **Few participants.** Most cheese buyers can’t participate in the price discovery mechanism because they have little or no need to own the actual physical product as traded at the CME. Similarly, most cheese sellers cannot participate in the price discovery mechanism because of the CME product specifications differ from those of their commercial customers. Moreover, prospective participants can be hampered by the potential for “political” fallout. Dairy cooperatives, for example, are often loath to move...
excess inventory through the CME for fear of being viewed as depressing prices and farmer income. Trading volume remains low in absolute terms and, particularly, in relative terms when compared to actual US cheddar production.

<table>
<thead>
<tr>
<th>Year</th>
<th>Cars Traded</th>
<th>Traded Volume</th>
<th>Cheddar Production</th>
<th>Volume as % of Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>620</td>
<td>24,800,000</td>
<td>2,819,000,000</td>
<td>0.9%</td>
</tr>
<tr>
<td>2001</td>
<td>484</td>
<td>19,360,000</td>
<td>2,746,691,000</td>
<td>0.7%</td>
</tr>
<tr>
<td>2002</td>
<td>639</td>
<td>25,560,000</td>
<td>2,801,405,000</td>
<td>0.9%</td>
</tr>
<tr>
<td>2003</td>
<td>596</td>
<td>23,840,000</td>
<td>2,749,342,000</td>
<td>0.9%</td>
</tr>
<tr>
<td>2004</td>
<td>806</td>
<td>32,240,000</td>
<td>2,765,169,000</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

- **Potential for manipulation.** Because of limited deliverable supply and a limited pool of ready-willing-able commercial participants, comparatively few traders have significant market power. Consequently, even minor surpluses or shortages of CME-eligible cheddar cheese can have a major impact on prices. When cheddar cheese supplies are tight a single buyer can easily bid up the CME cash cheese price for a several trading sessions without encountering an actual seller. Likewise, when cheddar cheese experiences a minor surplus, a single participant can easily offer to sell cheese at lower prices for several trading sessions without encountering an actual buyer. In this environment, commercial and, increasingly, speculative pricing “agendas” can be conceived and carried out.

- **Anonymity doesn't really exist.** Market participants typically use the same floor brokers day after day. Because the identity of the ultimate buyer and seller are ultimately disclosed in the delivery process, most participants know who is doing what at any given time.

- **Price movement without trade consummation.** CME rules (and, previously, NCE rules) allow for the settlement price to change based on one of three conditions:
  - An actual sale of cheese at a price higher or lower than the previous session’s price.
  - An uncovered offer to sell cheese at a price lower than the previous session’s price.
  - An unfilled bid to buy cheese at a price higher than the previous session’s price.

Because activity is sparse, prices frequently change on bids or offers, not trades. In fact, that phenomenon has only grown. In 2000, 30% of settlement price changes occurred on no volume. By 2004, that number had grown to 49%.
CLASS III FUTURES: A VIABLE ALTERNATIVE

Liquidity... Relevance... Accessibility... Transparency...
Anonymity... Accountability... These critical dimensions to a successful price discovery vehicle may be in only modest supply in the CME cash cheese market. They are, however, already featured – abundant, even -- in the CME Class III Milk futures market.

Accordingly, could the Class III futures market as the discovery arena for cheese prices?

The industry could use the CME Class III second nearby futures price to establish a cheese price. In other words, take the second nearby futures price, add a make allowance and divide by the appropriate yield. For example, using a $1.50/cwt make and a 10 yield, a $13.50/cwt futures price would be equal to $1.50/lb cheese ($13.50 + $1.50 ÷ 10 = $1.50).

A futures-based system can be used in existing pricing systems by averaging each day’s close for a week or a month or a quarter the same way it is done today. And, this methodology is consistent with the federal order pricing system. Indeed, it will not affect the NASS survey system for calculating the Class III price, and it will keep the sales price of the finished goods (cheese) tied to the cost of the raw material (milk) just like today’s CME cash market based system.

BENEFITS

We view a host of potential benefits emanating from a Class III milk futures-based price discovery system, including:

- **True anonymity.** It would be much more difficult to figure “who is doing what” in the marketplace – particularly if participants use multiple brokers to execute transactions. Moreover, because no
product is actually changing hands, identities would not be revealed through the delivery process (via shipping instructions, manifests, etc). The promise of true anonymity would ostensibly free firms to participate in the process without as much concern for “political” issues.

- **More difficult to manipulate.** Effecting price change will require real-time dollars. At times today, buyers can bid prices up (or sellers offer prices lower) without much fear that they will actually have to pay for or deliver product.

- **Broader participation.** All cheese buyers and sellers could participate in the price setting mechanism, not just cheddar cheese buyers and sellers. The greater number of buyers and sellers participating in the price discovery mechanism will reflect a much greater competitive market and a much truer picture of the national supply and demand for milk, cheese, and other dairy products, thereby adding integrity to the system.

- **Liquidity.** Class III futures market liquidity has made significant strides over the past five years. Consider: in 2000, average daily trading volume equaled 183 contracts; in 2004, that number soared to 1,372. Total futures trading volume in 2004 equaled 68.8 billion pounds. That’s roughly equal to 40% of US milk production and 125% of Class III milk utilization. It is also worth noting that liquidity begets liquidity. If the futures market becomes the price discovery mechanism, participation would likely only increase, providing even more liquidity, which tends to invite more participation, etc. Finally, more liquidity should translate to less short-term volatility.

- **Works in the FMMO system.** A Class III futures-based price discovery system is compatible with the Federal Milk Marketing
Order system. Nothing need change. Instead of the CME cash price influencing NASS survey values, cheese-adjusted Class III futures prices would influence the surveys. Adjustments for butterfat and whey can be made just as they are today. Multiple component pricing would work not be affected in any way. (California’s formula for pricing 4b milk would, however, need modification as it currently employs the CME cash market (not the NASS survey) as its base. The formula could be modified to price cheese as some derivative of the prevailing futures price.)

- **Better regulatory oversight.** Class III futures are regulated by the Commodity Futures Trading Commission (CFTC).
- **Time-tested model.** Other commodities have successfully used a futures based pricing model for decades, including corn, soybeans, wheat crude oil, natural gas, unleaded gasoline, coffee, sugar, cocoa, gold and silver.
- **Convergence is assured.** The Class III cash settled futures market meets the homogeneity test. Since the Class III price is determined by a monthly average of the NASS Survey of the weighted average of actual cheddar cheese sales, the absence of a delivery mechanism to guarantee cash futures price convergence is not necessary.
- **Potentially reduces frequency of negative PPDs.** Negative PDDs are caused by the advanced pricing of Class I milk in times when cheese prices are moving aggressively higher. The Class I price turns out to be less than the Class III price for a given month, creating a negative differential that only grows as plants opt out of FMMO pools. Using the Class III price as the discovery vehicle for cheese will reduce these sharp run ups as well as sharp declines and smooth out changes. Indeed, one objective of federal milk marketing orders is to provide for price stability. Since cheese prices are the primary driver of the Class III price and most of the time the mover of the Class I price, federal order prices ought to be more stable benefiting dairy producers, milk handlers and consumers.

**CONCLUSION**

Debates about cheese price discovery have persisted for decades. While the journey from Green Bay to Chicago has brought modest improvements, the system remains lacking in critical areas such as liquidity, immediacy and anonymity. A better vehicle, however, may already exist: the Class III milk futures market. By using Class III futures to establish day-to-day cheese pricing, the dairy industry would at once address many of the current cash markets shortcomings. Most agricultural commodity pricing in the US (indeed, the world) is tied to underlying futures markets. We believe the dairy industry has an opportunity to join those ranks.