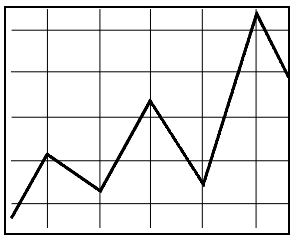
MARKETING AND POLICY BRIEFING PAPER



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Order Reform and Reforming Order Reform

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Changes in federal milk marketing orders were mandated by the 1996 Farm Bill, which gave USDA two years from the date of passage to consolidate orders and revise pricing rules. In subsequent legislation, Congress authorized delays in implementation and stipulated the specific structure of Class I differentials. The amended orders became effective on January 1, 2000.

As part of the Consolidated Appropriations Act of 2000, Congress further mandated that the Class III and Class IV pricing formulas included in the new orders be reconsidered. A hearing was held in May 2000 to hear testimony on several changes proposed by industry participants. USDA issued a tentative decision on related amendments on December 1, 2000. Assuming producers vote in favor of the tentative rule, the amendments will become effective January 1, 2001.[2]

The industry has until February 5, 2001 to provide comments. These comments will be reviewed and USDA will then issue a final decision to amend the orders. Favorable approval by producers is required to implement the final amendments. If producers vote against the amendments, then not only do the amendments fail, but the entire order is

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[2] In the normal course of federal milk marketing order amendments, USDA issues a preliminary decision, provides a comment period, and then issues a revised final decision based on comments received. The final decision is then offered for a producer referendum. The normal process was suspended because Congress mandated specific deadlines for a final decision and implementation of the amended orders.

terminated. Producers vote only in the order they are associated with. It is possible that producers approve the amendments for some but not all of the orders. In that case some orders would be terminated and others would operate as amended.

In this paper, we first outline the major changes in federal order pricing that were implemented on January 1, 2000. We then provide an assessment of the effects of order reform. Finally, we review and evaluate the changes in Class III and Class IV pricing proposed under the amended orders.

Principal Elements of Reform[3]

The major changes embodied in the original amended orders (January 1, 2000) were:

- *A reduction in the number of orders*. Congress required consolidation of orders to no more than 14 and no fewer than 10. USDA realigned the 31 previous orders into 11 new ones. California producers were invited to petition for a separate federal order regulating handlers in the state, but elected to retain their separate state pricing system.

- *Replacement of the Basic Formula Price*. Introduced as the minimum price for Class III milk and the mover of Class I and Class II prices in mid-1995, the Basic Formula Price (BFP) relied on a monthly survey of Grade B milk plants in Minnesota and Wisconsin to establish a base price, which was adjusted for changes in wholesale prices for butter, cheese, and nonfat dry milk. The limited supply of Grade B milk raised serious questions about the reliability of the BFP in reflecting the true value of milk used for manufacturing.

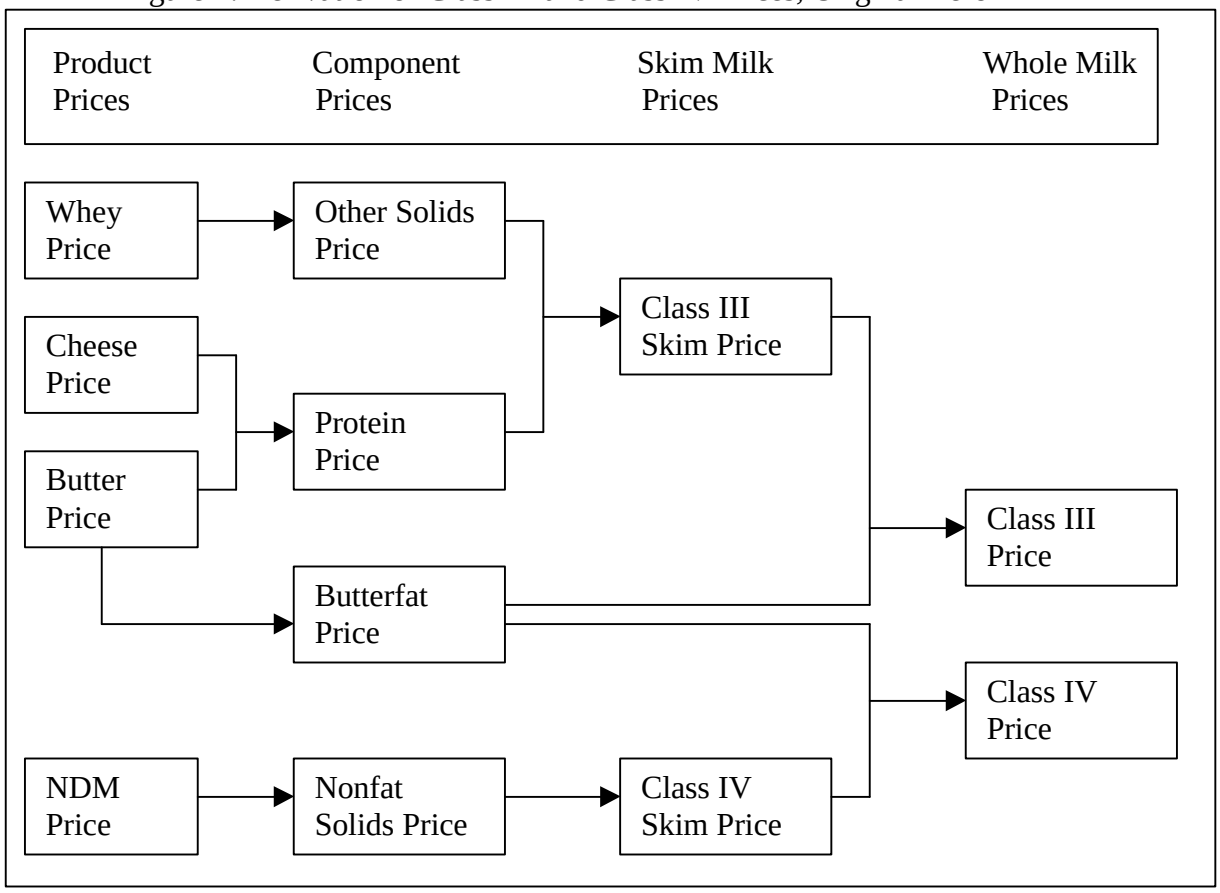
  To replace the BFP, USDA adopted a system of product price formulas. The process for deriving Class III and Class IV prices is illustrated in Figure 1. The system is grounded in computed prices for four milk components – butterfat, protein[4], other solids, and nonfat milk solids. The component prices are derived from product prices using assumed yields of product per unit of milk component and manufacturing costs (make allowances). The butterfat price is set in reference to butter prices. The protein price is tied to prices for both cheddar cheese and butter. The other solids price is linked to the price of dry whey. And the nonfat solids price uses nonfat dry milk as the reference product.

[3] For an expanded discussion of order freeform, see Tom Cox and Bob Cropp, *Federal Order Reform: The Final Rule*, Marketing and Policy Briefing Paper No. 68, April 1999.

[4] The amended orders change the way in which protein is measured. Protein is now "true" protein, which does not include non-protein nitrogen. For details on the nature and effect of this change, see Bob Cropp, Randy Shaver, and Bill Wendorff, *Changes in Testing and Paying for Milk Components as Proposed under the Final Rule of Federal Order Reform: Implications for Dairy Producers*, Marketing and Policy Briefing Paper No. 70, July 1999.

These component prices are the building blocks for the Class III and Class IV prices using an assumed standard composition of raw milk.[5] The Class III skim milk price per hundredweight is the combined value of 3.1 pounds of protein and 5.9 pounds of other solids. The Class IV skim milk value is the value of 9.0 pounds of nonfat solids. Whole milk prices for Class III and IV are the sum of skim milk prices times 96.5 percent (0.965) plus the value of 3.5 pounds of butterfat from the butterfat equation.

Figure 1: Derivation of Class III and Class IV Prices, Original Reform



The Class III price is the federal order minimum price for milk used to make hard cheese. The Class IV price – a new price classification replacing the previous Class IIIa – is the minimum order price for milk used to make nonfat dry milk.

The Class III and IV prices and their constituent component prices are announced on the first Friday on or before the 5th of the month after the month to which they apply.

[5] Standard composition is 3.5 pounds butterfat and 96.5 pounds of skim milk, with the skim milk portion consisting of 3.1 percent true protein, 5.9 percent other milk solids, and 91 percent water.

They are computed from weighted average product prices for the four or five weeks with Fridays preceding the announcement date.

- *A new price mover for Class I and Class II milk and advanced pricing*. Prior to order reform, the BFP was the Class I price "mover." Class I differentials varying by market were added to the BFP from two months earlier to establish minimum Class I prices. The BFP was also used to set Class II prices.

  The new orders use a "higher of" formula for setting Class I prices. Class I prices for a given month are announced on the Friday prior to the 23rd of the previous month. They are derived from *advanced* skim milk values for Class III and Class IV, calculated on the Friday of the month preceding the 23rd. The advanced Class III and IV prices are computed in the same way as the Class III and IV prices, but the formulas use the weighted average butter, cheese, whey, and nonfat dry milk prices from the two full calendar weeks preceding the 23rd.

  Whichever skim milk value is higher becomes the base skim milk price for Class I. The market-specific Class I skim milk price is the base skim milk price plus the applicable Class I differential. The Class I whole milk price is the market-specific Class I skim milk price times .965 (the proportion of whole milk consisting of skim milk) plus 3.5 times the advanced Class I butterfat price (the advanced Class III/IV butterfat price plus the Class I differential divided by 100).

  The Class II skim milk price is also advance priced, and is equal to the advance Class IV skim milk price plus $.70 per hundredweight. Accordingly, Class II handlers know their skim milk price obligation before the fact. But the Class II butterfat price is the Class III/IV butterfat price plus $.007 per pound. So Class II handlers do not know their butterfat price obligation until after the fact.

Effects of Reform

Some of the federal order amendments have had little or no impact on milk prices or other measures of market performance. With a few exceptions, the class utilizations for geographical areas changed little and therefore consolidation had only a minor impact on producer prices. Order consolidation has probably increased efficiency by more closely aligning federal order marketing areas with the actual distribution areas of fluid milk handlers. There are fewer distortions attributable to artificial islands of competition created by order regulation. But given the recent flurry of mergers and acquisitions among fluid milk processors (especially Dean Foods and Suiza), it is questionable whether as many as 11 orders are really necessary to define genuinely separate marketing areas. It would seem economically sensible to systematically reduce the number of orders as fluid milk distribution areas expand and intertwine.

Replacing the BFP was not really an option given the absence of a reliable Grade B milk value indicator. While we believe that a competitive Grade A manufacturing pay price

better captures ***milk*** supply and demand conditions, the use of product price formulas to establish milk values makes some economic sense. At least on the surface, it seems reasonable to use product prices to derive milk component values, since that suggests a derivation of component demand from final product demand.

However, the specific nature of the product price formulas has created serious problems in transmitting appropriate price signals to dairy producers.

The most serious problem is with the protein price formula, which attempts to net out the value of butterfat in butter from the value of butterfat in cheese. The protein price formula is:

Protein Price/Lb. = (NASS Cheese Price – 0.1702) * 1.405

\+ (((NASS Cheese Price – 0.1702) * 1.582) – BF Price) * 1.28

The first line of this equation is simply the net (of manufacturing costs) value of a pound of protein in cheddar cheese based on standard cheese yield relationships – a pound of protein yields 1.405 pounds of cheese. The second line represents the net value of a pound of butterfat in cheddar cheese less the value of butterfat in butter.

The problem with the equation is in the negative relationship between the protein price and the butterfat price, which is derived from a product price formula relating the butterfat price to the price of Grade AA butter. A one-cent per pound increase in the butter price ***raises*** the butterfat price by 1.22 cents per pound and thereby ***reduces*** the protein price by 1.56 cents per pound (1.22 * 1.28). Because of the magnitude of this effect, butter price increases reduce the Class III price. Even though higher butterfat values raise the butterfat part of the Class III price, this increase is more than offset by the lower protein value.

This method of pricing protein has proven to create serious problems when cheese prices are very low relative to butter prices. In November 2000, the Monthly average NASS cheese price used in the federal order pricing formula for protein was $1.0245 per pound and the NASS butter price was $1.4051 per pound. This yielded a Class III skim price of $3.17 per hundredweight and a Class III whole milk price of $8.57.

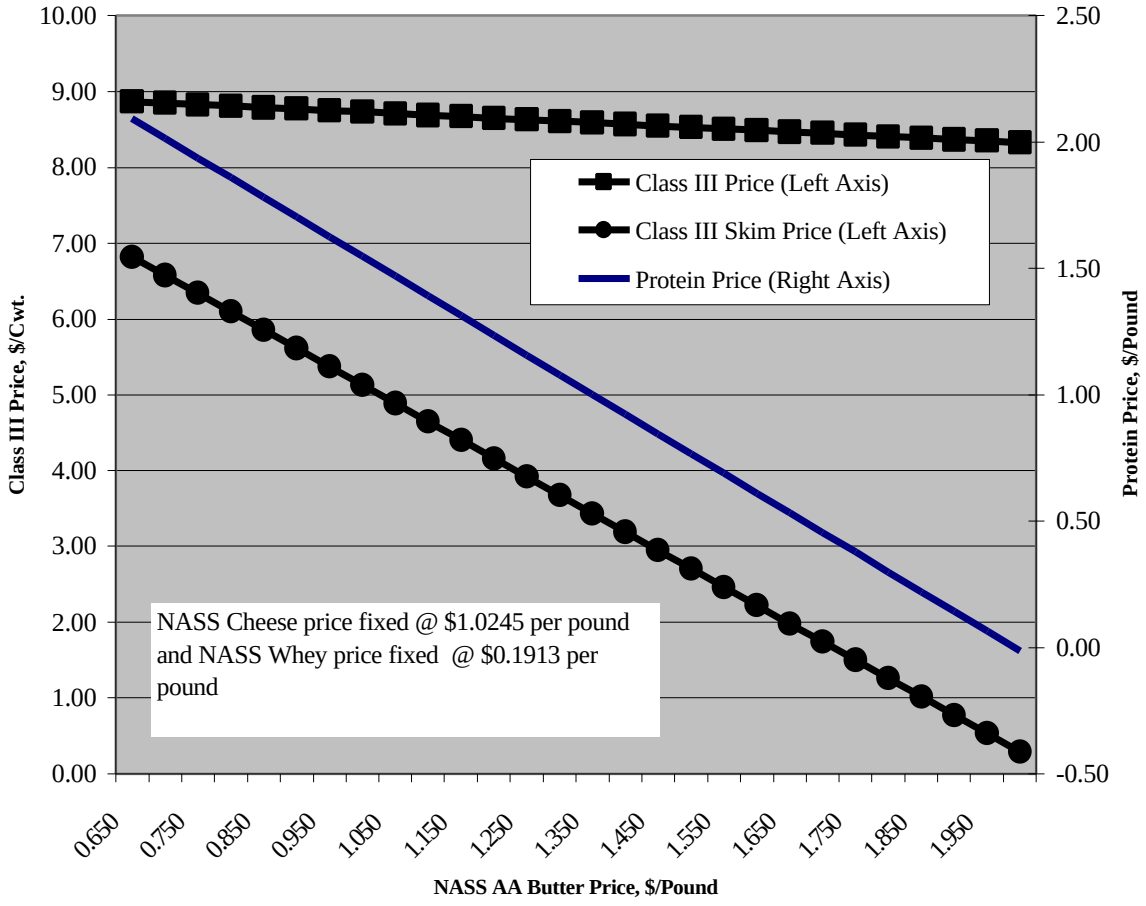
The more general relationship between butter prices and Class III milk values is shown in Figure 2. As of early December, the CME butter price was more than $1.85 per pound. Figure 2 shows that, with the average monthly November cheese and whey prices, the related Class III skim milk price is about $1.00 and the protein price is less than 25 cents per pound.

It seems extremely unlikely that these anomalous price effects were anticipated when the protein formula was adopted. The price signals generated by relatively high butter prices make absolutely no sense. Relatively high protein composition in milk improves the cheese yield and efficiency of cheese making. Relatively low protein composition in

relation to butterfat composition often requires the addition of solids-not-fat to farm level milk in order to capture the higher value of butterfat in cheese relative to whey. The pricing system should provide dairy producers the incentive to feed and breed for higher protein composition milk used in cheese making. But high butter prices depress the price per pound of protein paid to dairy producers even though the price of cheese is unchanged.

This "butter problem" is exacerbated by the reform decision to use the higher of advance Class III or Class IV skim prices as the mover of the Class I milk price. The Class IV skim milk price is insensitive to the price of butter – it is driven entirely by the value of nonfat dry milk through the nonfat solids product price formula. But because of the negative effect of the butterfat price in the protein formula, the Class III skim milk price is strongly influenced by butter prices (see Figure 2).

Figure 2: Protein and Class III Milk Prices as Related to Butter Price
November 2000 NASS Cheese and Whey Prices



NASS-reported nonfat dry milk prices have been stagnant at just above the CCC support price since adoption of the pricing formulas. This has resulted in advance Class IV skim

milk prices in a narrow range of $7.70 to $7.76 per hundredweight. But because of high butter prices relative to cheese prices, The Class III skim milk price has been consistently lower than the Class IV skim milk price. The gap reached $3.61 for December 2000, and could exceed $5.00 for January 2001.

With the Class IV skim milk price as the mover of Class I milk prices every month during 2000, the Class I price has exceeded the Class III price by the applicable Class I differential plus an additional amount averaging $1.76 per hundredweight for the year. In effect, order reform has increased the Class I differential by $1.76.

These higher effective Class I differentials have created conflicting market signals to dairy farmers. Few would dispute the fact that the U.S. dairy industry is in the midst of a serous supply-demand imbalance. Those producers in markets like the Upper Midwest with high Class III use are feeling the full brunt of the current national milk surplus. Those in markets with high Class I use are being isolated from low prices by extraordinary Class I prices.

Use of the higher of mover was intended to give a temporary "bump" to Class I prices when nonfat dry milk was in relatively tight supply compared to cheese. Nonfat dry milk prices have not been above support since February 1999. Cheese prices are currently below support, but have been above most of 2000. Consequently, it is curious as to why nonfat dry milk, a product using only a small portion of the U.S. milk supply and a product moving in vast quantities to CCC warehouses, should determine the price of milk used for fluid purposes.

We can only speculate as to why butter prices in 2000 have remained very firm relative to cheese prices in the face of a substantial milk surplus. It is possible that there is insufficient butter manufacturing capacity to allow much milk to shift from cheese to butter in response to favorable butter prices. It is possible that recent additions to cheese manufacturing capacity has encouraged milk to stay with cheese in order to keep cheese plants operating efficiently. It is possible that low nonfat dry milk prices continue to encourage cheese milk standardization via the addition of solids rather than the skimming of fat.

Firms with both butter and fluid milk operations clearly have an interest in high butter prices to ensure that the Class IV price would move the Class I price in periods of relatively low cheese prices. With low cheese prices and nonfat dry milk prices supported above a market clearing level, increased butter prices ensures Class IV skim milk as the Class I mover. Using the higher of the advanced Class IV or Class III skim milk price has de-coupled the Class I and Class II segments of the dairy industry from the cheese market. Dairy producers in the high Class I markets have been partially isolated from milk surpluses and low cheese prices. The burden of milk surpluses have fallen on the predominately Class III use markets. Thus, producers in all regions of the country are not receiving the same price signal from the marketplace to reduce milk production. This has delayed or slowed necessary milk supply adjustments and has prolonged the period of low milk prices.

Reforming Reform

The December 1, 2000, Tentative Decision makes several minor and one major change to the product pricing formulas used for Class III and Class IV milk. The minor changes involve (1) small alterations in the make allowances for all of the product price formulas, (2) an increase in the assumed yield of nonfat dry milk in the nonfat solids formula, and (3) an increase in the price of barrel cheese in the formulas involving the cheese price. The major change is adoption of a cheese-based Class III butterfat price formula separate from the butter-based Class IV butterfat price formula and a related change in the protein price formula..

The make allowance changes are as follows:

- The cheese make allowance was decreased from 17.02 cents per pound to 16.5 cents per pound.

- The butter make allowance was increased from 11.4 cents per pound to 11.5 cents per pound

- The nonfat dry milk and dry whey make allowances were increased from 13.7 cents per pound to 14 cents per pound.

These altered make allowances will have a minor effect on the related component prices. The butterfat price will be about $0.00122 per pound lower and the other solids price will be about $0.0031 per pound lower. The other formulas are affected by other changes (see below).

The yield change in the formula for nonfat milk solids assumes a pound-for-pound correspondence between nonfat milk solids and nonfat dry milk. Previously, there was a small downward adjustment to account for buttermilk powder that is produced in the manufacturing of nonfat dry milk. Combining the higher make allowance and the higher yield, the net effect is a nonfat solids price about $0.015 per pound higher.

The original protein formula used a weighted average of 40-pound block and 500-pound barrel cheddar cheese prices (weights equal to factory production of the two types of cheese). The barrel cheese price was adjusted to a moisture content of 39 percent, and 3 cents per pound was added to account for lower manufacturing costs for barrel cheese relative to block. The amended order changes the standardized moisture level to 38 percent. By itself, this would raise the protein price slightly, about a nickel per pound. But this effect is confounded by other changes in the protein formula.

The major change offered by the tentative final decision relates to calculation of the Class III price. We earlier were critical of the negative effect of butter prices on the protein

price and, consequently, the Class III skim and whole milk price. The amended order eliminates the butter price in formulas deriving the Class III prices.

A new Class III butterfat price is defined in terms of the value of butterfat in making cheese. The specific formula is:

Class III Butterfat = (NASS Cheese Price – 0.165) * 1.582

The new formula uses standard cheddar cheese make equations indicating that a pound of butterfat will yield 1.582 pounds of cheese. This is the same yield relationship for butterfat that was assumed in the old protein equation, except that the relationship is "separated out" into a butterfat product price formula.

The new protein equation is modified to account for the separate cheese-based butterfat formula:

Protein = (NASS Cheese Price – 0.165) * 1.405

This is the first term of the old protein equation (see above), and indicates that a pound of (true) protein will yield 1.405 pounds of cheddar cheese at 38 percent moisture.

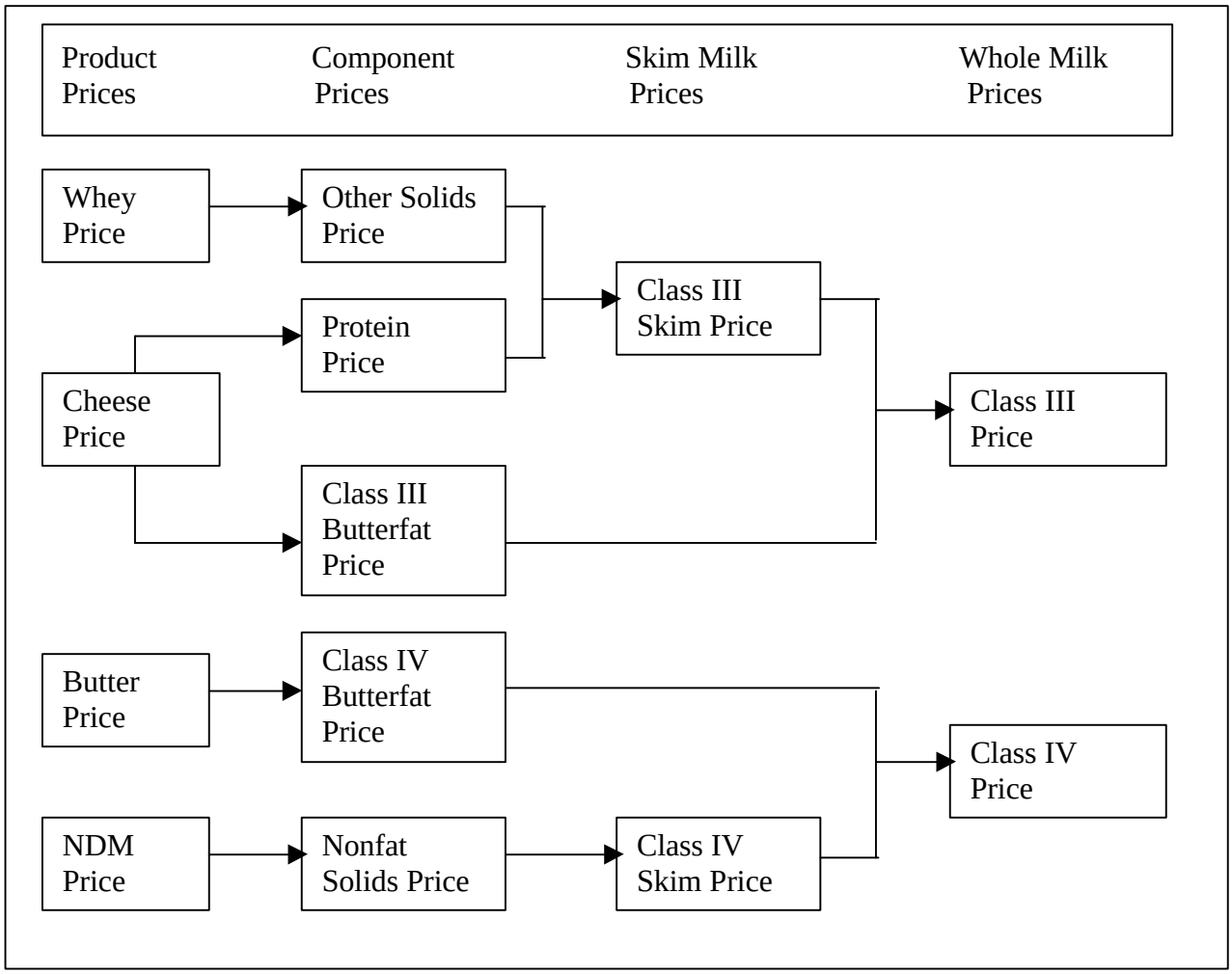
The separation of Class III and Class IV butterfat values changes the derivation process for Class III and Class IV milk prices as noted in Figure 3 (compare with Figure 1).

The new Class III formulas for butterfat and protein de-couple the Class III price from butter prices, which eliminates the problem of high butter prices driving down the Class III price. But this improvement is accomplished at a considerable cost. That cost is in a general lowering of the Class III skim milk price, which will ensure that the Class IV skim milk price will serve exclusively as the Class I price mover.

The relationship between the Class III and IV skim prices under the new formulas is shown in Figure 4. With nonfat dry milk trading at support and whey at 20 cents per pound (current levels for both prices), the cheese price would have to exceed $1.88 per pound for Class III to be the mover of Class I. This would not appear to be likely, at least for extended periods of time.

The advanced Class III and Class IV skim milk prices that would have been generated by the new formulas in 2000 are shown in figure 5. In 2000, the new advanced Class IV skim milk price would have exceeded the new advanced Class III skim milk price by an average of $3.27 per hundredweight. The actual annual average difference using the old formulas was $1.76 per hundredweight.

Figure 3: Derivation of Class III and Class IV Prices, Tentative Final Decision

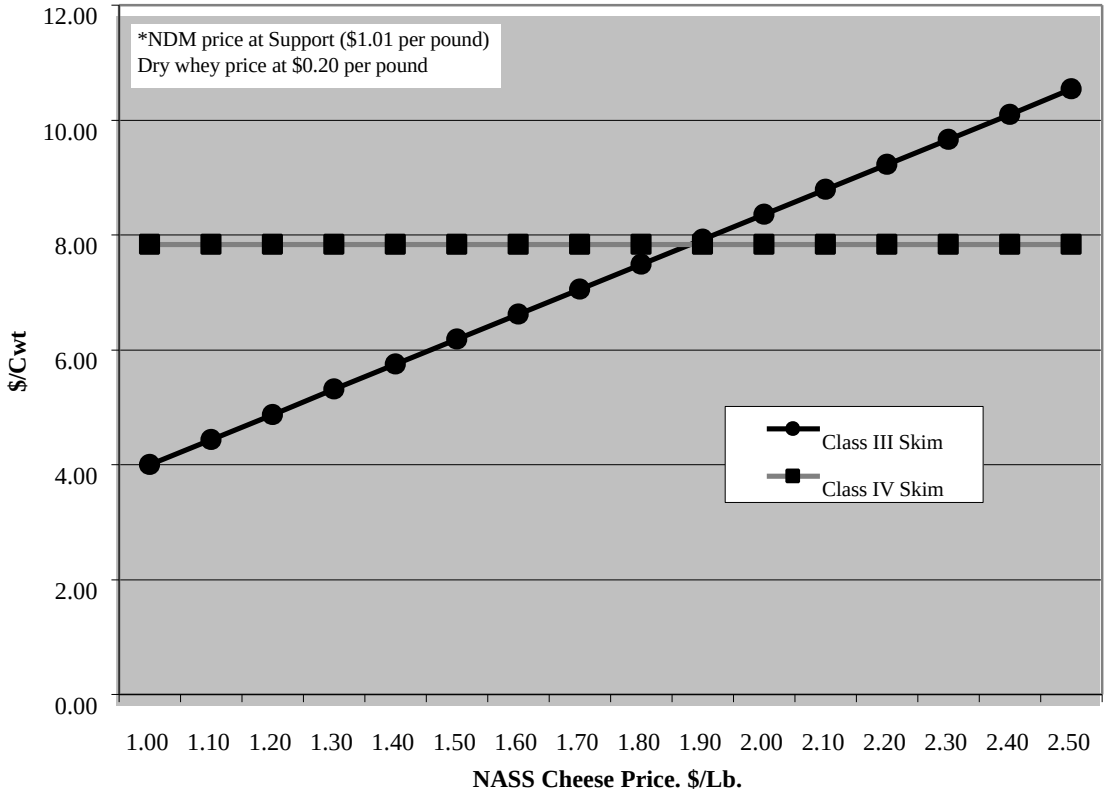


The reduction in the Class III skim milk price effectively establishes Class IV as the Class I mover, cementing an associated increase in the Class I differential measured as the difference between the Class I price and the Class III price. The Class III price is for milk used to make cheese. Cheese is now the primary market outlet for milk, and the only dairy product that has consistently shown increases in demand in recent years. Consequently, it is hard to comprehend the reasoning behind completely de-coupling fluid milk prices from the price of cheese.

Because the tentative final decision derives the Class III butterfat price from the NASS cheese price, the Class III butterfat price will differ from the butterfat prices for other classes of milk. Under current provisions, the butterfat price paid to dairy producers is the Class III butterfat price. Under the tentative final decision, a blend butterfat price will be paid to producers. The blend butterfat price will vary by order, depending on the butterfat price for each class and the utilization of milk by class.

The Tentative Final Decision summarily dismissed using a weighted average Class III/Class IV price to move the Class I price. We think this was a serious mistake. From the 1960s through 1995 the Minnesota and Wisconsin Price (MW) was used as the mover of the Class I price. In 1995, the MW was replaced with the Basic Formula Price (BFP). Both the MW and the BFP were a weighted average of the value of milk used to make butter, milk powder and cheese. A close relationship between Class I prices and Class III prices were maintained. It also assured that federal order pricing provisions were in harmony with the federal dairy price support program, which supports farm level milk prices via CCC purchases of butter, nonfat milk and cheese. But with the higher of the advanced Class IV or Class III price as the mover, both the relationship between the Class I price and the milk used for cheese and the harmony with the support program have been lost. In periods of milk surpluses, cheese and nonfat dry milk prices may be near support but butter prices could be above support and increasing. In that case, milk prices to dairy producers in fluid markets would increase while prices to dairy producers in Class III markets could decreases; a situation experienced during the last quarter of 2000. Neither federal milk marketing orders nor the federal price support program function rationally under these pricing provisions.

Figure 4: Class III and IV Skim Values at Varying Cheese Prices
Tentative Final Decision*



Summary Observations:

The current provisions of federal order reform have created regional inequities in milk pricing. The use of an advanced Class IV or advanced Class III skim milk price as the mover of Class I and Class II prices has de-coupled these prices from Class III prices when cheese prices are relatively low and butter prices are above support. While dairy producers in fluid markets experience more stable or higher prices, dairy producers in manufacturing markets may experience lower or declining prices. Further, under current provisions there is a real interest on the part of fluid processors and producers in fluid markets to see higher butter prices. But while higher butter prices increase Class IV price they decrease the protein price per pound paid to producers, the Class III mover and the monthly Class III price.

The tentative final decision de-couples the protein price from butter prices. This depresses the Class III skim milk value even further, assuring that the Class IV skim milk price will be the mover of Class I milk prices. In turn, this increases the effective differential between Class III and Class I, and thereby enhances the regional disparities in producer milk prices. This widening of the effective differential encourages pooling of milk from the low Class I utilization markets to the high Class I utilization markets. This is hardly rational milk pricing. Not until a change is made in the Class I mover will these regional price disparities and pooling issues be resolved.

The tentative final decision falls far short of correcting the deficiencies of federal order pricing provisions, and, in fact, enhances potential discrepancies in regional milk prices.

Figure 5: Advanced Class III and IV Skim Milk Prices, 2000
Tentative Final Decision Formulas