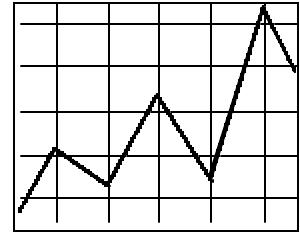


MARKETING AND POLICY BRIEFING PAPER



Department of Agricultural and Applied Economics, College of Agricultural and Life Sciences, University of Wisconsin-Madison
Cooperative Extension, University of Wisconsin-Extension

Paper No. 79
November 2002

Federal Milk Marketing Order Reform: November 2002 Final Decision on Class III/IV Formulas

Ed Jesse, Brian Gould and Bob Cropp¹

Background

The process of federal milk marketing order reform mandated by the Federal Agriculture Improvement and Reform Act of 1996 evolved further with the publication of another final decision in the November 7, 2002, *Federal Register*. The most recent decision slightly modifies a related recommended decision dating to October 2001. The October 2001 proposed rule was in response to a court-ordered injunction of certain provisions implemented in a tentative final rule issued December 2000. Since January 2001, orders have operated using a hybrid of formulas from the December 2000 and earlier decisions.

The October 2001 recommended decision, upon which the November 2002 final decision is based, was discussed in *Marketing and Policy Briefing Paper No. 73*. To review, the principal changes proposed last year were:

- Increasing the make allowance in the Class III Other Solids formula.
- Eliminating the “snubber” (lower bound of zero) on the Class III other solids
- Changing the yield formula in the Class IV nonfat solids formula.

¹ Jesse and Cropp are Professors and Dairy Marketing Specialists, Department of Agricultural and Applied Economics, University of Wisconsin-Madison/Extension. Gould is a Senior Scientist with the Center for Dairy Research, University of Wisconsin-Madison

- Altering the Class III protein formula to prevent Class III prices from being negatively affected by butter prices.

The November 2002 final decision confirms these proposed changes and adopts further minor changes based on industry comments received in response to the recommended decision. Most of the new changes adjust yield factors to reflect milk and butterfat losses experienced between farm and milk plant.

New Class IV and Class III Formulas

The specific formulas for Class III and Class IV milk within the final decision are outlined below, with notations indicating changes between the recommended and final decisions (values in bold italics also identify formula changes). These formulas will become effective upon a favorable vote on the entire final decision in a producer referendum to be conducted shortly. Since most producers are represented by dairy cooperatives that bloc vote their membership, a positive vote is practically a certainty.

Class IV formulas:

Class IV (and Class III) butterfat price (\$/lb.) = (NASS AA butter price - \$0.115)****1.20***

- The butter yield per pound of butterfat was altered to reflect farm-to-plant milk losses of 0.25 percent of total milk volume and additional butterfat losses of 0.015 pounds per pound of butterfat. The revised yield factor reconfirms the assumption that one pound of butter contains 0.82 pounds of butterfat. The farm-to-plant losses mean that one pound of butterfat at the farm is reduced to 0.9825 pounds at the plant [1.0 - .0025 lbs. (reflecting the 0.25% loss applicable to all milk components) – 0.015 lbs. (reflecting the added loss for butterfat)]. Dividing 0.9825 by 0.82 gives the yield factor of ***1.20*** pounds of butter per pound of butterfat.

Class IV nonfat solids (\$/lb.) = (NASS nonfat dry milk price - \$0.14)****0.99***

- The yield factor for nonfat dry milk (adjusted for nonfat solids in buttermilk produced jointly with nonfat dry milk) is reduced from 1.0 to 0.99, reflecting farm-to-plant losses and minor changes in assumptions pertaining to recovery of nonfat solids in nonfat dry milk versus dry buttermilk.

Class IV skim milk price (\$/cwt.) = (Class IV nonfat solids price X 9)

Class IV Price (\$/cwt.) = (Class IV skim milk price X 0.965) + (Butterfat price X 3.5)

Class III Formulas:

Class III butterfat price (\$/lb.) = same as Class IV

Class III protein price (\$/lb.) = ((NASS cheese price² - \$0.165)***1.383**) +
(((NASS cheese price - \$0.165)***1.572**) - butterfat price***0.90**)***1.17**)

- Changes were made in the yield factors expressing pounds of cheese per pound of protein and per pound of butterfat. The protein yield factor reduction from 1.405 to **1.383** comes from including farm-to-plant losses in protein (0.25 percent) and from lowering the assumed casein recovery per pound of true protein from 83.25 percent to 82.20 percent. The cheese yield per pound of butterfat is reduced from 1.582 to **1.572** to include farm-to-plant butterfat losses (0.25 percent plus 0.015 pounds per pound of butterfat). The new protein price formula multiplies the butterfat price by **0.90**, the assumed recovery rate for butterfat in cheese, in the portion of the formula that adjusts for the value of fat in cheese relative to its value in butter. This change recognizes that since only 90 percent of butterfat is recovered in cheesemaking, the same percentage should apply to the butterfat price. The **1.17** value represents the fat-to-protein ratio in standard composition producer milk (3.5 percent butterfat and 2.99 percent true protein).

Class III other nonfat solids price (\$/lb.) = (NASS dry whey price – **\$0.159**)***1.03**

- The yield (whey per pound of other solids) is altered to include farm-to-plant losses. The final decision retains the “no snubber” decision from the recommended decision, which means that the other solids price will be negative whenever the reported NASS price for dry whey averages less than 15.9 cents per pound.

Class III skim milk price (\$/cwt.) = (protein price X 3.1) + (other nonfat solids price X 5.9)

Class III price (\$/cwt.) = Class III skim milk price X 0.965) + (butterfat price X 3.5)

² Weighted average of the NASS 500-pound barrel price adjusted to 38 percent moisture plus 3 cents and the NASS 40-pound block price. Prices and weights are reported by NASS weekly. The Dairy Division of USDA’s Agricultural Marketing Service summarizes the weekly prices to obtain monthly averages. Weekly prices can be accessed upon release from the University of Wisconsin, *Understanding Dairy Markets* website: www.aae.wisc.edu/future/nass_cash_dairy_products.htm

The Class IV and Class III price formulas shown above can be rewritten in terms of the constituent National Agricultural Statistical Service (NASS) product prices from which they are derived. This allows a direct translation of changes in product prices to Class IV and III prices.

$$\text{Class IV Price} = 4.20 * \text{NASS AA Butter Price} + 8.60 * \text{NASS Nonfat Dry Milk (NDM) Price} - \$1.69$$

$$\text{Class III Price} = 0.42 * \text{NASS AA Butter Price} + 9.64 * \text{NASS Cheese Price} + 5.86 * \text{NASS Dry Whey Price} - \$2.57$$

These formulations can be interpreted as follows: A 10 cent per pound month-to-month increase in the NASS AA butter price will increase the Class IV price by 42 cents per hundredweight and the Class III price by 4 cents. A gain of 10 cents in the NDM price would add 86 cents to the Class IV price. Ten-cent increases in cheese and whey prices would increase the Class III price by 96 cents and 59 cents, respectively.

There are no changes in the Class II and Class I formulas. Class I skim milk and butterfat and Class II skim milk and nonfat solids will continue to be advance-priced based on two week averages of NASS prices available on the Friday on or before the 23rd of the month before the advance prices apply. The advance Class III and Class IV formulas have the same format as the Class III and Class IV formulas noted above, but use the abbreviated NASS price averages. The Class I mover will continue to be the higher of the advance Class III or Class IV skim price, and the Class II skim milk price will be the advance Class IV skim milk price plus \$0.70 per hundredweight.

Assessment

Federal order milk component and class prices were simulated from January 2001 using the formulas contained in the final decision. A comparison of the simulated prices with actual prices (simulated minus actual) is shown in the following table.

Component and Class Prices: Final Decision Minus Actual*

	Average	Std. Dev.	Min	Max
Advanced Prices:				
Class I Skim Mover	0.0939	0.2603	-0.0800	0.7900
Class II Skim Milk	-0.0735	0.0049	-0.0800	-0.0700
Class II Nonfat Solids	-0.0082	0.0006	-0.0089	-0.0077
Class I Skim	0.0939	0.2603	-0.0800	0.7900
Class I Butterfat	-0.0251	0.0072	-0.0403	-0.0159
Class I at test	0.0013	0.2334	-0.2000	0.6200
Announced Monthly Prices:				
Class II Butterfat	-0.0249	0.0072	-0.0391	-0.0162
Class III Butterfat	-0.0249	0.0072	-0.0391	-0.0162
Class III Protein	0.1385	0.0734	0.0430	0.2755
Class III Other Solids	-0.0199	0.0001	-0.0201	-0.0196
Class III Skim Milk Price	0.3105	0.2254	0.0100	0.7300
Class IV Butterfat	-0.0249	0.0072	-0.0391	-0.0162
Class IV Nonfat Solids Price	-0.0081	0.0005	-0.0088	-0.0076
Class IV Skim Milk Price	-0.0723	0.0061	-0.0800	-0.0600
Class II Price	-0.1581	0.0285	-0.2060	-0.1243
Class III Price	0.2123	0.1927	-0.0400	0.5700
Class IV Price	-0.1555	0.0316	-0.2100	-0.1200

*Period is January 2001-November 2002 for advance prices; January 2001-October 2002 for monthly prices.

Differences are not dramatic. The 1.6 percent lower assumed yield of butter per pound of butterfat lowers all class butterfat prices by about 2.5 cents per pound. One percent lower nonfat dry milk yields translate to nonfat solids prices less than a penny lower, reducing Class IV and Class II skim milk values by just over 7 cents per hundredweight. The combination of lower butterfat and nonfat solids prices drops Class IV and Class II prices by almost 16 cents per hundredweight.

Protein prices averaged almost 14 cents per pound higher with the new formulas. However, other solids prices were 2 cents per pound lower. Since there are 5.9 pounds of other solids per hundredweight of Class III skim milk and only 3.1 pounds of protein, the effect on Class III skim values is less than suggested by the higher protein price. Class III skim milk averaged 31 cents per hundredweight higher. But lower butterfat values in combination with the higher skim milk price increased Class III at test by only 21 cents.

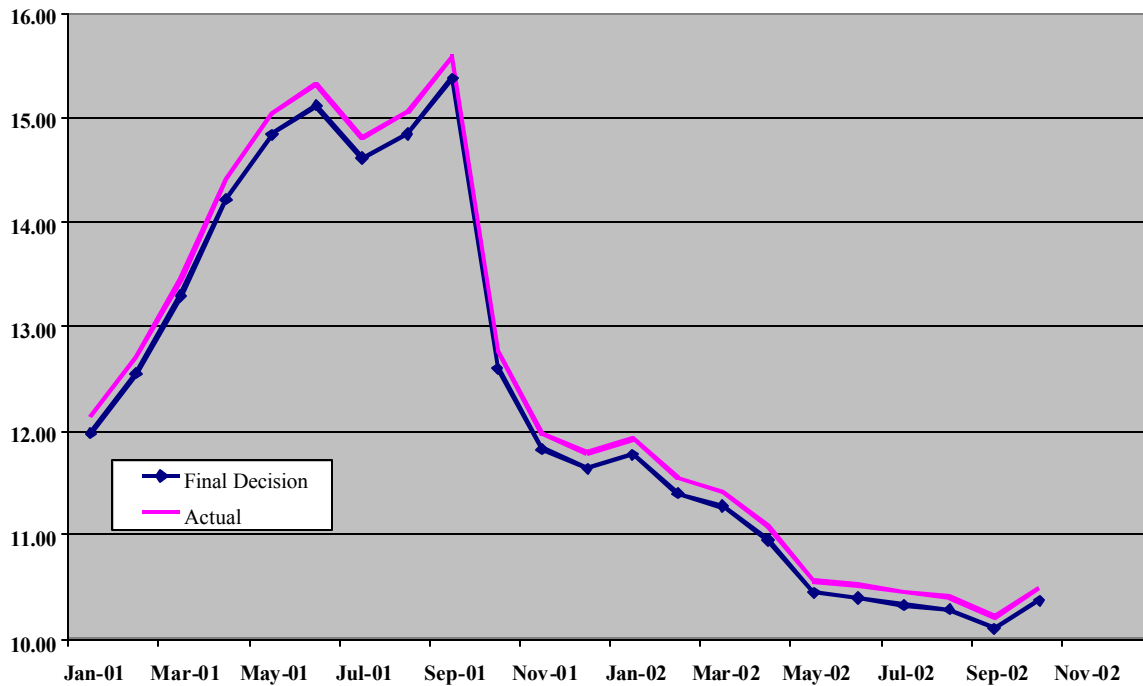
On average, the final decision will have little impact on Class I prices. Because of higher advance Class III skim values and slightly lower advance Class IV skim values, Class III would have been the Class I mover one additional month between January 2001 and

November 2002. Plus higher Class III values when it was the mover elevated the average value of the Class I mover by 9.4 cents per hundredweight. This was almost exactly offset by lower Class I butterfat prices, yielding no change in Class I prices.³

The averages shown in the table mask significant differences from month to month for some component and class prices. The following charts show class price differences (final decision minus actual) by month. The Class IV price is tied to nonfat solids and butterfat prices, for which monthly differences are nearly constant. Hence, the simulated Class IV price closely tracks the actual. Class II price differences have an even smaller standard deviation.

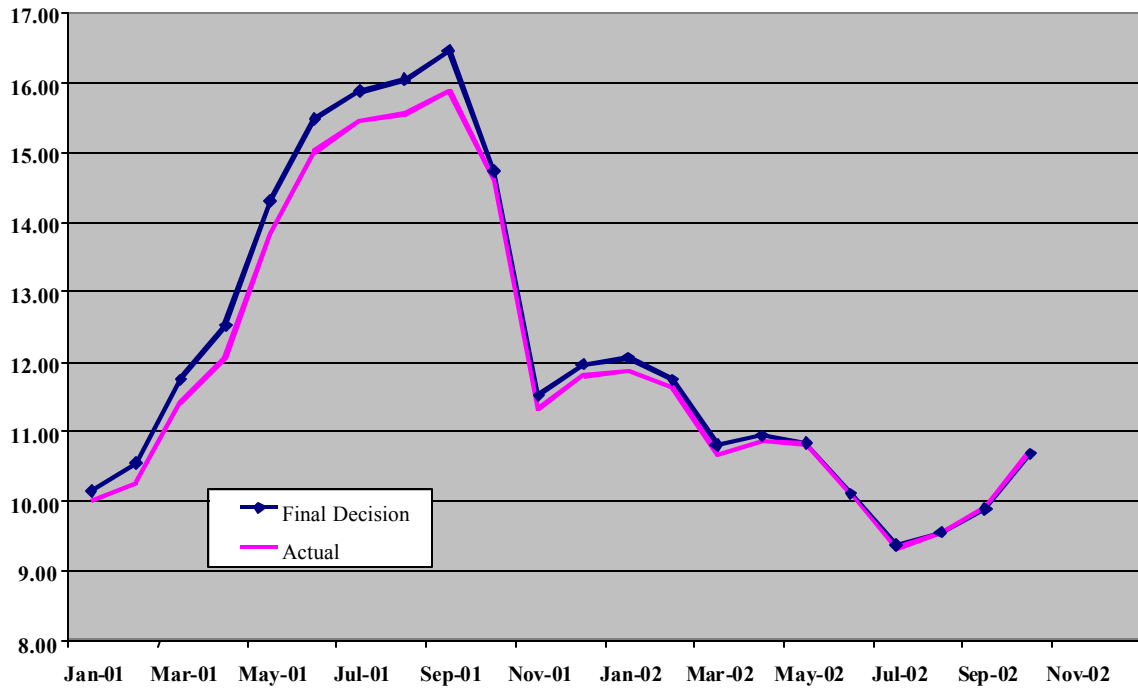
The recommended decision has a larger effect on average Class III prices and month-to-month differences are also larger. The simulated Class III price using the new formulas is as much as 57 cents per hundredweight higher than the actual price. Large positive differences occurred when butter prices were high relative to cheese prices – the new formulas does not discount protein prices for high butter prices as did the old formulas. Class III prices using the new formulas are low relative to the old formulas when whey prices are depressed and butter prices are low. The new formulas generated negative other solids prices in July and August of 2002.

Comparison of Class IV Prices
(January, 2001 – October, 2002)

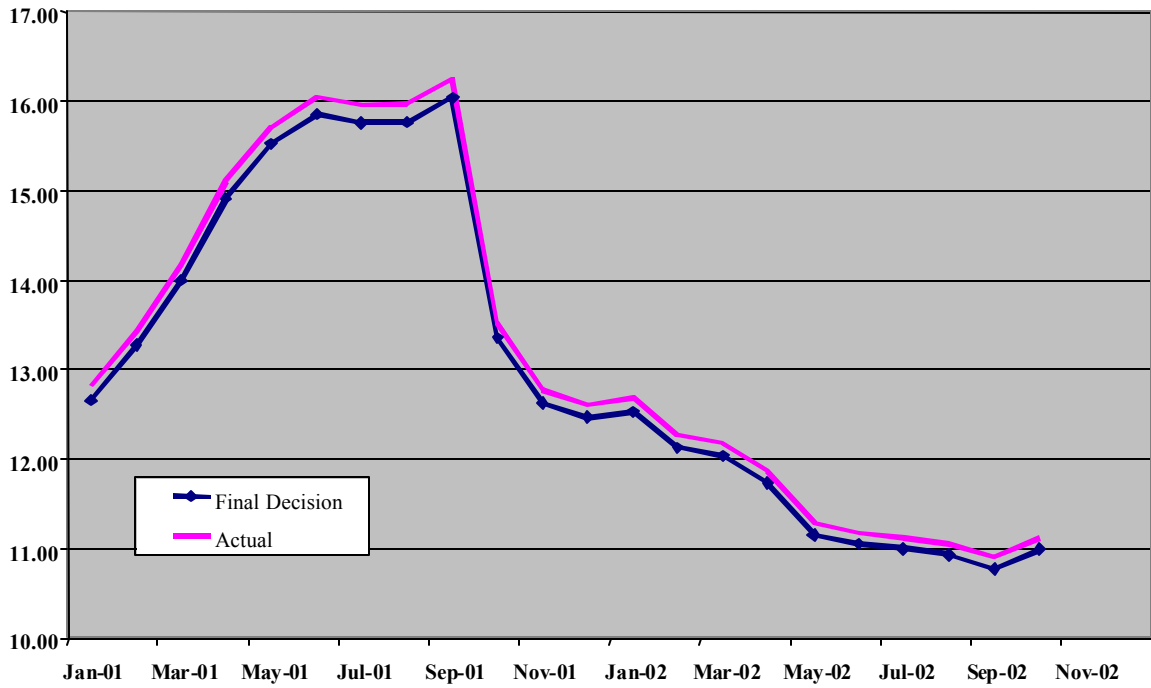


³ Note that the table shows changes in values between the formula values under the final decision and actual values. The level of Class I prices for skim milk and butterfat varies across markets because Class I differentials vary. But since differentials are constant over time, the Class I changes shown apply to all markets

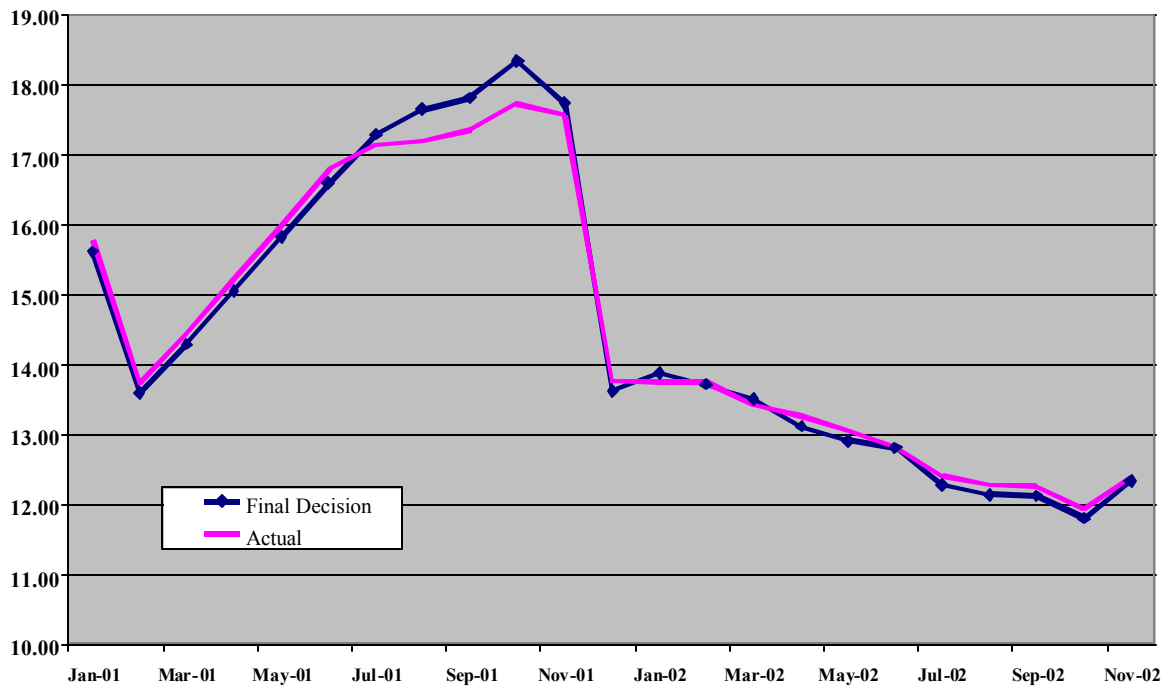
Comparison of Class III Prices (January, 2001 – October, 2002)



Comparison of Class II Prices (January, 2001 – October, 2002)



Comparison of Upper Midwest (Chicago) Class I Prices (January, 2001 – November, 2002)



The Bottom Line

The final decision will raise the Class III price, both in absolute terms and relative to Class IV. This will benefit producers in areas where cheese is important and where plants typically do not pay premiums in excess of federal order minimum prices. The effect on Wisconsin producers will be minimal since plant competition significantly elevates pay prices above order minimums.

Cheese plants in the West opposed the increase in minimum Class III prices. They argued that California’s Class 4b price (for milk used in cheese) is already lower than the federal order Class III price, and that increasing the difference will place them in an even more disadvantageous competitive position.

The final decision eliminates the anomalous negative influence of butter prices on the Class III price. The prior protein price formula resulted in a 10 cent per pound increase in the butter price lowering the Class III price by 4 cents per hundredweight. The revised formula yields a 4.2 cent per hundredweight increase in the Class III price for a 10 cent increase in the butter price.

The new protein price formula makes it somewhat less likely that the advanced Class IV price will consistently serve as the mover of Class I prices. However, Class III would have been

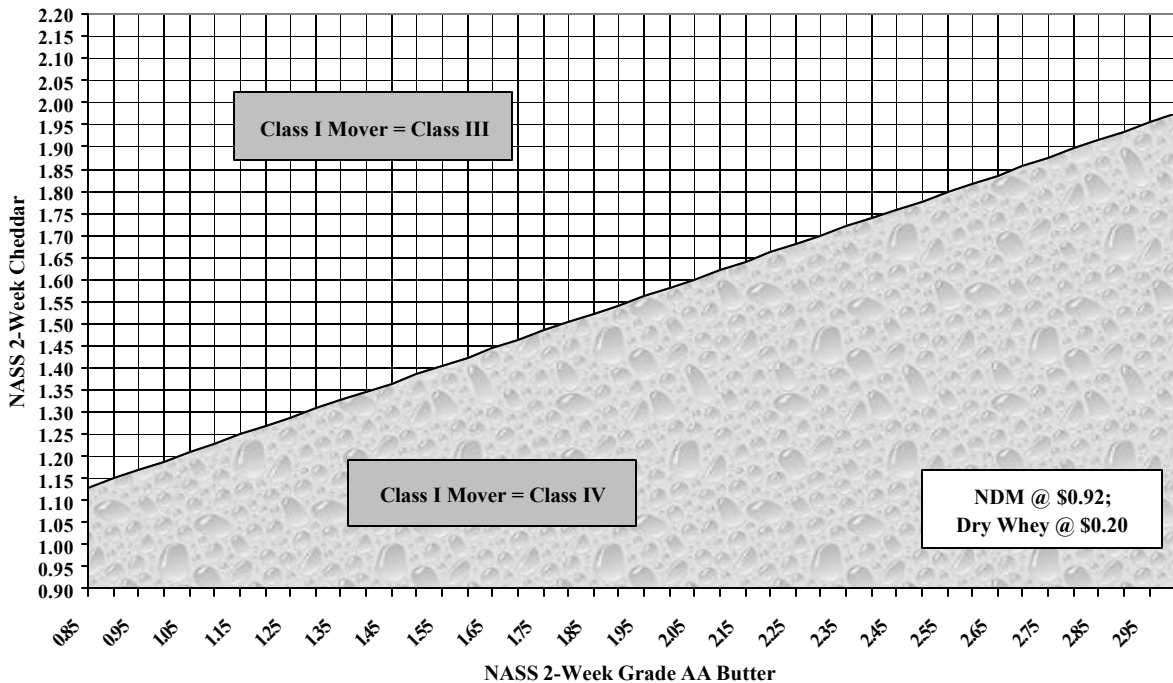
the mover in only one additional month if the new formulas had been in effect since January 2001 (July 2001).

Nonfat dry milk prices are tied closely to the CCC purchase price, and change little from month to month. Whey prices are more variable, but the other solids value is a relatively small part of the Class III price. Whether the advance Class III or Class IV skim milk pricing factor serves as the Class I mover depends mainly on the relative prices of Grade AA butter and Cheddar cheese as reported by NASS.

The chart below demonstrates this relationship with NDM prices fixed at \$0.92 per pound and dry whey prices fixed at \$0.20 per pound. With the assumed NDM and dry whey prices, the combination of butter and cheese prices will determine whether the advanced Class III or Class IV price is the Class I mover. For example, at a NASS two-week cheese price of \$1.30, the NASS two-week Grade AA butter price would have to exceed \$1.35 per pound for Class IV to be the Class I mover. With butter at \$1.85, the cheese price would have to be higher than about \$1.50 for Class III to be the mover.

With dry whey at 16 cents per pound or higher and other commodities at current CCC support levels (cheese: \$1.1314, butter: \$.8548, and nonfat dry milk: \$0.90), Class III will be the Class I mover. Butter-powder “tilts” that reduce the CCC purchase price for nonfat dry milk prices and correspondingly raise the purchase price for butter would keep Class III as the mover when all CCC purchase prices were at support except at very low whey prices.

Relationship of Class I Mover to Butter and Cheese Prices



**Appendix:
Pricing Formulas as Modified by the Final Decision⁴**

Class III/IV:

Butterfat price (per lb.): (NASS AA butter price - \$0.115) * 1.20

Class IV:

Class IV nonfat solids price (per lb.): (NASS nonfat dry milk price - \$0.14)*0.99

Class IV skim milk price (per cwt): (Class IV nonfat solids price X 9)

Class IV price (per cwt): (Class IV skim milk price X 0.965) + (Butterfat price X 3.5)

Class III:

NASS weighted avg. cheese price (per lb.): Weighted average of the NASS 500-pound barrel price (adjusted to 38% moisture) plus 3 cents and the NASS 40- pound block price, both as reported by the Department for the month

Class III protein price (per lb.): ((NASS wtd. avg. cheese price - \$0.165) X 1.383)
+ (((NASS wtd. avg. cheese price - \$0.165) X 1.572) - (Butterfat price X 0.90)) X 1.17)

Class III other nonfat solids (per lb.): (NASS dry whey price - \$0.159 M.A.) *1.03

Class III skim milk price (per cwt): (Class III protein price X 3.1) + (Other nonfat solids price X 5.9)

Class III price (per cwt): (Class III skim milk price X 0.965) + (Butterfat price X 3.5)

Class II:

Class II skim milk price (per cwt): (Advanced Class IV skim milk price + \$0.70)

Class II nonfat solids price (per lb.): (Class II skim milk price) / 9

Class II butterfat price (per lb.): (Butterfat price + \$0.007)

Class II price (per cwt): (Class II skim milk price X 0.965) + (Class II butterfat price X 3.5)

⁴ Adapted from: U.S. Department of Agriculture, Marketing and Regulatory Programs, Agricultural Marketing Service, Dairy Programs, Economic Analysis for the Final Decision on Class III and Class IV Price Formulas, Washington, DC: November 2002. More detail can be obtained from the *Understanding Dairy Markets* website: www.aae.wisc.edu/future/front_class_price_changes.htm.

Class I:

Class I skim milk price (per cwt):	The skim milk price of the higher of the advanced Class III or Class IV milk prices plus the Class I differential adjusted for location
Class I butterfat price (per lb.):	The butterfat price plus (the Class I differential adjusted for location divided by 100)
Class I price (per cwt):	$(\text{Class I skim milk price} \times 0.965) + (3.5 \times \text{Class I butterfat price})$
Advanced pricing factors:	For use in calculating the Class I skim milk and butterfat prices and the Class II skim milk and nonfat solids prices, the advanced pricing factors are computed using the weighted average of the 2 most recent NASS U.S. average weekly survey prices announced before the 24th day of the month.

Prices to producers:

Skim/butterfat orders:	No change from current
Component orders:	
Protein price (per lb.):	Protein price from Class III protein price calculation.
Other solids price (per lb.):	Other solids price from Class III other solids price calculation.
Butterfat price (per lb.):	Butterfat price from Class III and IV butterfat price calculation.

*All hundredweight prices are rounded to the nearest whole cent.
All component prices are rounded to the nearest one-hundredth cent.*