USDA Agricultural Marketing Service (AMS)

Economic Analysis
Class III and IV Pricing Formulas
Tentative Partial Final Decision

March 2008

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Dairy Programs

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Introduction

The Department has performed this analysis in order to provide further information to all interested parties regarding the effects of proposed changes to the pricing formulas used to price Class III and Class IV milk pooled under Federal Milk marketing orders (FMMO). Under this proposal, manufacturing allowances commonly referred to as "make allowances," are increased as illustrated in Table 1. Additionally, the butterfat yield factor is increased from 1.20 to 1.211.

The current make allowances were established in an interim final rule of December 2006. These make allowances are derived from two sources (1) *Cost of Processing in Cheese, Whey, Butter and Nonfat Dry Milk Plants*, by Mark Stephenson, Ph.D., Cornell Program on Dairy Markets and Policy, September 1, 2006; and (2) *Weighted Average Manufacturing Costs for Butter, Nonfat Powder, Skim Whey Powder and Cheddar Cheese, California Department of Food and Agriculture*, Costs for Calendar Year 2004, amended January 2006.

The make allowances proposed in this tentative partial final decision come from the most recent surveys of those same sources: *Testimony on Cost of Processing in Cheese, Whey, Butter and Nonfat Dry Milk Plants*, by Mark Stephenson, Ph.D., Cornell Program on Dairy Markets and Policy, July 9, 2007 (Cornell study); and (2) *Weighted Average Manufacturing Costs for Butter, Nonfat Powder, Skim Whey Powder and Cheddar Cheese, California Department of Food and Agriculture*, Costs for Calendar Year 2006, published September 2007 (CDFA study). The Cornell study encompassed data from last quarter of 2005 through the second quarter of 2007, but it was submitted in testimony that a large proportion of the data apply to the calendar year of 2006.

In calculating make allowances for butter and nonfat dry milk (NFDM), weighted average costs from both studies are weighted by their respective product volumes for the calendar year 2006 to estimate an overall U.S. weighted average. The weighted average costs for cheese manufacturing are based solely on the data from the CDFA study and the costs for dry whey manufacturing use data only from the Cornell study. An additional $0.0015 per pound is added in the calculation of the final make allowance as an estimate of sales and administrative costs.

Table 1. Calculation of Make Allowances as Proposed in Tenative Final Decision

Butter		NFDM	
Weighted average cost, $/pound:		Weighted average cost, $/pound:	
CDFA Study[1]	0.1373	CDFA Study	0.1664
Cornell Study[2]	0.1846	Cornell Study	0.1662
2006 volume[3], 1000 pounds:		2006 volume, 1000 pounds:	
California	448,592	California	613,240
U.S. other than California	999,890	U.S. other than California	610,832
U.S.	1,448,482	U.S.	1,224,072
Weighted average cost per pound:		Weighted average cost per pound:	
Before sales and administrative costs	0.1700	Before sales and administrative costs	0.1663
Sales and administrative costs	0.0015	Sales and administrative costs	0.0015
Proposed make allowance	0.1715	Proposed make allowance	0.1678

Cheese		Whey	
Weighted average cost, Cheddar cheese, $/pound:		Weighted average cost, $/pound:	
CDFA Study	0.1988	Cornell Study	0.1976
Sales and administrative costs	0.0015	Sales and administrative costs	0.0015
Proposed make allowance	0.2003	Proposed make allowance	0.1991

[1] *Weighted Average Manufacturing Costs for Butter, Nonfat Powder, Skim Whey Powder and Cheddar Cheese,* California Department of Food and Agriculture, Costs for Calendar Year 2006, September 2007

[2] *Testimony on Cost of Processing in Cheese, Whey, Butter, and Nonfat Dry Milk Plants,* by Mark Stephenson, Cornell Program on Dairy Markets and Policy, July 2007

[3] Source for all volumes: USDA, National Agricultural Statistics Service, 2006 values

Economic Analysis Framework

This document provides analysis of the proposed changes to Class III and Class IV pricing formulas using *USDA Agricultural Baseline Projections to 2016,* published in February 2007[1]. Baseline projections have been adjusted to reflect make allowances as stated in the December 2006 Interim Final Rule. These make allowances became effective February 1, 2007. (See Appendix for current formulas.) Hereafter, all impacts are stated as changes from the USDA baseline projections as adjusted for the new make allowances.

The most current version of the Dairy Programs National Econometric Model is used, as described in *National Econometric Baseline Documentation (Model Calibrated to USDA Baseline Projections to 2016),* published in April 2007[2]. The USDA baseline and the model baseline assume: (1) Milk Price Support Program (MPSP) will continue unchanged; (2) the Dairy Export Incentive Program (DEIP) will not be used throughout the projection period; (3) the Milk Income Loss Contract Program (MILC) terminated in 2007 and is not renewed; and (4) the Federal Milk Marketing Order Program (FMMO) will continue unchanged. This analysis assumes that the first three assumptions remain unchanged and that the FMMO changes are limited to the changes in make allowances and butterfat yield factor proposed in this decision. As the model is an annual model, it is assumed that these changes are effective January 1, 2008.

The econometric model used for this analysis includes demands for fluid milk products and manufactured dairy products. Demands for fluid milk and manufactured dairy products are functions of per capita consumption and population. Per capita consumption for the major milk and dairy products are estimated as functions of own prices, substitute prices, and income. The demands for fluid milk and soft manufactured products are satisfied first by the eligible supply of milk. The milk supply for manufactured hard products is the volume of milk marketings remaining after satisfying the volumes demanded for fluid and soft manufactured products. Milk is manufactured into dairy products according to returns to manufacturing in each class. Wholesale prices for cheese, butter, nonfat dry milk (NFDM) and dry whey reflect supply and demand conditions for these products. These manufactured dairy product prices underlie the FMMO pricing system.

[1] OCE-2007-1 http://www.usda.gov/oce/commodity/ag_baseline.htm
[2] http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5056334

Static Results

The proposed changes to the Class III and Class IV formulas have direct impact on the values of milk pricing components and consequently Federal order minimum prices. Table 2 illustrates the static impact of these changes, that is, without accounting for the changes in supply and allocation that would occur as prices change. Component prices fall as make allowances increase. The protein price is the most affected by the proposed changes given that this formula incorporates not only adjustments for the make allowance for cheese, but also includes the butterfat price which itself is altered by the change in the make allowance for butter as well as the change in butterfat yield.

Table 2. Static Results of Proposed Changes to Class III and Class IV Pricing Formulas [1]

Product Prices ($/pound)	Baseline			
Cheese	1.5538			
Butter	1.8296			
NFDM	1.0120			
Dry Whey	0.3624			
Make allowances ($/pound)				
	Current	Proposed	Change	Percent Change
Cheese	0.1682	0.2003	0.0321	19.1
Butter	0.1202	0.1715	0.0513	42.7
NFDM	0.1570	0.1678	0.0108	6.9
Dry Whey	0.1956	0.1991	0.0035	1.8
Change in component values assuming no supply response ($/pound)				
Protein	2.3047	2.2469	-0.0578	-2.5
Butterfat [2]	2.0513	2.0080	-0.0433	-2.1
Nonfat solids	0.8465	0.8358	-0.0107	-1.3
Other solids	0.1718	0.1682	-0.0036	-2.1
Change in milk prices assuming no supply response ($/cwt.)				
Class III skim milk	8.16	7.96	-0.20	-2.5
Class IV skim milk	7.62	7.52	-0.10	-1.3
Class III price at 3.5% butterfat	15.05	14.71	-0.34	-2.3
Class IV price at 3.5% butterfat	14.53	14.29	-0.24	-1.7

[1] Nine-year average baseline prices are used in the formulas for calculations.

[2] Proposed butterfat yield factor is 1.211

Model Results

An increase in make allowances has the immediate effect of lowering FMMO component values which, through price formulas, translate into decreased minimum prices for milk and a reduction in producer revenue (Table 3). As producer revenue falls, supply tightens and production of hard manufactured dairy products decreases, which in turn results in higher prices for those products. These higher product prices, however, are not sufficient to offset the greater impact of the increased make allowances in the pricing formulas. Declines in Class I and Class II prices follow, as they are based on the Class III and Class IV skim milk and butterfat prices.

All-Milk Price and Milk Production

Increases in the make allowances result in a lower all-milk price paid by plants (Table 4). The effect diminishes over the nine-year projection period, falling $0.14 per hundredweight (cwt) or 0.93 percent below the baseline level of $14.74 per cwt in the first year. The price impact declines and settles to $0.04 below baseline in the final four years to reach an average decrease of $0.06 (0.39 percent) below the baseline average price of $16.22 per cwt over the nine-year projection. Producer revenue follows suit, falling throughout the projection period with the greatest losses early in the period for an average decrease of $156 million (0.51 percent). The greatest producer revenue impact is in the first year, $262 million (0.97 percent) below baseline.

In response, milk production falls increasingly below baseline levels, averaging a decrease of 240 million pounds (0.13 percent) as shown in Table 5. The cumulative changes range from a decrease of 72 million pounds (0.04 percent) below baseline level in the first year to a decrease of 328 million pounds (0.17 percent) in the final year of the projection. The marginal changes decline throughout the period to reach 13 million pounds by 2015. The change in production is the result of a reduction in yield as well as in cow numbers. Cows are reduced by an average 7000 head (0.08 percent) over the projection period while yield falls an average nine pounds per cow (0.04 percent) over that same period. The variation from baseline levels is greatest at the end of the period, with a decrease of 9000 cows (0.10 percent) and yield 15 pounds (0.07 percent) below baseline.

Product Prices

The contraction in milk production results in higher prices of major dairy products: cheese, butter, nonfat dry milk, and dry whey, illustrated in Table 6. Increased product prices counteract the reduction in milk prices due to the higher make allowances. The greatest impact to product prices, nominally and by percentage, is on the butter price. The increase is greatest in the first year of the projection period at $0.0393 per pound (2.46 percent) over baseline. The effect diminishes over the projection period, resulting in an average increase of $0.0346 (1.89 percent). The cheese price exhibits the next largest

impact, rising an average $0.0176 per pound (1.14 percent) above baseline levels. The change is smallest in the first year at $0.0090 per pound (0.63 percent) and increases over time until stabilizing at $0.0201 per pound below baseline in the final three years of the period. Nonfat dry milk and dry whey demand functions are more elastic and thus bring about smaller price increases over baseline levels.

Table 3. Model Results for Proposed Class III and Class IV Pricing Changes

Nine-year averages, 2008 through 2016

Scenario	Units	Baseline [1]	Decision
			Change from Baseline
F.O. Minimum Prices, 3.5% BF			
Class I	$/cwt	17.76	-0.14
Class II	$/cwt	15.23	-0.02
Class III	$/cwt	15.05	-0.14
Class IV	$/cwt	14.53	-0.02
Blend	$/cwt	16.00	-0.11
F.O. Minimum Prices at Test			
Class I	$/cwt	14.90	-0.14
Class II	$/cwt	23.79	-0.03
Class III	$/cwt	14.76	-0.14
Class IV	$/cwt	19.09	0.05
Blend	$/cwt	16.43	-0.11
NASS Wtd. Avg. Product Prices			
Cheddar	$/pound	1.5538	0.0176
Butter	$/pound	1.8296	0.0346
NFDM	$/pound	1.0120	0.0090
Whey	$/pound	0.3624	0.0034
Retail fluid milk price	$/gal.	3.4135	-0.0094
Component Prices			
Protein	$/pound	2.3048	-0.0451
Butterfat	$/pound	2.0513	-0.0014
Other solids	$/pound	0.1718	-0.0001
Nonfat solids	$/pound	0.8465	-0.0018

Table continued on next page

Table 3 Continued. Model Results for Proposed Class III and Class IV Pricing Changes

Nine-year averages, 2008 through 2016

Scenario		Baseline	Decision
	Units		Change from Baseline
Skim Milk Prices			
Class I skim price	$/cwt	10.87	-0.14
Class II skim price	$/cwt	8.32	-0.02
Class III skim price	$/cwt	8.16	-0.14
Class IV skim price	$/cwt	7.62	-0.02
F.O. Class Uses			
Class I	mil. pounds	44,987	32
Class II	mil. pounds	17,350	5
Class III	mil. pounds	53,030	-55
Class IV	mil. pounds	11,181	-127
Total Marketings	mil. pounds	126,548	-145
Federal Order Cash Receipts	mil. $	20,808	-165
All Milk Price	$/cwt	16.22	-0.06
Milk Cows	1,000s	8,667	-7
Yield per Cow	pounds	21,722	-9
U.S. Marketings [2]	mil. pounds	187,533	-240
Government removals of NFDM	mil. pounds	2	0
U.S. Producer Revenue	mil. $	30,447	-156

[1] In this analysis, the baseline reflects adjustments from the published USDA baseline to reflect changes in manufacturing (make) allowances per the Interim Final Rule issued by USDA on December 26, 2006.

[2] U.S. Marketings differs from U.S. milk production due to farm use of milk.

Table 4. All-Milk Price and Producer Revenue

	Units	Scenario	2008	2009	2010	2011	2012	2013	2014	2015	2016	9 Yr. Avg.
All Milk	$/cwt	Baseline	14.74	15.40	15.93	16.33	16.55	16.63	16.77	16.80	16.86	16.22
	$/cwt	Decision	-0.14	-0.10	-0.07	-0.06	-0.05	-0.04	-0.04	-0.04	-0.04	-0.06
	percent	Decision	-0.93	-0.63	-0.46	-0.35	-0.28	-0.26	-0.23	-0.21	-0.21	-0.39
Producer Revenue	mil. $	Baseline	26,952	28,158	29,254	30,195	30,963	31,350	31,934	32,334	32,886	30,447
	mil. $	Decision	-262	-200	-168	-145	-132	-129	-124	-122	-124	-156
	percent	Decision	-0.97	-0.71	-0.57	-0.48	-0.43	-0.41	-0.39	-0.38	-0.38	-0.51

Table 5. Milk Production Variables

	Units	Scenario	2008	2009	2010	2011	2012	2013	2014	2015	2016	9 Yr. Avg.
Milk Cows	1,000s	Baseline	8,945	8,853	8,768	8,701	8,642	8,590	8,544	8,501	8,458	8,667
	1,000s	Decision	-4	-6	-7	-8	-8	-8	-8	-9	-9	-7
	Percent	Decision	-0.04	-0.06	-0.08	-0.09	-0.09	-0.10	-0.10	-0.10	-0.10	-0.08
Yield per Cow	Pounds	Baseline	20,540	20,745	21,021	21,332	21,719	21,998	22,343	22,694	23,110	21,722
	Pounds	Decision	0	-4	-7	-9	-11	-12	-13	-14	-15	-9
	Percent	Decision	0.00	-0.02	-0.03	-0.04	-0.05	-0.05	-0.06	-0.06	-0.07	-0.04
Milk Production	mil. Pounds	Baseline	183,741	183,666	184,323	185,619	187,697	188,961	190,906	192,923	195,460	188,144
	mil. Pounds	Decision	-72	-152	-204	-240	-266	-285	-302	-315	-328	-240
	Percent	Decision	-0.04	-0.08	-0.11	-0.13	-0.14	-0.15	-0.16	-0.16	-0.17	-0.13
Farm Use	mil. Pounds	Baseline	900	800	700	700	600	500	500	400	400	611
Marketings	mil. Pounds	Baseline	182,841	182,866	183,623	184,919	187,097	188,461	190,406	192,523	195,060	187,533
	mil. Pounds	Decision	-72	-152	-204	-240	-266	-285	-302	-315	-328	-240
	Percent	Decision	-0.04	-0.08	-0.11	-0.13	-0.14	-0.15	-0.16	-0.16	-0.17	-0.13

Table 6. Product Prices

	Units	Scenario	2008	2009	2010	2011	2012	2013	2014	2015	2016	9 Yr. Avg.
Cheddar cheese	$/pound	Baseline	1.4259	1.4931	1.5358	1.5698	1.5885	1.5863	1.5959	1.5933	1.5959	1.5538
	$/pound	Decision	0.0090	0.0141	0.0169	0.0187	0.0197	0.0199	0.0201	0.0202	0.0201	0.0176
	Percent	Decision	0.63	0.95	1.10	1.19	1.24	1.26	1.26	1.27	1.26	1.14
Butter	$/pound	Baseline	1.5953	1.7118	1.8014	1.8431	1.8591	1.8898	1.9074	1.9168	1.9420	1.8296
	$/pound	Decision	0.0393	0.0369	0.0334	0.0329	0.0332	0.0329	0.0336	0.0348	0.0346	0.0346
	Percent	Decision	2.46	2.15	1.85	1.79	1.79	1.74	1.76	1.82	1.78	1.89
Nonfat dry milk	$/pound	Baseline	0.9635	0.9819	1.0115	1.0243	1.0274	1.0326	1.0272	1.0205	1.0193	1.0120
	$/pound	Decision	0.0038	0.0069	0.0096	0.0106	0.0105	0.0105	0.0100	0.0094	0.0092	0.0090
	Percent	Decision	0.39	0.71	0.95	1.03	1.02	1.02	0.98	0.93	0.91	0.88
Dry whey	$/pound	Baseline	0.3197	0.3249	0.3376	0.3529	0.3627	0.3749	0.3894	0.3981	0.4014	0.3624
	$/pound	Decision	0.0013	0.0021	0.0027	0.0033	0.0037	0.0040	0.0044	0.0046	0.0047	0.0034
	Percent	Decision	0.40	0.65	0.81	0.93	1.01	1.08	1.12	1.16	1.18	0.94
Retail fluid milk	$/gallon	Baseline	3.1407	3.2299	3.3051	3.3758	3.4354	3.4814	3.5378	3.5833	3.6325	3.4135
	$/gallon	Decision	-0.0161	-0.0121	-0.0100	-0.0086	-0.0078	-0.0076	-0.0074	-0.0073	-0.0074	-0.0094
	Percent	Decision	-0.51	-0.38	-0.30	-0.25	-0.23	-0.22	-0.21	-0.20	-0.20	-0.27

The nonfat dry milk price increases an average $0.0090 per pound (0.88 percent) while the dry whey price increases an average $0.0034 per pound (0.94 percent).

The demand for fluid milk is more inelastic and retail price falls below baseline levels by an average of $0.0094 per gallon (0.27 percent) over the projection period. The retail price follows the direction of change in the all-milk price, also falling the furthest below baseline in the beginning years of the projection period.

Component Prices and Pricing Factors

All Federal order component prices (butterfat, protein, nonfat solids, and other solids) are below average baseline levels over the projection period as presented in Table 7.

In the case of most component prices, the effects over a nine-year period are smaller than those examined in the static analysis. After the initial impact, markets respond and move back toward the baseline and a new equilibrium. Only the protein price shows a larger divergence from the baseline than in the static calculations, falling $0.0763 per pound (3.49 percent) below baseline in the first year and diminishing to an average $0.0451 per pound (1.96 percent) below baseline over the nine-year projection. This is due in large part to the relationship of butter and cheese prices over the course of the projection period. The increase in the butter price is greater than that of the cheese price, nominally as well as proportionally. As a result, the butterfat portion of the protein price (which is subtracted) exceeds the smaller increase attributed to the cheese price.

Lower component prices result in lower Class III and Class IV skim prices. The Class III skim price falls further below its baseline levels (an average $0.14 per pound or 1.72 percent), than the Class IV skim price (an average $0.02 per pound or 0.22 percent), but remains high enough that the Class III skim price remains the price mover for the Class I skim price throughout the projection period.

Federal order minimum prices at 3.5 percent butterfat also fall below baseline levels (Table 8). Across all minimum prices, the greatest effect is in the first year, the uniform price falling $0.19 (1.34 percent) below baseline. The greatest impact is in the Class III minimum price, which falls an average $0.14 (0.93 percent) over the projection period. As the Class III price remains the mover for Class I prices in all years, the Class I price falls an average $0.14 per cwt below baseline levels as well.

Federal Order Prices at Class Butterfat Tests

The average butterfat test remains unchanged from the baseline for Class I and Class II milk (Table 9). However, the higher butter price creates a movement of butterfat from Class III to Class IV. Marketings decrease in all classes, but Class IV marketings carry the greatest loss, proportionally. There is less milk available over all, and even less milk being allocated to manufacturing classes. Class butterfat tests and minimum prices at test illustrate the response within the manufacturing classes to the tighter supply of milk.

Table 7. Federal Order Component Prices and Pricing Factors

	Units	Scenario	2008	2009	2010	2011	2012	2013	2014	2015	2016	9 Yr. Avg.
Butterfat	$/pound	Baseline	1.7701	1.9100	2.0174	2.0674	2.0867	2.1236	2.1447	2.1559	2.1862	2.0513
	$/pound	Decision	0.0017	0.0000	-0.0032	-0.0033	-0.0028	-0.0029	-0.0018	-0.0002	-0.0002	-0.0014
	percent	Decision	0.09	0.00	-0.16	-0.16	-0.13	-0.13	-0.08	-0.01	-0.01	-0.07
Protein	$/pound	Baseline	2.1886	2.2581	2.2825	2.3393	2.3793	2.3335	2.3421	2.3217	2.2984	2.3048
	$/pound	Decision	-0.0763	-0.0580	-0.0455	-0.0396	-0.0370	-0.0362	-0.0367	-0.0381	-0.0384	-0.0451
	percent	Decision	-3.49	-2.57	-1.99	-1.69	-1.56	-1.55	-1.57	-1.64	-1.67	-1.96
Nonfat Solids	$/pound	Baseline	0.7984	0.8166	0.8459	0.8586	0.8617	0.8669	0.8615	0.8548	0.8536	0.8465
	$/pound	Decision	-0.0070	-0.0038	-0.0012	-0.0002	-0.0003	-0.0003	-0.0008	-0.0013	-0.0016	-0.0018
	percent	Decision	-0.87	-0.47	-0.14	-0.03	-0.03	-0.03	-0.09	-0.16	-0.18	-0.22
Other Solids	$/pound	Baseline	0.1278	0.1332	0.1463	0.1620	0.1721	0.1847	0.1996	0.2086	0.2119	0.1718
	$/pound	Decision	-0.0023	-0.0014	-0.0008	-0.0002	0.0002	0.0005	0.0009	0.0011	0.0013	-0.0001
	percent	Decision	-1.79	-1.08	-0.54	-0.14	0.11	0.30	0.45	0.55	0.59	-0.05
Class I Skim	$/cwt	Baseline	10.25	10.50	10.65	10.92	11.10	11.03	11.15	11.14	11.09	10.87
	$/cwt	Decision	-0.25	-0.19	-0.15	-0.12	-0.11	-0.11	-0.11	-0.11	-0.11	-0.14
	percent	Decision	-2.44	-1.79	-1.37	-1.14	-1.02	-0.99	-0.97	-1.00	-1.01	-1.29
Class II Skim	$/cwt	Baseline	7.89	8.05	8.31	8.43	8.46	8.50	8.45	8.39	8.38	8.32
	$/cwt	Decision	-0.06	-0.03	-0.01	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.02
	percent	Decision	-0.80	-0.43	-0.13	-0.03	-0.03	-0.03	-0.08	-0.14	-0.17	-0.20
Class III Skim	$/cwt	Baseline	7.54	7.79	7.94	8.21	8.39	8.32	8.44	8.43	8.38	8.16
	$/cwt	Decision	-0.25	-0.19	-0.15	-0.12	-0.11	-0.11	-0.11	-0.11	-0.11	-0.14
	percent	Decision	-3.32	-2.42	-1.84	-1.51	-1.35	-1.31	-1.29	-1.32	-1.33	-1.72
Class IV Skim	$/cwt	Baseline	7.19	7.35	7.61	7.73	7.76	7.80	7.75	7.69	7.68	7.62
	$/cwt	Decision	-0.06	-0.03	-0.01	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.02
	percent	Decision	-0.87	-0.47	-0.14	-0.03	-0.03	-0.03	-0.09	-0.16	-0.18	-0.22

Table 8. Federal Order Milk Prices at 3.5 Percent Butterfat

	Units	Scenario	2008	2009	2010	2011	2012	2013	2014	2015	2016	9 Yr. Avg.
Class I	$/cwt.	Baseline	16.18	16.91	17.43	17.87	18.11	18.17	18.36	18.39	18.44	17.76
	$/cwt.	Decision	-0.24	-0.18	-0.15	-0.13	-0.12	-0.12	-0.11	-0.11	-0.11	-0.14
	percent	Decision	-1.46	-1.07	-0.87	-0.74	-0.66	-0.63	-0.60	-0.59	-0.59	-0.79
Class II	$/cwt.	Baseline	13.83	14.48	15.11	15.39	15.49	15.66	15.69	15.67	15.77	15.23
	$/cwt.	Decision	-0.05	-0.03	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02
	percent	Decision	-0.40	-0.23	-0.15	-0.09	-0.08	-0.08	-0.08	-0.08	-0.09	-0.14
Class III	$/cwt.	Baseline	13.47	14.20	14.72	15.16	15.40	15.46	15.65	15.68	15.73	15.05
	$/cwt.	Decision	-0.24	-0.18	-0.15	-0.13	-0.12	-0.12	-0.11	-0.11	-0.11	-0.14
	percent	Decision	-1.75	-1.28	-1.03	-0.87	-0.78	-0.75	-0.71	-0.69	-0.69	-0.93
Class IV	$/cwt.	Baseline	13.13	13.78	14.41	14.69	14.79	14.96	14.99	14.97	15.07	14.53
	$/cwt.	Decision	-0.05	-0.03	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02
	percent	Decision	-0.42	-0.24	-0.15	-0.09	-0.08	-0.08	-0.09	-0.08	-0.10	-0.14
Uniform at 3.5% BF	$/cwt.	Baseline	14.48	15.19	15.73	16.13	16.33	16.41	16.55	16.56	16.61	16.00
	$/cwt.	Decision	-0.19	-0.15	-0.12	-0.10	-0.09	-0.09	-0.09	-0.08	-0.08	-0.11
	percent	Decision	-1.34	-0.97	-0.78	-0.65	-0.58	-0.55	-0.52	-0.51	-0.51	-0.70

Table 9. Average Class Butterfat
Test

	Units	Scenario	2008	2009	2010	2011	2012	2013	2014	2015	2016	9 Yr. Avg.
Class I	percent	Baseline	2.047	2.047	2.047	2.047	2.047	2.047	2.047	2.047	2.047	2.047
	percent	Decision	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Class II	percent	Baseline	7.828	7.835	7.840	7.840	7.837	7.835	7.832	7.827	7.822	7.833
	percent	Decision	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Class III	percent	Baseline	3.375	3.368	3.361	3.355	3.351	3.346	3.343	3.339	3.336	3.353
	percent	Decision	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Class IV	percent	Baseline	5.711	5.906	6.000	5.987	5.911	5.855	5.746	5.639	5.558	5.813
	percent	Decision	0.026	0.037	0.041	0.041	0.039	0.037	0.035	0.033	0.031	0.036

Across all classes, the greatest diversion from baseline prices at test is in the first year (Table 10). Even the Class IV price at test, which increases on average during the projection period, falls by $0.01 per cwt (0.03 percent) in the projection for 2008. This initial drop due to the make allowance changes, is mitigated by reallocation of butterfat from Class III to Class IV. The Class III butterfat test falls slightly, 0.002 percent below baseline levels in each year. The Class IV butterfat test increases in every year of the projection period by an average 0.03 percent.

The butterfat tests for Class I and Class II remain unchanged signaling that product mix for each of those classes remains stable. Regarding Class III and Class IV, however, there is less milk being allocated to manufacturing and within these classes, the product mix is changing. In Class III specifically, disappearance of other than American cheese drops further, an average 9 million pounds (0.14 percent) below baseline than the higher-fat American cheese at an average 6 million pounds (0.15 percent) below baseline levels. The movement of butterfat from Class III to Class IV mitigates the reduction in Class IV butterfat due to the loss of marketings. The reduction in commercial disappearance of butter remains constant at 1 million pounds below baseline throughout the projection period.

A greater butterfat test in Class IV places upward pressure on the price. The Class IV price at test moves above baseline levels over the course of the projection period and averages $0.05 per cwt (0.24 percent) above baseline over the nine years. This increase is not translated into a Class II increase because Class II butterfat content does not change from baseline levels. Federal order prices move below baseline levels for all other classes, resulting in an average decrease in the uniform price of $0.11 per cwt (0.68 percent) over the projection period. The greatest average impact on prices at test is seen in the Class I and Class III prices, which fall $0.24 per cwt below baseline in the first year before settling at $0.11 below baseline in the final projection years.

Federal Order Marketings and Cash Receipts

Total Federal order marketings (Table 11) are 34 million pounds (0.03 percent) below baseline in the first projection year and the gap widens at a decreasing marginal rate over time, reaching 200 million pounds (0.15 percent) below baseline in 2016 for an average shortfall of 145 million pounds (0.11 percent). A clear divide emerges in the response of the varying classes. Class I and Class II marketings increase in response to lower prices, and coupled with reduced total milk marketings, reduce Class III and Class IV marketings. Class I and Class II marketings increase at a decreasing rate until settling for the last three years of the projection period while Class III and Class IV marketings fall increasingly below baseline levels. U.S. Marketings (Table 12) vary in similar fashion.

The decreases in Class III and Class IV marketings are indicative of a decreased demand for manufacturing milk. The higher dairy products prices result in a contraction in the quantities demanded of cheese, butter, and nonfat dry milk. Domestic commercial disappearance, illustrated in Table 13, falls below baseline averages for all these products. The most affected, in terms of

volume, is other than American cheese, which averages 9 million pounds below baseline (0.15 percent) over the projection period. The next greatest change, and greatest proportionally, is in disappearance of nonfat dry milk, which begins with a decrease of 3 million pounds in the first year and settles at 8 million pounds below baseline beginning in 2011 to average a decrease of 7 million pounds (0.66 percent) over the nine-year period. Some of the milk that would have gone to manufacturing these products is reallocated to Class I and Class II products

Lower milk marketings and lower farm milk prices translate into a decrease in revenue (Table 14). Total Federal order receipts decrease by an average $165 million (0.79 percent) over the nine-year projection. Class III receipts fall the furthest over the projection period with an average decrease in revenue of $84 million (1.07 percent). The increased marketings for Class I and Class II milk are not enough to overcome the lower prices and decline in total receipts for both those classes as well. The most modest impacts are in Class II receipts, averaging $3 million (0.08 percent) below baseline, never falling more than $6 million (0.17 percent) below baseline levels.

Table 10. Federal Order Milk Prices at Test

	Units	Scenario	2008	2009	2010	2011	2012	2013	2014	2015	2016	9 Yr. Avg.
Class I	$/cwt	Baseline	13.72	14.25	14.62	14.98	15.20	15.21	15.37	15.38	15.39	14.90
	$/cwt	Decision	-0.24	-0.18	-0.15	-0.13	-0.12	-0.11	-0.11	-0.11	-0.11	-0.14
	percent	Decision	-1.76	-1.29	-1.02	-0.86	-0.77	-0.74	-0.71	-0.71	-0.71	-0.94
Class II	$/cwt	Baseline	21.18	22.44	23.53	24.03	24.20	24.53	24.64	24.67	24.88	23.79
	$/cwt	Decision	-0.05	-0.03	-0.04	-0.03	-0.02	-0.02	-0.02	-0.01	-0.01	-0.03
	percent	Decision	-0.21	-0.14	-0.15	-0.12	-0.10	-0.10	-0.08	-0.05	-0.06	-0.11
Class III	$/cwt	Baseline	13.26	13.96	14.45	14.87	15.10	15.15	15.32	15.35	15.39	14.76
	$/cwt	Decision	-0.24	-0.19	-0.16	-0.14	-0.12	-0.12	-0.11	-0.11	-0.11	-0.14
	percent	Decision	-1.80	-1.33	-1.08	-0.91	-0.81	-0.78	-0.74	-0.73	-0.73	-0.97
Class IV	$/cwt	Baseline	16.88	18.20	19.26	19.64	19.63	19.78	19.63	19.42	19.41	19.09
	$/cwt	Decision	-0.01	0.04	0.05	0.06	0.06	0.06	0.06	0.06	0.05	0.05
	percent	Decision	-0.03	0.20	0.26	0.31	0.30	0.29	0.28	0.29	0.27	0.24
Uniform	$/cwt	Baseline	14.84	15.58	16.15	16.56	16.77	16.86	17.01	17.02	17.09	16.43
	$/cwt	Decision	-0.19	-0.15	-0.12	-0.10	-0.09	-0.09	-0.09	-0.08	-0.08	-0.11
	percent	Decision	-1.30	-0.94	-0.76	-0.63	-0.56	-0.54	-0.51	-0.49	-0.49	-0.68

Table 11. Federal Order Marketings

	Units	Scenario	2008	2009	2010	2011	2012	2013	2014	2015	2016	9 Yr. Avg.
Class I	mil. pounds	Baseline	45,163	44,973	44,942	44,912	45,021	44,913	44,920	44,947	45,091	44,987
	mil. pounds	Decision	56	42	34	29	26	25	24	24	24	32
	percent	Decision	0.12	0.09	0.08	0.06	0.06	0.06	0.05	0.05	0.05	0.07
Class II	mil. pounds	Baseline	16,717	16,726	16,823	17,001	17,280	17,462	17,740	18,038	18,360	17,350
	mil. pounds	Decision	7	5	6	5	5	5	5	4	4	5
	percent	Decision	0.04	0.03	0.04	0.03	0.03	0.03	0.03	0.02	0.02	0.03
Class III	mil. pounds	Baseline	50,363	51,173	51,803	52,387	53,115	53,665	54,245	54,867	55,654	53,030
	mil. pounds	Decision	-16	-28	-40	-51	-60	-67	-72	-76	-79	-55
	percent	Decision	-0.03	-0.06	-0.08	-0.10	-0.11	-0.13	-0.13	-0.14	-0.14	-0.10
Class IV	mil. pounds	Baseline	11,665	10,811	10,488	10,530	10,802	10,994	11,377	11,792	12,173	11,181
	mil. pounds	Decision	-81	-108	-123	-129	-133	-137	-140	-143	-149	-127
	percent	Decision	-0.70	-1.00	-1.17	-1.22	-1.23	-1.24	-1.23	-1.22	-1.22	-1.14
Total	mil. pounds	Baseline	123,909	123,683	124,057	124,830	126,217	127,035	128,282	129,644	131,278	126,548
	mil. pounds	Decision	-34	-89	-123	-146	-162	-173	-184	-192	-200	-145
	percent	Decision	-0.03	-0.07	-0.10	-0.12	-0.13	-0.14	-0.14	-0.15	-0.15	-0.11

Table 12. U.S. Marketings

	Units	Scenario	2008	2009	2010	2011	2012	2013	2014	2015	2016	9 Yr. Avg.
Class I	mil. pounds	Baseline	54,810	54,579	54,542	54,505	54,637	54,506	54,514	54,548	54,722	54,596
	mil. pounds	Decision	68	51	42	35	32	31	30	29	29	38
	percent	Decision	0.12	0.09	0.08	0.06	0.06	0.06	0.05	0.05	0.05	0.07
Class II	mil. pounds	Baseline	19,553	19,563	19,676	19,884	20,210	20,424	20,749	21,097	21,473	20,292
	mil. pounds	Decision	8	6	7	6	6	6	5	4	4	6
	percent	Decision	0.04	0.03	0.04	0.03	0.03	0.03	0.03	0.02	0.02	0.03
Class III	mil. pounds	Baseline	91,736	93,211	94,359	95,423	96,749	97,751	98,808	99,939	101,373	96,594
	mil. pounds	Decision	-29	-52	-73	-93	-110	-122	-132	-139	-145	-99
	percent	Decision	-0.03	-0.06	-0.08	-0.10	-0.11	-0.13	-0.13	-0.14	-0.14	-0.10
Class IV	mil. pounds	Baseline	17,029	15,782	15,311	15,373	15,769	16,050	16,608	17,215	17,771	16,323
	mil. pounds	Decision	-119	-157	-180	-188	-194	-200	-205	-209	-217	-185
	percent	Decision	-0.70	-1.00	-1.17	-1.22	-1.23	-1.24	-1.23	-1.22	-1.22	-1.14
Total Class Use [1]	mil. pounds	Baseline	183,128	183,135	183,888	185,184	187,364	188,731	190,679	192,799	195,340	187,805
	mil. pounds	Decision	-72	-152	-204	-240	-266	-285	-302	-315	-328	-240
	percent	Decision	-0.04	-0.08	-0.11	-0.13	-0.14	-0.15	-0.16	-0.16	-0.17	-0.13

[1] Total Class Use differs from U.S. Marketings due to the presence of imported dairy ingredients.

Table 13. Domestic Commercial Disappearance

	Units	Scenario	2008	2009	2010	2011	2012	2013	2014	2015	2016	9 Yr. Avg.
American Cheese	mil. pounds	Baseline	4,011	4,043	4,064	4,089	4,131	4,159	4,195	4,236	4,292	4,136
	mil. pounds	Decision	-3	-5	-6	-6	-6	-6	-7	-7	-7	-6
	percent	Decision	-0.08	-0.12	-0.14	-0.15	-0.15	-0.15	-0.16	-0.16	-0.16	-0.14
Other Cheese	mil. pounds	Baseline	5,884	5,970	6,044	6,114	6,201	6,267	6,335	6,407	6,495	6,191
	mil. pounds	Decision	-3	-5	-7	-8	-10	-11	-12	-12	-13	-9
	percent	Decision	-0.05	-0.08	-0.11	-0.14	-0.16	-0.17	-0.19	-0.19	-0.20	-0.15
Butter	mil. pounds	Baseline	1,441	1,398	1,392	1,401	1,422	1,439	1,462	1,487	1,515	1,440
	mil. pounds	Decision	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
	percent	Decision	-0.06	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09	-0.09
Nonfat dry milk	mil. pounds	Baseline	1,001	1,010	1,015	1,032	1,061	1,082	1,116	1,151	1,187	1,073
	mil. pounds	Decision	-3	-5	-7	-8	-8	-8	-8	-8	-8	-7
	percent	Decision	-0.29	-0.53	-0.71	-0.77	-0.76	-0.76	-0.73	-0.69	-0.68	-0.66
Dry whey	mil. pounds	Baseline	567	552	536	521	509	494	480	468	458	509
	mil. pounds	Decision	0	-1	-1	-1	-1	-1	-1	-1	-1	-1
	percent	Decision	-0.07	-0.11	-0.13	-0.15	-0.17	-0.18	-0.18	-0.19	-0.19	-0.15

Table 14. Federal Order Cash Receipts

	Units	Scenario	2008	2009	2010	2011	2012	2013	2014	2015	2016	9 Yr. Avg.
Class I	mil. $	Baseline	6,195	6,407	6,569	6,728	6,843	6,831	6,902	6,912	6,939	6,703
	mil. $	Decision	-102	-77	-62	-53	-49	-47	-46	-46	-46	-59
	percent	Decision	-1.64	-1.20	-0.95	-0.79	-0.71	-0.68	-0.66	-0.66	-0.66	-0.87
Class II	mil. $	Baseline	3,541	3,753	3,959	4,085	4,182	4,283	4,372	4,449	4,568	4,133
	mil. $	Decision	-6	-4	-5	-3	-3	-3	-2	-1	-2	-3
	percent	Decision	-0.17	-0.11	-0.11	-0.08	-0.07	-0.07	-0.05	-0.03	-0.04	-0.08
Class III	mil. $	Baseline	6,677	7,142	7,486	7,789	8,021	8,131	8,313	8,420	8,564	7,838
	mil. $	Decision	-122	-99	-86	-78	-74	-74	-73	-73	-74	-84
	percent	Decision	-1.83	-1.38	-1.15	-1.00	-0.93	-0.91	-0.88	-0.87	-0.87	-1.07
Class IV	mil. $	Baseline	1,970	1,967	2,020	2,068	2,120	2,174	2,234	2,290	2,362	2,134
	mil. $	Decision	-14	-16	-18	-19	-20	-21	-21	-21	-23	-19
	percent	Decision	-0.73	-0.80	-0.91	-0.92	-0.93	-0.96	-0.95	-0.93	-0.96	-0.90
Total	mil. $	Baseline	18,383	19,268	20,034	20,671	21,167	21,420	21,820	22,071	22,434	20,808
	mil. $	Decision	-244	-196	-172	-154	-146	-144	-142	-141	-145	-165
	percent	Decision	-1.33	-1.02	-0.86	-0.75	-0.69	-0.67	-0.65	-0.64	-0.64	-0.79

Table 15. Net Government Removals of Nonfat Dry Milk Through the Milk Price Support Program (MPSP)

	Units	Scenario	2008	2009	2010	2011	2012	2013	2014	2015	2016	9 Yr. Avg.
NDM Net	mil. pounds	Baseline	7	4	2	1	1	1	1	1	1	2
Govt. Removals[1]	mil. pounds	Decision	-1	-1	0	0	0	0	0	0	0	0
MPSP Outlays[2]	mil. $	Decision	-1	-1	0	0	0	0	0	0	0	0
Total Govt. Outlays	mil. $	Decision	-1	-1	0	0	0	0	0	0	0	0

[1] Net government removals equals support price purchases minus unrestricted sales.

[2] MPSP outlays are not projected in the model. The change is computed by multiplying NDM net removal quantities by the NDM support price of $0.80. No attempt is made to estimate changes in storage, handling, transportation, processing, and packaging costs.

Government Outlays

With decreased milk production, manufacturing supplies tighten and in turn result in higher product prices. These elevated product prices are the reason that government removals under the Milk Price Support Program (MPSP) do not rise above baseline levels even though milk prices fall slightly below baseline over the projection period (Table 15). Government removals of nonfat dry milk fall by 1 million pounds in the first two years of the projection period, but return to baseline levels in 2010. Government outlays similarly fall by $1 million in the first two years before returning to baseline levels. (It is assumed that current MPSP make allowances remain in effect for the nine-year projection period.[3])

Summary of Results

The impacts of the proposed changes to the Class III and Class IV pricing formulas contained in the tentative partial final decision are summarized as changes from the USDA baseline on an annual basis and as a nine-year average change from 2008-2016. Impacts on the Federal order system are considered to be in the context of the broader U.S. market for milk and dairy products.

Producers. The U.S all-milk price falls an average $0.06 per cwt (0.39 percent) from a baseline level of $16.22 per cwt over the nine-year projection period. The average Federal order minimum blend price at test averages $0.11 per cwt (0.68 percent) below the baseline level of $16.43 per cwt. The lower milk prices result in a tightening of production. In turn, Federal order marketings fall an average 145 million pounds (0.11 percent) below the baseline average of 126.5 billion pounds. Federal order cash receipts decrease an average $165 million (0.79 percent) from the $20.8 billion baseline receipts. U.S. marketings average 240 million pounds (0.13 percent) per year below the baseline average of 187.8 billion pounds. The lower marketings coupled with lower farm milk prices result in an average decline of $156 million (0.51 percent) in producer revenue from the baseline average of $30.4 billion.

Milk Manufacturers and Processors. Increases to the make allowances in Federal order minimum price formulas are advantageous for dairy product manufacturers. Average wholesale prices over the projection period exceed baseline by the following: cheddar cheese by $0.0176 per pound (1.14 percent), butter by $0.0346 per pound (1.89 percent), nonfat dry milk by $0.0090 per pound (0.88 percent), and dry whey by $0.0034 per pound (0.94 percent).

In spite of the higher product prices, the make allowance changes are substantial enough that the nine-year average component prices fall from baseline levels. The changes are as follows: butterfat decreases by $0.0014 per pound (0.07 percent), protein decreases by $0.0451 per pound (1.96 percent), nonfat solids decreases by $0.0018 per pound (0.22 percent) and the other solids price by decreases by $0.0001 per pound (0.05 percent). Lower component prices are carried through to lower skim milk pricing factors. The Class III skim price falls an average $0.14 per cwt (1.72 percent) from a baseline average level of $8.16 per cwt and remains the Class I price mover.

[3] USDA Farm Service Agency Milk Price Support Program Fact Sheet (July 2004); accessed at http://www.fsa.usda.gov/Internet/FSA_File/2004milkpstable.pdf.

Consumers. The retail price of fluid milk is expected to decrease an average of $0.0094 per gallon (0.27 percent) from the baseline average price of $3.4135 over the nine-year projection period due to the lower Class I price. Consumers respond, albeit modestly, to the decreased prices as evidenced by the average 32 million pound (0.07 percent) increase in Class I marketings from a baseline average of 45 billion pounds over the projection period. Class II marketings increase overall, indicating an increase in consumption of soft products consistent with the slight decline in Class II prices. Consumer demand for hard manufactured dairy products is more elastic than for fluid milk and soft products, that is, consumers are more responsive to changes in price. It is projected that consumers will face higher prices for hard manufactured dairy products such as cheese, butter and nonfat dry milk and as a result, Class III and Class IV marketings fall from baseline levels.

Government Outlays. With the expiration of the MILC program, and no activity under DEIP, any change to government outlays occurs through MPSP purchases. Baseline level prices are high enough that few government purchases are expected. Under the proposed changes, removals change only slightly at the beginning of the projection period; remaining unchanged in from baseline in the long run projection.

Conclusions

The proposed changes to Class III and Class IV pricing formulas result in lower Federal order prices as well as higher manufactured product prices. Thus, the gap between the price of milk and the wholesale prices received by dairy product manufacturers widens. At the same time, milk producers face lower prices and respond by cutting back on production, leading to lower marketings and producer revenues.

The decrease in the Federal minimum price for Class I milk is passed on to consumers in the form of a slightly lower retail price for fluid milk which increases consumption. However, tighter milk supply bolsters manufactured product prices and in turn lowers consumption of cheese, butter, and nonfat dry milk. Class I and Class II marketings increase, but not enough to counteract the lower prices, allowing average receipts to fall across all classes. Though prices for Class III and Class IV milk decrease under the proposed changes, the decreased consumption of the associated dairy products and the increase in Class I and Class II product consumption causes a shift in dairy product allocation.

Appendix

Current Price Formulas

Note: Milk prices are per 100 pounds or cwt., rounded to the nearest cent.
Component prices are per pound, rounded to nearest one-hundredth cent.
Cheese, dry whey, butter, and nonfat dry milk prices are weighted monthly averages of weekly NASS survey prices, rounded to the nearest one-hundredth cent.

Class I:
Class I Price = (Class I skim milk price x 0.965) + (Class I butterfat price x 3.5).
Class I Skim Milk Price = Higher of advanced Class III or IV skim milk pricing factors + applicable Class I differential.
Class I Butterfat Price = Advanced butterfat pricing factor+ (applicable Class I differential divided by 100).
Note: Advanced pricing factors are computed using applicable price formulas listed below, except that product price averages are for two weeks.

Class II:
Class II Price = (Class II skim milk price x 0.965) + (Class II butterfat price x 3.5).
Class II Skim Milk Price = Advanced Class IV skim milk pricing factor + $0.70.
Class II Butterfat Price = Butterfat price + $0.007.
Class II Nonfat Solids Price = Class II skim milk price divided by 9.

Class III:
Class III Price = (Class III skim milk price x 0.965) + (Butterfat price x 3.5).
Class III Skim Milk Price = (Protein price x 3.1) + (Other solids price x 5.9).
Protein Price = ((Cheese price – 0.1682) x 1.383) + ((((Cheese price – 0.1682) x 1.572) - Butterfat price x 0.9) x 1.17).
Other Solids Price = (Dry whey price – 0.1956) times 1.03.
Butterfat Price = (Butter price – 0.1202) times 1.20.

Class IV:
Class IV Price = (Class IV skim milk price x 0.965) + (Butterfat price x 3.5).
Class IV Skim Milk Price = Nonfat solids price times 9.
Nonfat Solids Price = (Nonfat dry milk price - 0.157) times 0.99.
Butterfat Price = See Class III.
Somatic Cell Adjustment Rate = Cheese price x 0.0005, rounded to fifth decimal place. Rate is per 1,000 somatic cell count difference from 350,000