USDA Agricultural Marketing Service (AMS)

Economic Analysis
Class III and IV Make Allowances
Tentative Final Decision

November 2006

Economic Analysis Staff

Dairy Programs

Office of the Chief Economist

Introduction

The Department has conducted an analysis in order to assist the industry in considering the effects of increasing manufacturing allowances, commonly referred to as "make allowances." While the proposal seeks to amend the product pricing formulas used to price Class III or Class IV milk pooled under Federal milk marketing orders, changes in these formulas also would affect the prices of Class I and Class II milk pooled on Federal milk marketing orders.

Current make allowances used in Class III and Class IV price formulas for all Federal orders are based on three sources: (1) *1998 Dairy Product Plant Costs, USDA/Rural Business Cooperative Service Technical Assistance Project*, (2) *Weighted Average Manufacturing Costs for Butter, Nonfat Powder, and Cheddar Cheese, January 1997 to April 1999*, California Department of Food and Agriculture; and (3) *Dry Whey Total Costs of Manufacturing, 1999*, National Cheese Institute sponsored survey. The make allowances for cheese, butter, and nonfat dry milk (NDM) are based on the data from the first two sources and have been in effect since January 2001. The dry whey make allowance is based on data from the third source and it has been in effect since April 2003.

The proposed make allowances for this tentative final decision 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 (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 2004, Amended January 2006 (CDFA study). The Cornell study includes plants outside of California, and the CDFA includes costs of plants in California. The most recent data from the CDFA study covers costs for the 2004 calendar year. The Cornell study covers costs over 12-month time periods that vary from one plant to another: 63 percent from the period July 2004 through July 2005, 21 percent from earlier 12-month periods, and 16 percent from more recent 12-month periods.

To calculate proposed make allowances for cheese and butter, weighted average costs from all plants surveyed for both studies are used. For NDM, the weighted average cost for all plants surveyed is used from the Cornell study while the weighted average costs of medium-cost plants is used from the CDFA study. These weighted averaged costs are then weighted by 2005 total product volumes[1] from California and the U.S. outside of California to estimate weighted average U.S. costs before sales and administrative costs (Table 1). For whey, only the weighted average cost from the Cornell study is used. All of the proposed make allowances include sales and administrative costs of $0.0015 per pound.

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[1] The data source for total product volumes is USDA National Agricultural Statistics Service.

Table 1. Calculation of Proposed Make Allowances

Cheese	
Weighted average cost, Cheddar cheese, $/pound:	
CDFA Study [1]	0.1769
Cornell Study [2]	0.1638
2005 volume, American cheese [3]	
California	
Cheddar	522,624
Colby and Monterrey Jack	332,080
Total American	854,704
U.S. other than California	
Cheddar	2,529,791
Colby and Monterrey Jack	428,455
Total American	2,958,246
U.S.	
Cheddar	3,052,415
Colby and Monterrey Jack	760,535
Total American	3,812,950
Weighted average cost per pound:	
Before sales and administrative costs	0.1667
Sales and administrative costs	0.0015
Proposed make allowance	0.1682

NDM	
Weighted average cost, $/pound:	
CDFA Study--medium cost plants	0.1733
Cornell Study [4]	0.1423
2005 volume, 1000 pounds:	
California	506,452
U.S. other than California	679,652
U.S.	1,186,104
Weighted average cost per pound	
Before sales and administrative costs	0.1555
Sales and administrative costs	0.0015
Proposed make allowance	0.1570

Butter	
Weighted average cost, $/pound:	
CDFA Study	0.1368
Cornell Study	0.1108
2005 volume, 1000 pounds:	
California	407,872
U.S. other than California	939,355
U.S.	1,347,227
Weighted average cost per pound:	
Before sales and administrative costs	0.1187
Sales and administrative costs	0.0015
Proposed make allowance	0.1202

Whey	
Weighted average cost, $/pound:	
Cornell Study	0.1941
Sales and administrative costs	0.0015
Proposed make allowance	0.1956

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[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 2004, Amended January 2006

[2] Cost of Processing in Cheese, Whey, Butter, and Nonfat Dry Milk Plants, by Mark Stephenson, Cornell Program on Dairy Markets and Policy, September 2006

[3] Source for all volumes: USDA, National Agricultural Statistics Service, 2005 values

[4] The text of the Cornell study indicates that the weighted average nonfat dry milk manufacturing cost is $0.1410 per pound. This was corrected to $0.1423 at the hearing.

Economic Analysis Framework

Impacts of increasing make allowances were measured as changes from the USDA Agricultural Baseline Projections to 2015 (OCE-2006-1, http://www.usda.gov/oce/commodity/ag_baseline.htm). The analysis is accomplished using an econometric model of the dairy industry maintained by Dairy Programs. 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 be utilized to the maximum extent allowed beginning in the 2006/07 fiscal year; (3) the Milk Income Loss Contract (MILC) program will continue through September 2007;[2] and (4) the Federal Milk Marketing Order Program will continue unchanged. For the proposed make allowances, this analysis maintains the first three assumptions as unchanged. The only changes to the Federal Milk Marketing Order Program are those that are brought about by the changes in make allowances. Since the model is an annual model, a simplifying assumption is made that the make allowance changes become effective January 1, 2007.

During the last five years, milk marketings under the Federal order milk program have been about 68 percent of total U.S. milk marketings. Marketings under the Federal order milk program have accounted for about 61 percent of all milk used for manufacturing. Given the prominence of Federal order marketings in the U.S. dairy manufacturing industry, prices paid for manufactured milk under Federal orders are consistent with the value of milk for manufacturing in the rest of the United States. Similarly, the fluid prices in non-Federal order markets reflect fluid prices established as Federal order minimum Class I prices. U.S. milk marketings in this analysis are estimated as a function of the U.S. all-milk price. For the USDA baseline period, the Federal order share of total U.S. milk marketings is estimated as a proportion from recent data.

The econometric model used in this analysis includes demands for fluid milk products and manufactured dairy products. The demands for fluid milk products and for manufactured dairy products are functions of price, per capita consumption, and population. Retail prices of fluid milk and Class II soft manufactured products are assumed to respond penny for penny to changes in the milk cost of these products. Wholesale and retail margins are assumed unchanged from the USDA baseline for all proposals analyzed. Wholesale prices for cheese, butter, nonfat dry milk, and dry whey reflect supply and demand conditions for each of these products. The milk supply for manufacturing these hard products is the result of milk marketings minus the volumes demanded for Class I and Class II products. The remaining volume is allocated to Class III and Class IV according to returns to manufacturing in each class.

The model and Federal order price formulas use national manufactured dairy product prices to establish the Class prices. Class prices, quantities of milk marketed through the Federal order system, a blend price, and Federal order cash receipts are projected.

The quantity of milk supplied is a function of the all-milk price, feed prices, cow slaughter prices, and trend. The all-milk price, i.e., the average price paid for milk on an f.o.b. plants basis, is estimated as a function of the wholesale prices for dairy products and Federal order prices. The relationship implicitly reflects average manufacturing costs, over-order payments for milk, and

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[2] Dairy producers are not eligible to choose September 2007 as a month for which MILC payments are to be applied.

prices paid for milk outside of the Federal order system. For more details concerning the model, see documentation for the *Dairy Programs National Econometric Model* at http://www.ams.usda.gov/dairy/proposals/classIII_IV_make_all.htm.

Static Results

Table 2 displays static changes in component prices and Federal order minimum milk prices with the proposed make allowances. Cheese has the smallest make allowance change (1.9 percent). The largest make allowance change is for whey powder (23 percent). Changes in component prices fall by similar magnitudes to the increases in the make allowances. The first few months of the program would likely reflect the impacts similar to those displayed in the table. Changes are simply computed from the Federal order pricing formulas. (See Appendix for Federal order price formulas.) The calculations do not, however, take into account the changes in the milk supply and product allocation that result from, and in turn impact, changes in prices.

Table 2. Static Impact [1] of Recommended Make Allowances on Class and Component Prices

Make allowances ($/pound)

	Current	Recommended	Change	Percent Change
Cheese	0.1650	0.1682	0.0032	1.9
Butter	0.1150	0.1202	0.0052	4.5
NDM	0.1400	0.1570	0.0170	12.1
Whey Powder	0.1590	0.1956	0.0366	23.0

Change in component values assuming no supply and demand responses ($/pound)

Protein	-0.0037
Butterfat	-0.0062
Nonfat solids	-0.0168
Other solids	-0.0377

Change in Federal order milk prices assuming no supply and demand responses ($/cwt.)

Class III skim milk	-0.23
Class IV skim milk	-0.15
Class III price at 3.5% butterfat	-0.25
Class IV price at 3.5% butterfat	-0.17

[1] The impacts shown in this table do not account for supply and demand responses and product allocation changes that occur due to price changes.

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Model Results

All-Milk Price and Milk Production

The proposed increases in the make allowances result in lower prices to dairy farmers (Table 3). The effect on the all-milk price is greatest in the first year, a reduction of $0.11 (0.78 percent) below the baseline level of $14.56 per hundredweight (cwt.). The impact is mitigated slightly by a $0.01 per cwt. increase in the average MILC payment that year. As the projection period progresses, the impact to the all-milk price lessens each year, reaching a reduction of $0.02 per cwt. (0.16 percent) below the baseline in 2014 and 2015. The impact to producer revenue is greatest in the first year with an impact of $191 million (0.71 percent) below the baseline level. The impact to producer revenue lessens thereafter, averaging $125 million (0.44 percent) below the baseline for the projection period. The impacts are smaller than may be expected from a static analysis (Table 2) because dairy product prices rise (Table 5) due to a reduction in the milk supply (Table 4).

Dairy producers generally respond to lower farm-gate milk prices by lowering milk production, both in terms of cow numbers and yield per cow. In the model, cow numbers are impacted in the first year of a change in milk prices while yield per cow has a lagged response (Table 4). In the first year, cow numbers fall 3 thousand (0.03 percent) below the baseline level. Cow numbers decline at a decreasing marginal rate below the baseline, reaching a total reduction of 8 thousand cows (0.09 percent) by 2012. There is no response in yield per cow for the first year due to the lagged response in the model. Yield per cow is 3 pounds (0.01 percent) per year below the baseline level in 2008 and declines relative to the baseline at a decreasing marginal rate, reaching a decline of 12 pounds (0.05 percent) by the end of the projection period. In the first year, milk production falls by 51 million pounds (0.03 percent) below the baseline level. Milk production declines at a decreasing marginal rate below the baseline level each year, reaching a reduction of 286 million pounds (0.14 percent) by the end of the projection period.

Product Prices

A tighter milk supply results in higher dairy product prices (Table 5). Prices rise for cheese, butter, nonfat dry milk, and whey. The greatest price impact is in the butter market. Over the projection period, the butter price rises by an average of about $0.0305 per pound (1.99 percent) above baseline levels. This contrasts with smaller average changes, less than one percent, in the other prices over the projection period: cheese, $0.0199 (0.82 percent); nonfat dry milk, $0.0012 (0.14 percent); and whey, $0.0015 (0.56 percent). The difference in the price response of butter compared to the other commodities can be attributed to its very inelastic demand. A relatively small reduction in the milk supply available for butter production results in a relatively large change in price.

In contrast to dairy product prices, retail milk prices fall slightly. This is due to a reduction in Federal order Class I prices that accompany the increase in make allowances (Table 9). For purposes of this analysis, the simplifying assumption is made that changes in Class I prices at test are passed on to consumers in constant margins. The change in retail prices very small, averaging $0.0137 per gallon over the projection period.

Table 3. All-Milk Price and Producer Revenue

	Units		2007	2008	2009	2010	2011	2012	2013	2014	2015	9 Yr. Avg.
All Milk	$/cwt.	Baseline	14.56	14.55	14.47	14.48	14.69	14.85	14.85	15.19	15.41	14.79
	"	Impact	-0.11	-0.08	-0.07	-0.05	-0.04	-0.04	-0.03	-0.02	-0.02	-0.05
	percent	Impact	-0.78	-0.56	-0.45	-0.35	-0.28	-0.24	-0.21	-0.16	-0.16	-0.35
Avg. MILC Payment (MILC payments/milk production)	mil. $	Baseline	0.10									
	"	Impact	0.01									
	percent	Impact	12.97									
Producer Revenue (including MILC)	mil. $	Baseline	26,861	27,113	27,239	27,570	28,248	28,890	29,047	29,960	30,634	28,396
	"	Impact	-191	-166	-156	-125	-111	-115	-98	-82	-84	-125
	percent	Impact	-0.71	-0.61	-0.57	-0.45	-0.39	-0.40	-0.34	-0.27	-0.27	-0.44

Table 4. Milk Production Variables

	Units		2007	2008	2009	2010	2011	2012	2013	2014	2015	9 Yr. Avg.
Milk Cows	1000s	Baseline	9,085	9,058	9,005	8,950	8,896	8,839	8,778	8,728	8,673	8,890
	"	Impact	-3	-4	-6	-7	-7	-8	-8	-8	-8	-6
	percent	Impact	-0.03	-0.05	-0.06	-0.07	-0.08	-0.09	-0.09	-0.09	-0.09	-0.07
Yield per Cow	Pounds	Baseline	20,266	20,660	20,995	21,351	21,696	22,079	22,341	22,655	22,966	21,668
	"	Impact	0	-3	-5	-7	-8	-9	-10	-11	-12	-7
	percent	Impact	0.00	-0.01	-0.02	-0.03	-0.04	-0.04	-0.05	-0.05	-0.05	-0.03
Milk Production	Mil. Pnds.	Baseline	184,123	187,147	189,048	191,102	192,997	195,146	196,103	197,738	199,193	192,511
	"	Impact	-51	-117	-167	-204	-231	-252	-267	-278	-286	-206
	percent	Impact	-0.03	-0.06	-0.09	-0.11	-0.12	-0.13	-0.14	-0.14	-0.14	-0.11
Farm Use	Mil. Pnds.	Baseline	900	800	800	700	700	600	500	500	400	656
Marketings	Mil. Pnds.	Baseline	183,223	186,347	188,248	190,402	192,297	194,546	195,603	197,238	198,793	191,855
	"	Impact	-51	-117	-167	-204	-231	-252	-267	-278	-286	-206
	percent	Impact	-0.03	-0.06	-0.09	-0.11	-0.12	-0.13	-0.14	-0.14	-0.14	-0.11

Table 5. Product Prices

	Units		2007	2008	2009	2010	2011	2012	2013	2014	2015	9 Yr. Avg.
Cheddar cheese	$/pound	Baseline	1.4665	1.4747	1.4407	1.4412	1.4532	1.4582	1.4436	1.4732	1.4832	1.4594
	"	Impact	0.0049	0.0084	0.0103	0.0119	0.0131	0.0138	0.0143	0.0152	0.0153	0.0119
	percent	Impact %	0.34	0.57	0.72	0.83	0.90	0.95	0.99	1.03	1.03	0.82
Butter	$/pound	Baseline	1.3809	1.3896	1.4898	1.5184	1.5574	1.5964	1.6049	1.5975	1.6578	1.5325
	"	Impact	0.0206	0.0266	0.0299	0.0317	0.0325	0.0328	0.0336	0.0339	0.0326	0.0305
	percent	Impact %	1.49	1.91	2.01	2.09	2.09	2.05	2.09	2.12	1.97	1.99
Nonfat dry milk	$/pound	Baseline	0.8904	0.8603	0.8304	0.8366	0.8341	0.8310	0.8287	0.8385	0.8492	0.8444
	"	Impact	0.0014	0.0011	0.0008	0.0011	0.0012	0.0012	0.0011	0.0014	0.0017	0.0012
	percent	Impact %	0.15	0.13	0.10	0.14	0.14	0.14	0.13	0.16	0.20	0.14
Dry whey	$/pound	Baseline	0.2531	0.2483	0.2492	0.2602	0.2739	0.2814	0.2923	0.3086	0.3079	0.2750
	"	Impact	0.0008	0.0013	0.0015	0.0017	0.0017	0.0017	0.0017	0.0018	0.0016	0.0015
	percent	Impact %	0.31	0.52	0.61	0.64	0.64	0.61	0.59	0.57	0.54	0.56
Retail fluid milk [1]	$/gallon	Impact	-0.0188	-0.0163	-0.0149	-0.0137	-0.0128	-0.0122	-0.0120	-0.0112	-0.0110	-0.0137

[1] Retail fluid milk prices are not projected in the model. Projected impacts are calculated by multiplying the Class I price per pound at test by 8.62 pounds of milk per gallon.

<u>Federal Order Component Prices, Pricing Factors, and Class Prices at 3.5 Percent Butterfat</u>

Impacts to Federal order component prices and pricing factors are displayed in Table 6. The model impacts to Federal order component prices differ significantly from those of the static impacts as displayed in Table 2. The differences are due to the changes in product prices displayed in Table 5.

The relationship between the butterfat price and the protein price is notable. In calculating the butterfat price, the increase in the butter price is great enough to more than offset the increase in the butter make allowance, resulting in an average $0.0303 per pound (1.78 percent) increase above the baseline over the projection period. The impact to the protein price is a result of the change in the cheese make allowance, the impact to the cheese price, and the impact to the butterfat price. An increase in the cheese make allowance has the effect of lowering the protein price while an increase in the cheese price has the effect of raising the protein price. Since the butterfat price in inversely related to the protein price in the Federal order pricing formula, an increase in the butterfat price has the effect of lowering the protein price. Model results indicate that the relative effects of these factors change over time. As the cheese price rises in comparison to the baseline over time, the protein price rises. In the first year, the protein price falls below the baseline by $0.0139 per pound (0.54 percent). By the end of the projection period the combined effects result in an increase in the protein price of $0.0044 (0.19 percent) above the baseline.

Changes in component prices associated with dry products are greater on a percentage basis than changes in the butterfat and protein prices. The change in the nonfat solids price varies slightly over the projection period, averaging a decline of $0.0156 per pound (2.24 percent) below baseline levels. Of the component prices, the largest effect occurs for other solids, a decrease averaging $0.0361 (30.22 percent) below baseline levels.

Class III skim price is the mover for the Class I skim price over the projection period.[3] Accordingly, impacts to the two prices are identical, averaging $0.22 per cwt. below baseline levels over the projection period. The largest impact is in the first year, $0.26 below baseline with attenuation to $0.20 below baseline for the last two years. Since Class IV skim price is the mover for the Class II skim price, impacts for both prices are identical. Since the impact to nonfat solids price varies only slightly over time, the impact to Class II and IV skim prices rounds to a decrease of $0.14 below baseline levels over the entire projection period.

Reductions in Federal order component prices and pricing factors translate into reductions in Federal order class prices at 3.5 percent butterfat (Table 7). Reductions in Class I and III prices are greater than reductions in Class II and IV prices. For Class I and III, the effect is greatest in the first year with prices decreasing $0.19 per cwt. below the baseline level. Over the projection period, average Class I and III prices decrease $0.11 below baseline levels. For Class II and IV,

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[3] The price mover for Class I skim milk is actually the higher of the *advanced* Class III or IV skim milk pricing factor. Since the model is an annual model, no distinction is necessary between current pricing and advanced pricing for any of the pricing factors.

Table 6. Federal Order Component Prices and Pricing Factors

	Units		2007	2008	2009	2010	2011	2012	2013	2014	2015	9 Yr. Avg.
Butterfat	$/pnd.	Baseline	1.5191	1.5295	1.6498	1.6841	1.7309	1.7777	1.7879	1.7790	1.8514	1.7010
	"	Impact	0.0185	0.0257	0.0297	0.0318	0.0328	0.0331	0.0341	0.0345	0.0329	0.0303
	percent	Impact	1.22	1.68	1.80	1.89	1.89	1.86	1.91	1.94	1.77	1.78
Protein	$/pnd.	Baseline	2.5943	2.6098	2.3733	2.3389	2.3284	2.2950	2.2375	2.3422	2.2981	2.3797
	"	Impact	-0.0139	-0.0103	-0.0082	-0.0053	-0.0026	-0.0007	-0.0002	0.0022	0.0044	-0.0038
	percent	Impact	-0.54	-0.39	-0.35	-0.23	-0.11	-0.03	-0.01	0.10	0.19	-0.16
Nonfat Solids	$/pnd.	Baseline	0.7429	0.7131	0.6835	0.6896	0.6872	0.6841	0.6818	0.6916	0.7021	0.6973
	"	Impact	-0.0155	-0.0157	-0.0160	-0.0157	-0.0156	-0.0157	-0.0157	-0.0155	-0.0152	-0.0156
	percent	Impact	-2.08	-2.21	-2.34	-2.28	-2.28	-2.29	-2.31	-2.24	-2.16	-2.24
Other Solids	$/pnd.	Baseline	0.0970	0.0920	0.0929	0.1042	0.1183	0.1261	0.1373	0.1541	0.1534	0.1195
	"	Impact	-0.0369	-0.0364	-0.0361	-0.0360	-0.0359	-0.0359	-0.0359	-0.0359	-0.0360	-0.0361
	percent	Impact	-38.05	-39.53	-38.89	-34.52	-30.34	-28.49	-26.17	-23.28	-23.47	-30.22
Class I Skim	$/cwt.	Baseline	11.32	11.34	10.62	10.58	10.63	10.57	10.46	10.88	10.74	10.79
	"	Impact	-0.26	-0.25	-0.24	-0.23	-0.22	-0.21	-0.21	-0.20	-0.20	-0.22
	percent	Impact	-2.30	-2.17	-2.25	-2.16	-2.07	-2.03	-2.03	-1.88	-1.85	-2.08
Class II Skim	$/cwt.	Baseline	7.39	7.12	6.85	6.91	6.88	6.86	6.84	6.92	7.02	6.98
	"	Impact	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14
	percent	Impact	-1.89	-1.99	-2.10	-2.04	-2.04	-2.06	-2.07	-2.01	-1.95	-2.02
Class III Skim	$/cwt.	Baseline	8.61	8.63	7.91	7.87	7.92	7.86	7.75	8.17	8.03	8.08
	"	Impact	-0.26	-0.25	-0.24	-0.23	-0.22	-0.21	-0.21	-0.20	-0.20	-0.22
	percent	Impact	-3.03	-2.85	-3.02	-2.91	-2.78	-2.72	-2.75	-2.51	-2.48	-2.78
Class IV Skim	$/cwt.	Baseline	6.69	6.42	6.15	6.21	6.18	6.16	6.14	6.22	6.32	6.28
	"	Impact	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14	-0.14
	percent	Impact	-2.08	-2.21	-2.34	-2.28	-2.28	-2.29	-2.31	-2.24	-2.16	-2.24

Table 7. Federal Order Milk Prices at 3.5 Percent Butterfat

	Units		2007	2008	2009	2010	2011	2012	2013	2014	2015	9 Yr. Avg.
Class I	$/cwt.	Baseline	16.34	16.39	16.11	16.19	16.41	16.52	16.44	16.82	16.94	16.46
	"	Impact	-0.19	-0.15	-0.13	-0.11	-0.10	-0.09	-0.09	-0.08	-0.08	-0.11
	percent	Impact	-1.14	-0.90	-0.78	-0.68	-0.59	-0.55	-0.52	-0.46	-0.45	-0.67
Class II	$/cwt.	Baseline	12.47	12.25	12.41	12.58	12.73	12.86	12.88	12.93	13.28	12.71
	"	Impact	-0.07	-0.05	-0.04	-0.02	-0.02	-0.02	-0.02	-0.01	-0.02	-0.03
	percent	Impact	-0.56	-0.38	-0.28	-0.20	-0.17	-0.16	-0.13	-0.11	-0.13	-0.23
Class III	$/cwt.	Baseline	13.63	13.68	13.40	13.48	13.70	13.81	13.73	14.11	14.23	13.75
	"	Impact	-0.19	-0.15	-0.13	-0.11	-0.10	-0.09	-0.09	-0.08	-0.08	-0.11
	percent	Impact	-1.37	-1.08	-0.94	-0.81	-0.71	-0.66	-0.63	-0.55	-0.54	-0.81
Class IV	$/cwt.	Baseline	11.77	11.55	11.71	11.88	12.03	12.16	12.18	12.23	12.58	12.01
	"	Impact	-0.07	-0.05	-0.04	-0.02	-0.02	-0.02	-0.02	-0.01	-0.02	-0.03
	percent	Impact	-0.59	-0.41	-0.30	-0.21	-0.18	-0.17	-0.14	-0.11	-0.13	-0.25
Uniform at 3.5% BF	$/cwt.	Baseline	14.26	14.23	14.05	14.15	14.33	14.44	14.38	14.67	14.83	14.37
	"	Impact	-0.16	-0.12	-0.10	-0.09	-0.08	-0.07	-0.07	-0.06	-0.06	-0.09
	percent	Impact %	-1.10	-0.85	-0.72	-0.61	-0.53	-0.49	-0.46	-0.40	-0.40	-0.62

the greatest effect is also in the first year with prices decreasing $0.07 below the baseline level. Over the projection period, average Class II and IV prices decrease $0.03 below baseline levels. With the effects of the changes in Federal order class prices and Federal order marketings (Table 10), the average uniform price at 3.5 percent butterfat is reduced by $0.09 per cwt. (0.62 percent) over the projection period. The largest effect is in the first period, a reduction of $0.16 (1.10 percent).

Class Butterfat Tests and Federal Order Prices at Class Tests

The butterfat test of producer milk is assumed to be a constant in the model, 3.67 percent throughout the projection period. Butterfat tests for the four Federal order milk classes differ from one class to another due to the mix of products within each class (Table 8). For Class I, a simplifying assumption is made that the butterfat test remains at 2.044 percent over the projection period. For the other classes, the butterfat levels change over time due to the change in the proportions of products produced in each class. For example, the butterfat level of Class IV milk changes over time because the proportions of milk used for butter, nonfat dry milk, dry whole milk, and condensed milk change over time. Class II has the greatest butterfat test, with baseline levels averaging 8.160 percent over the projection period. This is followed by baseline levels of Class IV at 4.369 percent and Class III at 3.485 percent. With the proposed make allowance changes, the product allocation changes, resulting in very small changes in average Federal order class butterfat tests over the projection period: the change in the Class II butterfat percent rounds to 0.000, the Class III is butterfat percent decreases by 0.002, and the Class IV butterfat percent increases by 0.018.

Changes in Federal order milk prices at test (Table 9) differ notably from changes in Federal order milk prices at 3.5 percent butterfat (Table 7). All of the class prices at 3.5 percent butterfat fall throughout the projection period. At test, average Class I and III prices fall while average Class II and IV prices rise. These differences are due to the higher fat content of the Class II and IV product mixes (Table 8) and the differences in the magnitudes of component prices and pricing factors (Table 6). In contrast to class prices at 3.5 percent butterfat, for class prices at test there are not matching changes for Classes I and III or Classes II and IV. This is because Class I and II butterfat levels do not match the butterfat levels of their Class III and IV price movers.

Impacts to Federal order class prices at test change over time. For Class I, the largest impact, a decrease of $0.22 per cwt. (1.53 percent) occurs in the first year; the average decrease over the projection period is $0.16 (1.12 percent). For Class II, the smallest impact, an increase of $0.02 (0.12 percent) occurs in the first year; the average increase over the projection period is $0.12 (0.58 percent). For Class III, the largest impact, a decrease of $0.19 (1.38 percent) occurs in the first year; the average decrease over the projection period is $0.11 (0.83 percent). For Class IV, in the first year there is a decrease of $0.04 (0.28 percent), in the second year there is no change, and thereafter the impact is positive; the average increase over the projection period is $0.03 (0.20 percent).

Table 8. Average Class Butterfat Test

	Units		2007	2008	2009	2010	2011	2012	2013	2014	2015	9 Yr. Avg.
Class I	percent	Baseline	2.044	2.044	2.044	2.044	2.044	2.044	2.044	2.044	2.044	2.044
		Impact	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Class II	percent	Baseline	8.188	8.181	8.180	8.174	8.166	8.157	8.144	8.131	8.120	8.160
		Impact	0.000	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000
Class III	percent	Baseline	3.487	3.485	3.480	3.479	3.480	3.482	3.485	3.492	3.496	3.485
		Impact	-0.001	-0.001	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Class IV	percent	Baseline	4.501	4.464	4.478	4.443	4.396	4.351	4.304	4.218	4.164	4.369
		Impact	0.009	0.014	0.018	0.019	0.020	0.020	0.020	0.020	0.018	0.018

Table 9. Federal Order Milk Prices at Test

	Units		2007	2008	2009	2010	2011	2012	2013	2014	2015	9 Yr. Avg.
Class I	$/cwt.	Baseline	14.25	14.29	13.83	13.86	14.00	14.04	13.95	14.35	14.36	14.10
	"	Impact	-0.22	-0.19	-0.17	-0.16	-0.15	-0.14	-0.14	-0.13	-0.13	-0.16
	percent	Impact	-1.53	-1.32	-1.25	-1.15	-1.06	-1.01	-0.99	-0.91	-0.89	-1.12
Class II	$/cwt.	Baseline	19.28	19.10	19.84	20.16	20.51	20.85	20.90	20.88	21.54	20.34
	"	Impact	0.02	0.08	0.11	0.13	0.14	0.14	0.15	0.15	0.14	0.12
	percent	Impact	0.12	0.42	0.56	0.65	0.68	0.68	0.71	0.73	0.65	0.58
Class III	$/cwt.	Baseline	13.61	13.66	13.37	13.45	13.66	13.78	13.71	14.10	14.22	13.73
	"	Impact	-0.19	-0.15	-0.13	-0.11	-0.10	-0.09	-0.09	-0.08	-0.08	-0.11
	percent	Impact	-1.38	-1.10	-0.97	-0.84	-0.74	-0.69	-0.65	-0.57	-0.56	-0.83
Class IV	$/cwt.	Baseline	13.22	12.96	13.26	13.41	13.52	13.62	13.57	13.47	13.77	13.42
	"	Impact	-0.04	0.00	0.02	0.04	0.04	0.04	0.05	0.05	0.04	0.03
	percent	Impact	-0.28	0.00	0.18	0.29	0.32	0.32	0.35	0.34	0.29	0.20
Uniform	$/cwt.	Baseline	14.56	14.54	14.38	14.48	14.68	14.80	14.74	15.03	15.21	14.71
	"	Impact	-0.15	-0.12	-0.10	-0.08	-0.07	-0.06	-0.06	-0.05	-0.05	-0.08
	percent	Impact	-1.05	-0.79	-0.66	-0.55	-0.47	-0.43	-0.40	-0.34	-0.34	-0.55

The net effects of the changes in Federal order class prices at test and Federal order marketings (Table 10) result in reductions in the average uniform price at test by $0.08 (0.55 percent) over the projection period (Table 9). The largest effect is in the first period, a reduction of $0.15 (1.05 percent).

Federal Order Marketings and Cash Receipts

Changes in Federal order marketings are explained by supply and demand factors. Total Federal order marketings over the projection period (Table 10) follow a similar pattern to U.S. marketings (Table 4). Both decline at a decreasing marginal rate over the projection period. In the first year, total Federal order marketings fall by 30 million pounds (0.02 percent) below the baseline level. They decrease at a decreasing marginal rage below the baseline each year, reaching a reduction of 189 million pounds (0.14 percent) by the end of the projection period. Impacts for all of the class marketings generally change at a decreasing marginal rate over the projection period.

The increase in dairy product prices (Table 5) results in a decrease in the quantity of dairy products demanded and the accompanying decrease in milk demanded for dairy product manufacture. Class II marketings decrease by an average 26 million pounds (0.15 percent) over the projection period. Class III marketings decrease by an average 30 million pounds (0.06 percent) over the projection period. The largest decrease is in Class IV use, an average 97 million pounds (0.62 percent) over the projection period.

In contrast to the reduction in milk used for manufacturing purposes, there is a small increase Class I use over the projection period. This increase is due to the increase in quantity demanded that accompanies the reduction in the Federal order Class I price (Table 9). The largest increase in Class I marketings, 25 million pounds (0.05 percent) occurs in the first year; the average increase in Class I marketings over the projection period is 17 million pounds (0.04 percent).

Total Federal order cash receipts decrease by an average of $125 million per year below baseline levels over the projection period (Table 11). The greatest impact to total Federal order cash receipts, a decrease of $195 million (1.07 percent) below the baseline level, occurs in the first year. Class I cash receipts decrease by an average of $70 million (1.09 percent) per year below baseline levels over the projection period. The small increase in Class I marketings (Table 10) is not sufficient to offset the effects of the Class I price reduction (Table 9). Class II cash receipts increase by an average of $16 million per year (0.44 percent) above baseline levels. With the high fat level in Class II products (Table 8), the increase in the Class II price more than offsets the effects of the decrease in Class II marketings. In the case of Class III cash receipts, there is both a decrease in marketings and price. Class III cash receipts decrease by an average $62 million (0.88 percent) below baseline levels. For Class IV receipts, the decrease in marketings more than offsets the small average increase in price, resulting in an average decrease of $9 million (0.41 percent) per year below baseline levels.

Table 10. Federal Order Marketings

	Units		2007	2008	2009	2010	2011	2012	2013	2014	2015	9 Yr. Avg.
Class I	mil. pnds.	Baseline	45,723	45,884	45,846	45,873	45,879	46,015	45,911	45,873	45,870	45,875
	"	Impact	25	21	19	17	16	15	14	13	13	17
	percent	Impact	0.05	0.05	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.04
Class II	mil. pnds.	Baseline	16,724	17,000	17,048	17,219	17,405	17,642	17,859	18,151	18,356	17,489
	"	Impact	-5	-16	-22	-27	-30	-31	-33	-35	-34	-26
	percent	Impact	-0.03	-0.09	-0.13	-0.16	-0.17	-0.18	-0.19	-0.19	-0.19	-0.15
Class III	mil. pnds.	Baseline	47,811	48,990	49,928	50,683	51,337	52,086	52,649	53,180	53,704	51,152
	"	Impact	-8	-15	-21	-26	-32	-36	-40	-44	-48	-30
	percent	Impact	-0.02	-0.03	-0.04	-0.05	-0.06	-0.07	-0.08	-0.08	-0.09	-0.06
Class IV	mil. pnds.	Baseline	14,670	14,987	15,116	15,497	15,829	16,136	16,073	16,333	16,607	15,694
	"	Impact	-42	-67	-87	-100	-108	-115	-118	-118	-120	-97
	percent	Impact	-0.29	-0.45	-0.58	-0.64	-0.68	-0.71	-0.73	-0.72	-0.72	-0.62
Total	mil. pnds.	Baseline	124,928	126,861	127,938	129,272	130,450	131,879	132,493	133,536	134,538	130,211
	"	Impact	-30	-76	-111	-136	-153	-167	-177	-184	-189	-136
	percent	Impact	-0.02	-0.06	-0.09	-0.11	-0.12	-0.13	-0.13	-0.14	-0.14	-0.10

Table 11. Federal Order Cash Receipts

	Units		2007	2008	2009	2010	2011	2012	2013	2014	2015	9 Yr. Avg.
Class I	mil. $	Baseline	6,517	6,558	6,339	6,357	6,424	6,461	6,406	6,582	6,587	6,470
	"	Impact	-96	-84	-77	-71	-66	-63	-62	-58	-57	-70
	percent	Impact	-1.47	-1.28	-1.21	-1.11	-1.03	-0.98	-0.96	-0.88	-0.86	-1.09
Class II	mil. $	Baseline	3,224	3,248	3,383	3,472	3,570	3,679	3,732	3,790	3,954	3,561
	"	Impact	3	11	15	17	18	18	19	20	18	16
	percent	Impact	0.10	0.33	0.43	0.49	0.51	0.50	0.52	0.53	0.47	0.44
Class III	mil. $	Baseline	6,508	6,693	6,676	6,817	7,015	7,175	7,217	7,497	7,637	7,026
	"	Impact	-91	-76	-68	-61	-56	-54	-53	-49	-50	-62
	percent	Impact	-1.40	-1.13	-1.01	-0.89	-0.80	-0.75	-0.73	-0.65	-0.65	-0.88
Class IV	mil. $	Baseline	1,940	1,942	2,005	2,079	2,140	2,198	2,181	2,199	2,286	2,108
	"	Impact	-11	-9	-8	-7	-8	-9	-8	-8	-10	-9
	percent	Impact	-0.56	-0.45	-0.40	-0.36	-0.36	-0.39	-0.39	-0.38	-0.44	-0.41
Total	mil. $	Baseline	18,188	18,441	18,403	18,724	19,150	19,513	19,535	20,069	20,464	19,165
	"	Impact	-195	-157	-138	-122	-112	-108	-103	-95	-98	-125
	percent	Impact %	-1.07	-0.85	-0.75	-0.65	-0.58	-0.55	-0.53	-0.47	-0.48	-0.65

<u>Government Outlays</u>

In 2007, Class I price at 3.5 percent butterfat fall by $0.19 per cwt. below the baseline level. This includes the Class I price at Boston (Table 12). The model takes this price change into account along with an estimate of the proportion of milk production that receives MILC payments, variation of monthly prices about the average Class I price at Boston, and the proportion of the year (8 of 12 months) that the program is scheduled to remain effective. With lower milk prices, MILC payments increase by $25 million (12.94 percent) above the baseline level. This impact rounds to about $0.01 per cwt. averaged over all of the milk production (Table 3).

With an increase in Federal order make allowances, milk production declines, dairy product prices increase, and government removals decrease relative to baseline levels. The dairy industry experiences a decrease in government removals at the same time it experiences a decrease in milk prices. The analysis assumes that current MPSP make allowances will remain in effect throughout the projection period.[4] Over the projection period government removals of NDM decrease by an average of 9 million pounds (2.95 percent) per year due to the increase in the NDM price (Table 5). This reduces government outlays by an average $7 million per year over the projection period.[5] In the first year, there is no change because a baseline assumption is made that government removals are floored at fully-funded DEIP levels.

With the first year increase for the MILC and the subsequent years of decreased MPSP outlays, the net effect over the projection period is a reduction in government outlays averaging $4 million per year.

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[4] USDA Farm Service Agency uses make allowances for the MPSP that are similar to those used for the Federal Milk Marketing order program. For more information, see http://www.fsa.usda.gov/Internet/FSA_File/mpsp04.pdf.
[5] Changes in government outlays are computed by multiplying the change in net government removals by the support price of $0.80 per pound for NDM. The changes do not account for storage, handling, transportation, processing, or packaging.

Table 12. Milk Income Loss Contract (MILC) Payments and Net Government Removals of Nonfat Dry Milk Through the Milk Price Support Program (MPSP)

	Units		2007	2008	2009	2010	2011	2012	2013	2014	2015	9 Yr. Avg.
Class I Price at Boston (3.5 percent butterfat)	$/cwt.	Baseline	16.34									
	"	Impact	-0.19									
	percent	Impact	-0.01									
MILC Payments	mil. $	Baseline	190									
	"	Impact	25									
	percent	Impact	12.94									
NDM Net	mil. pnds.	Baseline	145	151	319	376	381	376	338	302	224	290
Govt. Removals [1]	"	Impact	0	-5	-8	-10	-11	-12	-12	-11	-10	-9
	percent	Impact	0.00	-3.06	-2.66	-2.55	-2.84	-3.08	-3.48	-3.54	-4.28	-2.95
MPSP Outlays [2]	mil. $	Impact	0	-4	-7	-8	-9	-9	-9	-9	-8	-7
Total Govt. Outlays	mil. $	Impact	25	-4	-7	-8	-9	-9	-9	-9	-8	-4

[1] Net government removals equals support price purchases plus Dairy Export Incentive Program (DEIP) removals minus unrestricted sales. To be consistent with the USDA baseline, there is no impact to NDM removals for 2007 because the DEIP is assumed to be

[2] MPSP outlays are not projected in the model. The impact 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.

Summary of Results

The impacts of the changes to the Class III and Class IV formulas that are set forth in this tentative final decision are summarized using annual and nine-year, 2007-2015, average changes from the model baseline. The results presented for the Federal order system are in the context of the larger U.S. market. In particular, the Federal order price formulas use national manufactured dairy product prices.

Producers. Over the nine-year period, the average Federal order minimum blend price for milk at test decreases $0.08 (0.55 percent) from a baseline level of $14.71 per hundredweight (cwt.) The average U.S. all-milk price decreases by about $0.05 (0.35 percent) from a baseline level of 14.79 per cwt. Federal order marketings decrease by an average 136 million pounds annually due to the production decrease in response to lower producer milk prices. Federal order milk cash receipts decrease by an average $125 million annually (0.65 percent) from baseline receipts of $19,165 million. U.S. milk marketings decrease by an average 206 million pounds annually (0.11 percent), yielding an average producer revenue decrease of $125 million annually (0.44 percent) from average baseline receipts of $28,396 million.

Milk Manufacturers and Processors. Increasing Federal order make allowances benefits dairy manufacturers by widening the spread between Federal order minimum prices and the prices that they receive for manufactured dairy products. While prices paid for milk are lower, prices received for dairy products are higher due to the tighter milk supply. Over the nine year projection period, wholesale dairy product prices increase as follows: $0.0119 per pound (0.82 percent) for cheddar cheese, $0.0305 (1.99 percent) for butter, $0.0012 (0.14 percent) for NFDM, and $0.0015 (0.56 percent) for dry whey.

With the proposed increases in make allowances, most Federal order component prices decrease on average over the nine-year projection period: $0.0038 per pound (0.16 percent) for protein, $0.0156 (2.24 percent) for nonfat solids, and $0.0361 (30.22 percent) for other solids. For the butterfat price, the increase in the butter price more than offsets the increase in the butter make allowance, resulting in an average increase of $0.0303 per pound (1.78 percent) over the projection period. Changes in Federal order component prices translate into reductions for Federal order skim milk pricing factors at 3.5 percent butterfat over the nine-year period: $0.22 per cwt for Class I and Class III, $0.14 per cwt for Class II and Class IV. Federal order Class I and III average prices decrease by $0.11 per cwt over the projection period, while Class II and IV prices decrease by $0.03 per cwt.

There are notable differences between changes in Federal order class prices at 3.5 percent butterfat and changes in Federal order class prices at class butterfat percentages. Butterfat tests for the four Federal order milk classes differ from one class to another due to the mix of products within each class. Butterfat proportions are higher for Class II and IV milk than for Class I and III milk. Average Class I and III prices at test are below baseline levels over the nine-year period: $0.16 per cwt (1.12 percent) for Class I and $0.11 per cwt (0.83 percent) for Class III. For Class II and Class IV prices at test, the increase in the butterfat price more than offsets the increase in the make allowances, resulting in prices above baseline levels for the nine-year period: $0.12 per cwt (0.58 percent) for Class II and $0.03 per cwt (0.20 percent) for Class IV.

Consumers. The expected $0.16 per cwt (1.12 percent) decrease in the minimum nine-year average Class I price at test results in an average $0.0137 per gallon decrease in the price of fluid milk for consumers. Consumers increase consumption of fluid milk products slightly, resulting in an increase of 17 million pounds (0.04 percent) in Federal order Class I marketings. Consumers reduce consumption of manufactured dairy products in response to higher dairy product prices. All of the manufacturing Federal order class marketings decrease as follows: 26 million pounds (0.15 percent) for Class II, 30 million pounds (0.06 percent) for Class III and 97 million pounds (0.62 percent) for Class IV.

Government Outlays. In 2007, with lower milk prices, MILC payments increase by $25 million (12.94 percent) above the baseline level of $190 million. This impact rounds to approximately $0.01 per cwt averaged over all of the milk production.

With an increase in Federal order make allowances, dairy product prices increase, milk production declines and government removals decrease relative to baseline levels. The analysis assumes that current MPSP make allowances will remain in effect throughout the projection period. Over the projection period government removals of NFDM decrease by an average of 9 million pounds (2.95 percent) per year. This reduces government outlays by an average $7 million per year over the projection period.

Conclusions

Increases in Federal order make allowances results in larger spreads between Federal order minimum prices and the prices manufacturers receive for manufactured dairy products. Lower Federal order minimum prices results in lower milk prices received by dairy producers. Dairy producers respond to lower milk prices by lowering milk production. With lower milk prices and lower milk production, Federal order cash receipts and U.S. producer revenues decrease. With tighter milk supplies, dairy product prices increase.

In contrast to manufactured dairy product prices, retail prices for fluid milk decrease as a result of increased make allowances. For both the current and proposed make allowances, Class III pricing factors are projected to be the price movers for Class I prices. The increased make allowances result in lower prices for Class III, therefore lowering Class I prices. Slightly lower retail prices are expected for consumers, resulting in a small increase in fluid milk consumption levels. Although Class I marketings increase, the increase is not sufficient to keep Class I producer revenues from decreasing.

Changes in the relative values of the various make allowances result in changes in the relative values of the manufacturing class prices and quantities. This is caused in part by the interaction between the quantities of milk supplied and the demands for nonfat solids and butterfat in the various dairy products. Further, the inverse relationship between the butterfat price and protein price in the Federal order protein formula also contributes to these circumstances.

Appendix

Federal Milk Order Price Information (Make Allowances in Bold)

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 **– 0.165**) x 1.383) + ((((Cheese price – **0.165**) x 1.572) - Butterfat price x 0.9) x 1.17).

Other Solids Price = (Dry whey price – **0.159**) times 1.03.

Butterfat Price = (Butter price – **0.115**) 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 - **0.14**) 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.