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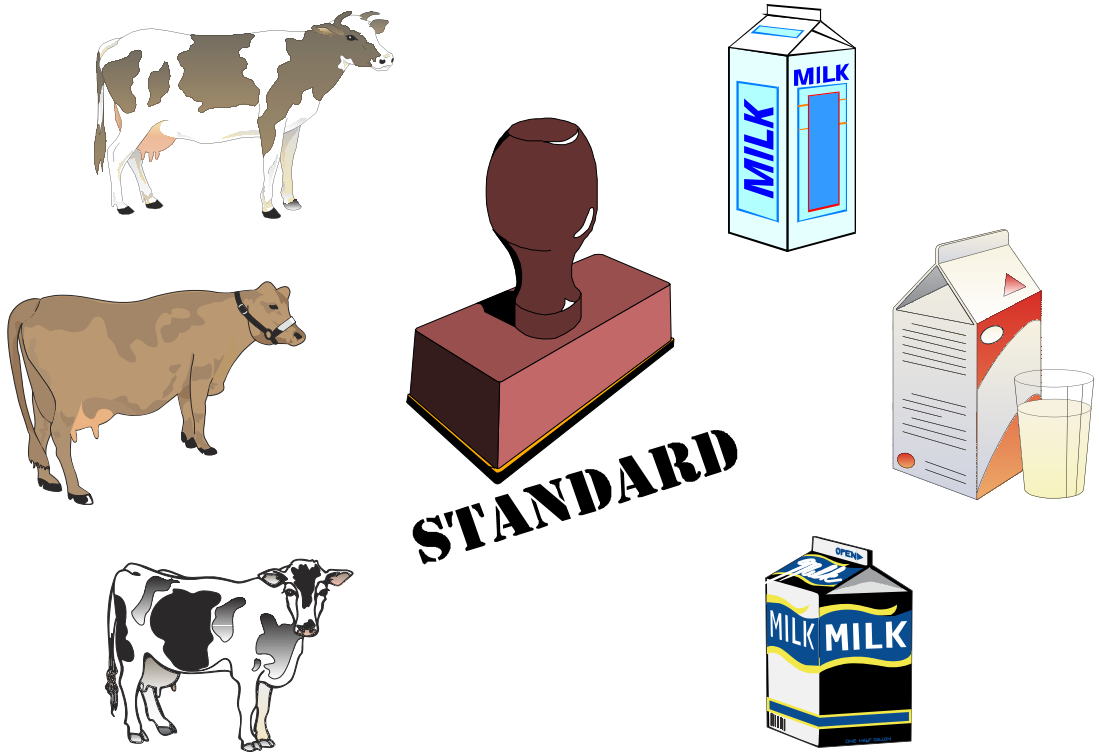
Raising the Minimum Nonfat Solids Standard to the National Average in Raw Milk: A Study of Fluid Milk Identity Standards



Prepared for the

Senate Committee On Agriculture, Nutrition and Forestry
and the
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By
Dairy Programs
Agricultural Marketing Service
United States Department of Agriculture

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Federal Milk Market Administrator Offices

Appreciation is due AMS Federal Milk Market Administrator offices for their provision of data and other information on the composition of raw farm milk and the current status of the fortification of fluid milk products. Individuals in these offices also provided valuable insight into the feasibility of increasing the levels of minimum nonfat solids for fluid milk products.

Additional AMS Personnel

Special thanks are due Jerry Cessna and Lisa Stewart of AMS for their assistance with this study.

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Chapter 1

Introduction

Milk, as it comes from the cow, contains water, butterfat, and nonfat milk solids. The nonfat milk solids are composed of proteins, lactose, and minerals. The percentage content of each component in the raw milk varies by breed of cow, season, and region. Components also can be affected by other factors, such as the ration fed to the cow. The estimated average annual composition of milk from the national dairy herd is 3.67 percent butterfat and 8.72 percent nonfat milk solids, of which 3.03 percent is true protein.[1] The remaining 87.61 percent is water. These annual averages have remained fairly constant during the past decade.

Fluid milk processors generally receive raw milk from the farm, process the milk into a variety of fluid milk products, package it, and distribute it for retail sale. Under Food and Drug Administration (FDA) regulations, processors can affect the composition of milk only by the addition or removal of butterfat or by the blending of appropriate volumes of milk of varying compositions to achieve the desired end product. FDA regulations allow certain products to be added to fluid milk, such as nonfat dry milk, condensed skim milk, or dry whole milk for fortification; vitamins A and D; and flavoring ingredients. If a processor receives a load of milk containing 3.67 percent butterfat and 8.72 percent nonfat milk solids, the processor may either (1) separate out butterfat until the butterfat in the milk to be bottled has been reduced to 2 percent or (2) add skim milk until a comparable result has been achieved. The processes of removing butterfat or adding skim milk increase the proportion of nonfat milk solids contained in the milk being standardized. Processors are prohibited from adding water to milk as a means of adjusting the butterfat content. The addition of water also would dilute the nonfat solids content of the standardized product.

Federal and State standards establish the minimum composition requirements for fluid milk products. FDA establishes national minimum standards that apply to fluid milk products that enter into interstate commerce. Individual States, the District of Columbia, and Puerto Rico may establish minimum standards of composition for fluid milk products marketed within their boundaries.

Federal standards for the butterfat content of fluid milk products are as follows: for whole milk, a minimum of 3.25 percent butterfat; for reduced-fat milk, a maximum of 2.1 percent butterfat but no minimum; for lowfat milk, a maximum of 1.2 percent butterfat but no minimum; and for fat-free milk, not more than 0.2 percent butterfat. For all of these fluid milk products, the minimum nonfat milk solids content of 8.25 percent is low

[1] A true protein measure does not contain nonprotein nitrogen (NPN), which is of no value to cheese yield. NPN is included in the estimation of total or crude protein. True protein is used under Federal order multiple component pricing as a basis for payment.

enough to assure that virtually all milk coming from the farm would meet the minimum standard.

Many States have adopted the Federal standards, but some States, notably California, have higher minimum component standards for fluid milk products. Fluid whole milk in California must contain a minimum of 3.5 percent butterfat and a minimum nonfat solids content of 8.7 percent. Reduced-fat milk must contain between 1.9 and 2.1 percent butterfat and a minimum of 10.0 percent nonfat milk solids. Lowfat milk must contain between 0.9 and 1.1 percent butterfat and a minimum of 11 percent nonfat milk solids. Fat-freee milk must contain a maximum of 0.2 percent butterfat and a minimum of 9.0 percent nonfat milk solids. (See Appendix I for a comparison of Federal and California standards.) To meet these higher nonfat milk solids standards, it is necessary for fluid milk processors who wish to sell fluid milk products in California to add nonfat milk solids, especially to fluid milk products containing 1 and 2 percent butterfat. This process is referred to in the industry as "fortification."

Dairy farmers have repeatedly approached Congress about raising the Federal minimum nonfat milk solids standard for fluid milk products above 8.25 percent. The National Milk Producers Federation petitioned FDA in the early 1980's to raise the minimum nonfat solids standards. Generally, such requests have called for the adoption of the higher-level component standards of California. Congress previously requested that the impacts of such action be studied.[2]

Recently, dairy farmers have become increasingly concerned that technological advances in the fractionation of milk could result in a reduction in the volume of nonfat milk solids sold in fluid milk products. This heightened concern is the result of recent technological advances in membrane filtration such as reverse osmosis (RO)[3] and ultra filtration (UF).[4] The current emphasis is on preserving fluid milk products as they currently exist rather than on creating an additional market for nonfat milk solids. Dairy farmers are concerned that—in the future—reconstitution of filtrated milk at the Federal minimum standard for nonfat solids content may become an accepted consumer product. Alternatively, a future change in Federal regulations could result in component filtration that could be used to filter out certain nonfat solids, thus reducing the overall nonfat solids content to the minimum. Should either of these scenarios occur, some dairy farmers and their organizations contend that competition could result in reduction of the nonfat milk solids content of fluid milk products toward the minimum standard of 8.25 percent. Current

[2] U.S. Department of Agriculture. *Nationwide Adoption of the California Solids Standards for Fluid Milk Products: Issues and Impacts.* Washington, DC: Economic Research Service, Staff Report No. AGES840816, August 1984.

[3] The RO process removes only water from milk. Under FDA regulations, water may be added to concentrated milk from the RO process and may be sold as a fluid milk product. Such products must be labeled as "reconstituted."

[4] The UF process removes water and selected components from milk, depending on the membrane used. Since more than water is removed, FDA regulations do not allow a reconstituted UF product to be labeled "milk."

FDA standards for nonfat solids in fluid milk products are set at a minimum of 8.25 percent—well below the average content in farm milk. Fluid milk products are Class I products under the Federal milk marketing order (FMMO) system and as such return a higher price to dairy farmers.

Recognizing these concerns, Congress included a provision in the Farm Security and Rural Investment Act of 2002 for study of the potential impacts of raising the nonfat solids standard to the national average level as it occurs in farm milk and adopting a minimum protein standard at the national average level as it occurs in farm milk as a separate composition standard for fluid milk products. (See Appendix II for the specific legislative language.)

Several questions must be answered if the Federal composition standards for fluid milk products remain unchanged and fluid milk processors offer fluid milk products to consumers in the future at minimum composition standards. The first set of questions deals with consumer acceptance. Such fluid milk products would have to be labeled as "reconstituted" under current labeling standards. Will consumers accept these products if they are so labeled? What if the requirement to label such products as "reconstituted" is abolished? Will consumers find these products satisfying? Will consumption of fluid milk products be increased even if the prices of reconstituted products are lower than those of regular products? These are difficult questions that probably cannot be answered with much certainty.

Numerous taste tests/buying intent surveys have been conducted to determine consumer interest in fluid milk products that contain higher nonfat milk solid levels. Although consumers frequently profess to prefer milk containing higher levels of nonfat milk solids and indicate that they would pay more for such products, these intentions have not been reflected by sales in the marketplace. Sales of fortified fluid milk products have not been a large proportion of total fluid milk sales (7.2 percent in comparable Federal order marketing areas in 1990) and have decreased in the last decade, reaching 5.3 percent in 1999 (the last year for which such data are available). In any event, questions of consumer acceptance are not addressed in this study. We have assumed in the analysis for this report that no changes occur in total fluid milk sales due to consumer preference when changes are made in the nonfat solids content of fluid milk products.

The second set of questions that will be addressed in this study include: (1) What will the increase in solids use be if the minimum level of solids is raised to the national annual average level of nonfat solids in farm milk?, (2) what will the decrease in solids use be if the minimum standards for fluid milk products are not raised and the annual average nonfat milk solids content declines toward the minimum 8.25 percent level?, (3) what effect would the availability of additional nonfat milk solids for manufacturing have on farm milk prices?, (4) what impacts on the Dairy Price Support Program might be expected if less solids are consumed in fluid milk products?, and (5) if a higher minimum standard for nonfat solids and a minimum protein standard are established, how will this affect the pricing of Class I milk in Federal milk orders?

Chapter 2

National Averages and Regional Differences in Butterfat, True Protein, and Nonfat Solids in Farm Milk and Fluid Milk Products

The 11 Federal milk marketing orders provided information concerning the pounds of milk pooled monthly on each order during 2001 and the average butterfat content for those producer deliveries. In seven orders, minimum prices are set for the nonfat solids content of the milk, including true protein and other nonfat solids. These orders test for nonfat solids and true protein components, and the tests were reported along with the butterfat tests. Four orders—the Florida, Southeast, Appalachian, and Arizona-Las Vegas marketing areas—do not set minimum prices for nonfat solids components, but rather set minimum prices for skim milk. These four orders do not test for or report the nonfat solids, true protein, or other nonfat solids content of producer milk, and therefore such data were estimated. California reports the butterfat and nonfat solids content of producer milk. These producer milk data were used to estimate the annual average U.S. nonfat solids and true protein contents.

Federal order data were used to develop nonfat solids and true protein contents of the various fluid milk products—whole milk, reduced-fat milk, lowfat milk, and fat-free milk.

Component Content Estimation

For the Southeast, Appalachian, and Arizona-Las Vegas orders, cooperative producer data were obtained by the market administrators. While it does not include all milk on the orders, the cooperative milk is considered representative. The reported butterfat tests for the three orders were used to calibrate the cooperative data to the orders (see Appendix III). Nonfat solids content and true protein content of the Florida order's producer milk were estimated based on the Southeast cooperative milk content relationships. The true protein content of California milk was estimated based on the relationship of nonfat solids content to true protein content in the seven Federal order marketing areas with component pricing.

Grade A milk marketings regulated by neither Federal orders nor the California State order system were estimated using State data from the Federal order report *Producer Milk Market Under Federal Milk Orders by State of Origin, 2001,* and Grade A marketings from the National Agricultural Statistics Service (NASS) publication *Milk, Disposition, and Income*. These State marketings were assumed to have component tests consistent with the closest Federal order market. The U.S. weighted average component tests were calculated using all data reported or estimated.

Annual Average Component Content Levels

The 2001 annual average component levels for the 11 Federal orders, California, and total United States are presented in Table 1. The U.S. weighted average butterfat content was 3.67 percent for 2001, ranging from 3.60 percent in the Florida order to 3.72 percent in the Upper Midwest order. The U.S. weighted average nonfat solids content of producer milk was 8.72 percent, ranging from 8.63 percent in the Florida order to 8.78 percent in the Western order. The U.S. weighted average true protein test was 3.03 percent, ranging from 2.97 percent in the Arizona-Las Vegas order to 3.06 percent in California and the Western order. Therefore, if minimum nonfat solid standards for fluid milk products were raised to reflect the national average solids content of farm milk, they would be raised by 0.47 percentage points—from 8.25 percent to 8.72 percent. If true protein standards were established for fluid milk products, they would be set at 3.03 percent.

Table 1. Estimated Annual Average Component Tests of Milk Marketed in Federal Order (FO) Markets, California, and the United States, 2001

	Non-FO Marketings[1]	FO Marketings[2]	Total Regional Marketings[3]	Total Nonfat Solids	Nonfat Solids Content	Total True Protein	True Protein Content	Total Butterfat	Butterfat Content
	Mil. Lbs	Mil. Lbs	Mil. Lbs	Mil. Lbs	%	Mil. Lbs	%	Mil. Lbs	%
Northeast	1,521	24,557	26,078	2,265	8.69	782	3.00	959	3.68
Appalachian	436	6,673	7,110	615	8.65	216	3.03	259	3.65
Southeast	241	7,769	8,011	693	8.66	244	3.04	292	3.64
Florida	4	2,772	2,776	240	8.63	84	3.02	100	3.60
Mideast	840	17,229	18,068	1,576	8.72	545	3.02	665	3.68
Upper Midwest	1,544	20,062	21,606	1,883	8.72	652	3.02	804	3.72
Central	1,339	17,836	19,175	1,675	8.74	582	3.04	707	3.69
Southwest	401	8,604	9,005	785	8.72	275	3.05	326	3.62
Arizona-Las Vegas	9	2,956	2,965	258	8.70	88	2.97	107	3.62
Western	4,500	4,677	9,177	805	8.78	281	3.06	332	3.61
Pacific Northwest	863	7,088	7,950	695	8.74	242	3.04	291	3.66
All Markets Combined	11,700	120,223	131,923	11,490	8.71	3,990	3.02	4,843	3.67
California			32,883	2,881	8.76	1,0007	3.06	1,210	3.68
Total U.S. [4]			164,805	14,371	8.72	4,997	3.03	6,053	3.67

[1] Estimated Grade A milk marketings that are not regulated under the Federal order or California systems. Figures are calculated based on State data on milk marketed under the Federal order system and Grade A marketings.
[2] Quantity of milk pooled on the specific order for 2001.
[3] Regional totals are the sum of the estimated non-FO marketings and FO marketings.
[4] For purposes of this study, only the 48 contiguous States are included.

From the annual averages, 5 of 11 orders—the Northeast, Appalachian, Southeast, Florida, and Arizona-Las Vegas–have lower nonfat solids content than the U.S. average of 8.72 percent. Five orders—the Northeast, Florida, Mideast, Upper Midwest, and Arizona-Las Vegas—have an annual average true protein content of less than the U.S. annual average of 3.03 percent.

Monthly component averages for the Federal orders, California, and United States are presented in Table 2 (butterfat), Table 3 (nonfat solids), and Table 4 (true protein). Nonfat solids tests were below the national annual average in the months of May through September and were the highest in the months of October through December. True protein tests were below the U.S. annual average from April through August.

Fluid Milk Product Nonfat Solids Content

The use of a separator permits the fractionation of whole milk into skim milk and cream. The skim milk and cream are reblended in calculated quantities to obtain the desired butterfat content of various fluid milk products. Other products, such as nonfat dry milk or condensed milk for fortification, vitamins A and D, and flavoring ingredients, may be added in this process as well.

The skim milk will vary in levels consistent with the quantity of nonfat solids and true protein in milk marketings from the farm level. Therefore, the nonfat solids and true protein contents of fluid milk products were calculated to reflect average farm milk nonfat solids and true protein contents.

Federal order statistics provide data for sales of specific fluid milk products. The nonfat solids and true protein contents of these sales were estimated from the averages of these components in the market's producer milk. Specifically (SNF = nonfat solids, BF = butterfat):

SNF % of fluid product = SNF % of producer milk ÷ (100%-(BF % of producer milk - BF % of fluid product))

True protein % of fluid product = True protein % of producer milk ÷ (100%-(BF % of producer milk - BF % of fluid product))

These formulas assume that the nonfat solids and true protein from the farm remain in the milk and capture the reduction in butterfat for each fluid milk product in the denominator, thus increasing the nonfat solids and true protein as a proportion of the fluid milk product. It should be noted that these calculations are based on the order average component content. The butterfat, nonfat solids, and protein content of milk received by individual fluid handlers vary within a market due to factors such as breed of cow, genetic variation within a breed, weather, and management factors such as nutrition practices.

The State of California has higher minimum standards for nonfat solids in fluid milk products than the Federal standards. Therefore, California fluid milk products generally must be fortified with other sources of nonfat solids throughout the year to comply with the higher standards. Based on 2001 California pool data, the average nonfat solids content of California fluid sales was 9.56 percent, compared to the Federal order annual average of 8.85 percent. There is currently some fortification taking place in fluid products marketed under the Federal order system. In most cases, this involves lower-fat products that would have a nonfat solids content higher than 8.72 percent and would therefore not need fortification to meet a new higher minimum standard. Fortification in

Table 2. Butterfat Content of Producer Milk by Federal Orders, California, and U.S. Averages, 2001

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Weighted Average
	(Percent)												
Northeast	3.78	3.75	3.74	3.70	3.63	3.58	3.55	3.53	3.61	3.72	3.77	3.76	3.68
Appalachian	3.78	3.72	3.69	3.62	3.55	3.55	3.54	3.54	3.60	3.72	3.75	3.74	3.65
Southeast	3.81	3.70	3.62	3.53	3.51	3.55	3.57	3.58	3.64	3.75	3.74	3.75	3.64
Florida	3.66	3.59	3.54	3.53	3.55	3.54	3.59	3.62	3.65	3.68	3.69	3.64	3.60
Mideast	3.81	3.78	3.76	3.71	3.61	3.58	3.53	3.52	3.62	3.75	3.78	3.78	3.68
Upper Midwest	3.81	3.79	3.77	3.73	3.66	3.61	3.55	3.55	3.66	3.79	3.82	3.82	3.72
Central	3.79	3.77	3.75	3.69	3.62	3.58	3.53	3.54	3.65	3.77	3.77	3.80	3.69
Southwest	3.77	3.71	3.63	3.55	3.50	3.50	3.51	3.51	3.58	3.67	3.71	3.76	3.62
Arizona-Las Vegas	3.71	3.65	3.60	3.55	3.54	3.54	3.54	3.57	3.61	3.63	3.68	3.79	3.62
Western	3.69	3.68	3.66	3.61	3.54	3.51	3.49	3.53	3.56	3.65	3.71	3.78	3.61
Pacific Northwest	3.72	3.72	3.68	3.66	3.59	3.55	3.56	3.58	3.62	3.70	3.74	3.78	3.66
All Federal Order Markets	3.78	3.75	3.72	3.67	3.60	3.57	3.54	3.54	3.63	3.74	3.76	3.78	3.67
California	3.81	3.77	3.71	3.66	3.6	3.57	3.58	3.59	3.63	3.69	3.77	3.85	3.68
U.S. Average[1]	3.78	3.75	3.71	3.66	3.60	3.57	3.55	3.55	3.63	3.73	3.76	3.79	3.67

[1] Weighted average based on Federal order, California, and other marketings.

Table 3. Solids Nonfat Content of Producer Milk by Federal Orders, California, and U.S. Averages, 2001

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Weighted Average
	(Percent)												
Northeast	8.73	8.71	8.73	8.69	8.67	8.63	8.60	8.57	8.66	8.77	8.78	8.72	8.69
Appalachian[1]	8.68	8.65	8.71	8.67	8.64	8.56	8.56	8.56	8.64	8.71	8.72	8.66	8.65
Southeast[1]	8.74	8.66	8.69	8.63	8.62	8.57	8.58	8.59	8.65	8.72	8.72	8.70	8.66
Florida[1]	8.64	8.59	8.63	8.63	8.64	8.57	8.59	8.62	8.65	8.68	8.68	8.63	8.63
Mideast	8.76	8.75	8.75	8.72	8.70	8.67	8.64	8.61	8.73	8.80	8.79	8.77	8.72
Upper Midwest	8.72	8.74	8.72	8.71	8.70	8.66	8.60	8.61	8.72	8.80	8.79	8.77	8.72
Central	8.78	8.79	8.77	8.74	8.72	8.67	8.62	8.59	8.75	8.81	8.80	8.80	8.74
Southwest	8.79	8.76	8.76	8.71	8.68	8.66	8.59	8.60	8.70	8.78	8.80	8.82	8.72
Arizona-Las Vegas[1]	8.78	8.75	8.73	8.70	8.69	8.60	8.60	8.62	8.64	8.73	8.76	8.83	8.70
Western	8.81	8.81	8.78	8.78	8.73	8.71	8.70	8.71	8.78	8.82	8.86	8.86	8.78
Pacific Northwest	8.74	8.75	8.73	8.75	8.71	8.69	8.69	8.70	8.75	8.80	8.80	8.80	8.74
All Federal Order Markets	8.74	8.73	8.73	8.71	8.68	8.65	8.62	8.61	8.71	8.78	8.78	8.76	8.71
California	8.83	8.81	8.76	8.76	8.7	8.68	8.67	8.70	8.76	8.79	8.82	8.85	8.76
U.S. Average[2]	8.76	8.75	8.74	8.72	8.69	8.65	8.63	8.63	8.72	8.78	8.79	8.78	8.72

[1] Estimated from data provided by the Market Administrator's office.

[2] Weighted average based on Federal order, California, and other marketings.

Table 4. True Protein Content of Producer Milk by Federal Orders, California, and U.S. Averages, 2001

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Weighted Average
	(Percent)												
Northeast	3.03	3.02	3.03	2.99	2.96	2.94	2.92	2.90	2.99	3.07	3.08	3.05	3.00
Appalachian[1]	3.08	3.04	3.05	3.04	3.00	2.96	2.95	2.96	3.04	3.10	3.12	3.05	3.03
Southeast[1]	3.12	3.05	3.07	3.02	3.01	2.96	2.97	2.98	3.04	3.11	3.10	3.09	3.04
Florida[1]	3.03	2.99	3.02	3.02	3.03	2.96	2.98	3.01	3.04	3.07	3.07	3.02	3.02
Mideast	3.08	3.06	3.05	3.01	2.97	2.94	2.90	2.92	3.04	3.10	3.10	3.07	3.02
Upper Midwest	3.05	3.05	3.03	2.99	2.97	2.95	2.90	2.92	3.03	3.11	3.10	3.08	3.02
Central	3.08	3.08	3.06	3.01	2.99	2.96	2.91	2.95	3.06	3.13	3.13	3.10	3.04
Southwest	3.11	3.07	3.06	3.03	3.00	2.96	2.95	2.98	3.05	3.13	3.13	3.14	3.05
Arizona-Las Vegas[1]	3.04	3.00	2.96	2.93	2.92	2.91	2.92	2.94	2.96	2.98	3.02	3.10	2.97
Western	3.10	3.09	3.06	3.05	3.01	3.00	2.98	2.99	3.06	3.13	3.15	3.16	3.06
Pacific Northwest	3.03	3.04	3.03	3.03	2.99	2.99	2.98	2.99	3.05	3.11	3.11	3.12	3.04
All Federal Order Markets	3.07	3.05	3.04	3.01	2.98	2.95	2.93	2.94	3.03	3.10	3.10	3.08	3.02
California[2]	3.13	3.11	3.06	3.06	3.01	2.99	2.98	3.01	3.06	3.09	3.12	3.15	3.06
U.S. Average[3]	3.08	3.06	3.05	3.02	2.98	2.96	2.94	2.96	3.04	3.10	3.11	3.10	3.03

[1] Estimated from data provided by the Market Administrator's office.
[2] Based on the relationship of protein test to solids nonfat content of milk in the seven Federal order markets that have component pricing.
[3] Weighted average based on Federal order, California, and other marketings.

Federal order markets occurs for reasons of taste and/or nutritional preference. FDA regulates dairy beverages that can be designated as "milk." Under FDA's definition, packaged fluid milk may include producer milk skimmed of butterfat and may include additions of cream, concentrated milk, dry whole milk, concentrated skim milk, or nonfat dry milk and be labeled as milk. The majority of California's milk fortification is accomplished with condensed skim milk. Of the fortification taking place in the Federal order system, nonfat dry milk seems to be the product most widely used.

Annual fluid milk sales by product are summarized for 2001 in Federal orders and unregulated markets in Table 5. (Monthly fluid sales data for the United States are summarized in Table 6.) The Federal order system represented 83 percent of the total U.S. fluid sales in 2001, while California represented 11 percent. The Northeast order had the largest share of the Federal order fluid sales at 23 percent, with the Mideast order having the second-largest share at 14 percent. The Arizona-Las Vegas (2 percent), Western (2 percent), and Pacific Northwest (4 percent) orders had the smallest share of total Federal order fluid sales. In the Federal order system, whole fluid milk and reduced-fat fluid milk each represent 32 percent of the total fluid sales. The remaining 36 percent of fluid sales are divided among fat-free (15 percent), lowfat (11 percent), flavored fat-reduced (5 percent), flavored whole (2 percent), and other fluid milk products (3 percent).

It should be noted that as the butterfat content is reduced in fluid milk products, the nonfat solids and true protein contents increase. On an annual average basis, only whole milk products, including flavored whole milk, are below the annual average producer milk solids nonfat content of 8.72 percent. This is also the case for true protein content, with the exception of reduced-fat milk in Arizona-Las Vegas. Of course, in specific months and markets, the average nonfat solids and true protein content of producer milk may be below the U.S. annual average.

Monthly fluid milk sales and component contents by Federal order are summarized in Tables 6 through 9. The monthly fluid sales data are summarized in Table 6. When adjustments are taken into account for the number of days in a month, fluid sales are the strongest during the months of October through March. Fluid sales are lowest in the months of June and July, when schools are not normally in session due to summer break. The monthly butterfat content, summarized in Table 7, does not vary much within a specific product throughout the year, since for most products the butterfat content is close to the minimum standard. Certain seasonal products such as eggnog that contain more butterfat than other fluid milk products may create a higher butterfat content for the overall fluid milk category during the months of November and December. The estimated monthly average nonfat solids and true protein contents of fluid milk products are summarized in Tables 8 and 9.

Table 5. Annual Summary of Fluid Milk Products in Federal Order System, California, and Other Sales by Product Type, 2001

Product	Northeast	Appalachian	Southeast	Florida	Mideast	Upper Midwest	Central	Southwest	Arizona-Las Vegas	Western	Pacific Northwest	Total FO	Unregulated
Total Sales of Fluid Milk Products							Million Pounds						
Whole Milk	4,081	1,586	1,898	1,140	1,595	632	1,127	1,901	265	181	350	14,756	1,288
Flavored Whole Milk	172	65	162	75	139	63	83	110	23	9	34	934	……
Reduced-Fat Milk	2,293	1,417	1,384	598	2,710	1,551	1,912	1,059	376	417	900	14,615	934
Lowfat Milk	1,741	244	336	266	634	529	501	350	110	195	305	5,212	399
Fat-Free Milk	1,681	597	611	370	942	993	828	347	134	120	342	6,964	412
Flavored Fat-Reduced Milk	476	208	255	118	437	258	295	218	30	65	93	2,452	……
Total Fluid Products	10,640	4,259	4,789	2,591	6,546	4,082	4,810	4,069	950	1,000	2,058	45,792	2,980
Average Butterfat Content of Fluid Milk Products							Percent						
Whole Milk	3.26	3.27	3.28	3.30	3.25	3.26	3.24	3.27	3.24	3.27	3.29	3.27	3.28
Flavored Whole Milk	3.31	3.62	3.23	3.51	3.66	2.87	3.41	3.72	3.14	3.61	3.90	3.43	……
Reduced-Fat Milk	1.98	1.98	2.00	1.96	1.97	1.98	1.95	1.90	1.94	1.99	1.98	1.97	1.97
Lowfat Milk	1.00	1.01	1.01	1.02	0.85	0.99	0.95	1.03	0.96	0.99	0.98	0.98	1.01
Fat-Free Milk	0.10	0.16	0.18	0.11	0.10	0.11	0.12	0.11	0.10	0.20	0.13	0.12	0.12
Flavored Fat-Reduced Milk	1.16	0.99	0.96	0.92	1.15	0.91	1.09	1.11	1.08	1.33	1.22	1.08	……
Total Fluid Products	2.02	2.10	2.18	2.20	1.88	1.54	1.81	2.31	1.95	1.80	1.77	1.98	2.15
Estimated Average Nonfat Solids Content of Fluid Milk Products							Percent						
Whole Milk	8.73	8.68	8.69	8.66	8.76	8.75	8.78	8.75	8.74	8.81	8.77	8.73	8.72
Flavored Whole Milk	8.72	8.65	8.69	8.64	8.73	8.79	8.76	8.72	8.75	8.78	8.72	8.72	……
Reduced-Fat Milk	8.84	8.79	8.80	8.77	8.88	8.87	8.89	8.87	8.85	8.93	8.89	8.85	8.85
Lowfat Milk	8.93	8.88	8.89	8.86	8.98	8.96	8.99	8.95	8.94	9.02	8.98	8.94	8.94
Fat-Free Milk	9.01	8.96	8.97	8.94	9.05	9.04	9.06	9.04	9.02	9.09	9.06	9.02	9.02
Flavored Fat-Reduced Milk	8.93	8.90	8.91	8.87	8.96	8.98	8.99	8.96	8.94	8.99	8.97	8.95	……
Total Fluid Products	8.83	8.79	8.79	8.76	8.89	8.91	8.91	8.84	8.85	8.94	8.91	8.85	8.83
Estimated Average Protein Content of Fluid Milk Products							Percent						
Whole Milk	3.01	3.05	3.06	3.03	3.04	3.03	3.05	3.06	2.99	3.08	3.05	3.04	3.04
Flavored Whole Milk	3.01	3.03	3.06	3.02	3.03	3.05	3.05	3.06	2.99	3.07	3.03	3.04	……
Reduced-Fat Milk	3.05	3.08	3.10	3.07	3.08	3.07	3.09	3.10	3.02	3.12	3.09	3.08	3.08
Lowfat Milk	3.08	3.12	3.13	3.10	3.11	3.10	3.13	3.13	3.06	3.15	3.12	3.11	3.11
Fat-Free Milk	3.11	3.14	3.15	3.13	3.14	3.13	3.15	3.16	3.08	3.17	3.15	3.13	3.13
Flavored Fat-Reduced Milk	3.09	3.13	3.14	3.11	3.11	3.12	3.14	3.15	3.06	3.14	3.12	3.12	……
Total Fluid Products	3.05	3.08	3.09	3.06	3.08	3.08	3.10	3.09	3.03	3.12	3.10	3.08	3.07

Table 6. Monthly Fluid Milk Sales by Order, 2001

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
							Million Pounds						
Northeast	892	825	954	852	905	853	836	866	876	946	914	923	10,640
Appalachian	368	328	370	334	351	336	337	375	352	378	373	357	4,259
Southeast	424	375	422	388	397	381	374	416	392	419	405	397	4,789
Florida	237	213	242	216	209	206	204	217	200	218	213	216	2,591
Mideast	588	517	588	525	544	511	505	538	534	574	562	560	6,546
Upper Midwest	351	323	361	324	343	314	312	345	337	363	358	350	4,082
Central	429	379	424	402	391	373	372	402	394	426	409	409	4,810
Southwest	359	316	352	326	337	314	315	355	334	376	349	337	4,069
Arizona-Las Vegas	85	76	83	79	77	74	73	81	78	82	82	81	950
Western	86	79	87	79	84	78	79	89	79	90	86	83	1,000
Pacific Northwest	182	158	177	165	173	164	165	171	168	181	177	177	2,058
Total FO	4,001	3,588	4,060	3,690	3,810	3,603	3,573	3,854	3,742	4,053	3,929	3,890	45,792
Unregulated	265	230	262	245	247	250	240	255	230	249	255	250	2,980
California	537	496	568	514	532	522	504	526	526	549	526	526	6,326
Total U.S.	4,803	4,314	4,891	4,449	4,589	4,375	4,317	4,634	4,498	4,851	4,710	4,666	55,097
Daily Fluid Milk Sales	155	154	158	148	148	146	139	149	150	156	157	151	151

Table 7. Weighted Average Butterfat Content for All Fluid Milk Products, 2001

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Weighted Average
							Percent						
Northeast	2.01	2.00	2.00	2.00	1.98	2.01	2.02	2.03	2.00	2.01	2.08	2.12	2.02
Appalachian	2.09	2.06	2.08	2.07	2.08	2.12	2.13	2.09	2.08	2.09	2.14	2.20	2.10
Southeast	2.17	2.14	2.14	2.14	2.15	2.23	2.25	2.16	2.14	2.15	2.22	2.28	2.18
Florida	2.15	2.14	2.15	2.18	2.20	2.24	2.25	2.21	2.18	2.18	2.24	2.29	2.20
Mideast	1.87	1.88	1.86	1.87	1.85	1.90	1.91	1.90	1.86	1.88	1.91	1.94	1.88
Upper Midwest	1.52	1.53	1.52	1.52	1.52	1.54	1.54	1.58	1.51	1.53	1.57	1.61	1.54
Central	1.79	1.77	1.78	1.79	1.79	1.84	1.85	1.81	1.78	1.79	1.83	1.87	1.81
Southwest	2.29	2.26	2.30	2.27	2.30	2.37	2.38	2.29	2.25	2.26	2.33	2.40	2.31
Arizona-Las Vegas	1.92	1.92	1.93	1.92	1.94	1.96	1.97	1.96	1.93	1.92	1.99	2.10	1.95
Western	1.80	1.78	1.76	1.77	1.76	1.78	1.78	1.78	1.75	1.81	1.89	1.94	1.80
Pacific Northwest	1.72	1.72	1.71	1.71	1.73	1.75	1.77	1.78	1.73	1.78	1.86	1.91	1.77
Total FO	1.96	1.95	1.95	1.95	1.95	2.00	2.01	1.99	1.95	1.96	2.02	2.07	1.98
Unregulated	2.10	2.13	2.14	2.14	2.13	2.18	2.17	2.15	2.14	2.15	2.12	2.19	2.15
California[1]	2.24	2.25	2.22	2.24	2.22	2.25	2.32	2.29	2.21	2.22	2.28	2.30	2.25
Total U.S.	2.00	1.99	1.99	2.00	1.99	2.04	2.05	2.03	1.99	2.00	2.05	2.10	2.02

[1] Based on California pool data.

Table 8. Weighted Average Nonfat Solids Content for All Fluid Milk Products, 2001[1]

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Weighted Average
							Percent						
Northeast	8.88	8.86	8.88	8.83	8.80	8.77	8.73	**8.69**	8.80	8.92	8.92	8.86	8.83
Appalachian	8.83	8.79	8.85	8.81	8.77	**8.69**	**8.68**	**8.69**	8.78	8.86	8.87	8.79	8.79
Southeast	8.88	8.80	8.82	8.75	8.74	**8.69**	**8.70**	**8.71**	8.79	8.86	8.85	8.83	8.79
Florida	8.77	8.72	8.76	8.75	8.76	**8.68**	**8.71**	8.74	8.78	8.81	8.81	8.75	8.76
Mideast	8.93	8.92	8.92	8.89	8.86	8.81	8.78	8.75	8.88	8.97	8.95	8.93	8.89
Upper Midwest	8.92	8.95	8.92	8.91	8.89	8.84	8.78	8.79	8.92	9.00	8.99	8.97	8.91
Central	8.96	8.97	8.95	8.91	8.88	8.83	8.77	8.75	8.91	8.99	8.98	8.98	8.91
Southwest	8.92	8.89	8.88	8.83	8.78	8.75	**8.69**	**8.71**	8.81	8.91	8.92	8.94	8.84
Arizona-Las Vegas	8.94	8.90	8.88	8.84	8.83	8.74	8.74	8.76	8.79	8.88	8.91	8.99	8.85
Western	8.99	8.98	8.96	8.95	8.89	8.86	8.86	8.87	8.94	8.99	9.03	9.03	8.94
Pacific Northwest	8.92	8.93	8.90	8.92	8.87	8.85	8.85	8.86	8.92	8.97	8.97	8.97	8.91
Total FO	8.90	8.88	8.88	8.85	8.82	8.77	8.74	8.73	8.84	8.92	8.92	8.90	8.85
Unregulated	8.89	8.86	8.87	8.83	8.80	8.75	8.73	8.72	8.82	8.91	8.92	8.89	8.83
California[2]	9.61	9.58	9.54	9.52	9.54	9.54	9.52	9.55	9.58	9.59	9.59	9.59	9.56
Total U.S.	8.98	8.96	8.96	8.93	8.90	8.85	8.83	8.83	8.93	9.01	9.00	8.97	8.93

[1] Figures in boldface denote the average nonfat solids content of total fluid milk products below the national average of 8.72% nonfat solids in producer milk. Although the order weighted average content of all fluid milk products may be above the national average, the average content of specific fluid milk products may be below the national average of 8.72% nonfat solids.

[2] Based on California pool data.

Table 9. Weighted Average True Protein Content for All Fluid Milk Products, 2001[1]

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Weighted Average
							Percent						
Northeast	3.08	3.07	3.08	3.04	**3.00**	**2.98**	**2.96**	**2.94**	3.04	3.12	3.13	3.09	3.05
Appalachian	3.13	3.09	3.10	3.08	3.05	**3.00**	**3.00**	**3.00**	3.09	3.16	3.17	3.10	3.08
Southeast	3.17	3.10	3.12	3.06	3.05	**3.00**	**3.01**	**3.02**	3.09	3.16	3.15	3.13	3.09
Florida	3.08	3.03	3.07	3.06	3.07	**3.00**	**3.02**	3.05	3.09	3.12	3.12	3.06	3.06
Mideast	3.14	3.12	3.11	3.07	**3.02**	**2.99**	**2.95**	**2.97**	3.09	3.16	3.16	3.13	3.08
Upper Midwest	3.12	3.12	3.10	3.06	3.03	**3.01**	**2.96**	**2.98**	3.10	3.18	3.17	3.15	3.08
Central	3.15	3.14	3.12	3.07	3.04	**3.01**	**2.96**	**3.01**	3.12	3.20	3.19	3.17	3.10
Southwest	3.16	3.11	3.10	3.07	3.03	**3.00**	**2.98**	**3.02**	3.09	3.17	3.18	3.18	3.09
Arizona-Las Vegas	3.09	3.05	**3.02**	**2.98**	**2.97**	**2.96**	**2.96**	**2.99**	**3.02**	3.04	3.07	3.15	3.03
Western	3.17	3.15	3.12	3.11	3.06	3.05	3.03	3.05	3.11	3.19	3.21	3.22	3.12
Pacific Northwest	3.09	3.11	3.09	3.09	3.05	3.05	3.03	3.04	3.11	3.17	3.17	3.18	3.10
Total FO	3.12	3.10	3.10	3.06	3.03	**3.00**	**2.98**	**2.99**	3.08	3.15	3.16	3.13	3.08
Unregulated	3.12	3.09	3.09	3.06	3.03	**3.00**	**2.98**	**2.99**	3.08	3.15	3.15	3.13	3.07
California	3.41	3.38	3.33	3.33	3.29	3.28	3.27	3.30	3.35	3.37	3.39	3.41	3.34
Total U.S.	3.16	3.13	3.13	3.09	3.06	3.03	**3.01**	3.03	3.12	3.18	3.18	3.16	3.11

[1] Figures in boldface denote the average true protein content of total fluid milk products below the national average of 3.03% true protein in producer milk. Although the order weighted average content of all fluid milk products may be above the national average, the average content of specific fluid milk products may be below the national average of 3.03% true protein.

Chapter 3

Regional Implications of Increasing the Minimum Nonfat Solids Standards and Adding Protein Standards

The implementation of the minimum standards for fluid milk products based on the national average nonfat solids and true protein content of farm milk would result in minimum standards of 8.72 percent for nonfat solids and 3.03 percent for true protein. These minimum standards would apply to all fluid milk products sold outside of California.

The quantities of additional nonfat solids and true protein required for the proposed minimum standards were calculated for each product by month and region. First, the monthly average nonfat solids and true protein contents were checked against the proposed minimum standards of 8.72 percent for nonfat solids and 3.03 percent for true protein. Second, for products requiring fortification to meet either the proposed true protein or nonfat solids standards, the amounts of nonfat dry or condensed skim milk necessary for fortifications were calculated. The average nonfat solids content is 96.2 percent for nonfat dry milk and 29.8 percent for condensed skim milk,[5] and the average true protein content was calculated to be 33.4 percent for nonfat dry milk and 10.4 percent for condensed skim milk, based upon the ratio of true protein to nonfat solids in milk. Finally, the fortification necessary for each product was the higher of the fortification needed to meet either the nonfat solids standard or the true protein standard. Since true protein is a portion of nonfat solids and producer milk has varying levels of each, a low true protein region may need more nonfat dry milk to fortify to the minimum true protein standard than is needed to meet the minimum nonfat solids standard, or vice versa.

As was noted in Chapter 2, fortification needs are based on the order average protein and nonfat solids content of producer milk and will vary. It could be expected that during months that the order average component test is at or above the minimum standard some fluid handlers could be receiving some producer milk at lower component levels and thus would have to fortify it.

All Federal orders would require some level of fortification, mainly due to the application of a minimum standard on true protein content. Table 10 shows the fortification by the pounds of nonfat solids, condensed skim milk, and nonfat dry milk required on a monthly basis for each individual Federal order. The total quantity of solids nonfat needed for the fortification of fluid milk products was estimated at 17.5 million pounds for milk regulated under the Federal order system and 1.1 million pounds for fluid milk sales not regulated under the Federal order system. This converts to an estimated total of 62.6 million pounds of condensed skim milk or 19.4 million pounds of nonfat dry milk for the

[5] USDA, *Weights, Measures, and Conversion Factors for Agriculture Commodities and Their Products*, 1992.

Table 10. Annual Quantities Required to Fortify Fluid Milk Products for Proposed Minimum Standards at 3.03 Percent True Protein and 8.72 Percent Nonfat Solids, by Market, 2001

	Quantity of Nonfat Solids	Quantity of Condensed Skim Milk	Quantity of Nonfat Dry Milk
	(Mil. Lbs)	(Mil. Lbs)	(Mil. Lbs)
Northeast	6.0	20.0	6.2
Appalachian	1.5	5.2	1.6
Southeast	1.2	4.0	1.2
Florida	0.9	2.9	0.9
Mideast	2.9	9.9	3.1
Upper Midwest	1.5	4.9	1.5
Central	1.4	4.8	1.5
Southwest	1.1	3.7	1.1
Arizona-Las Vegas	0.8	2.6	0.8
Western	0.1	0.2	0.1
Pacific Northwest	0.1	0.5	0.1
Total FO	17.5	58.8	18.2
Unregulated	1.1	3.8	1.2
Total U.S[1]	18.7	62.6	19.4

[1] Regional totals may not add to U.S. total due to rounding.

total United States. The Northeast order would account for more than 30 percent of the required fortification due to the fact that the producer deliveries regulated under the order contain 3.0 percent true protein, which is less than the national average of 3.03 percent true protein, and the market accounts for almost one-fourth of the total Federal order fluid sales. The Western and Pacific Northwest orders—the orders with the highest nonfat solids content in producer milk—would have the lowest quantity of required fortification.

Fortification would be needed mostly in the months of June, July, and August (Table 11). These 3 months would represent more than 80 percent of the estimated annual total. (For a more detailed table, see Appendix IV, Table 1.) More than two-thirds of the total required fortification would be for whole milk products, while very little fortification would be required for lowfat and fat-free milk products (Table 12). Each order would need to fortify whole milk some time during the year (Appendix IV, Table 2). Eight of the eleven FMMOs would have to fortify reduced-fat milk during some part of the year, while three orders would require some level of fortification for lowfat and fat-free fluid milk.

Table 11. Monthly Quantities Required to Fortify Fluid Milk Products for Proposed Minimum Standards at 3.03 Percent True Protein and 8.72 Percent Nonfat Solids, Total United States, by Month, 2001

Month	Quantity of Nonfat Solids	Quantity of Condensed Skim Milk	Quantity of Nonfat Dry Milk
	(Mil. Lbs)	(Mil. Lbs)	(Mil. Lbs)
Jan	0.1	0.2	0.1
Feb	0.2	0.6	0.2
Mar	0.1	0.5	0.1
Apr	0.7	2.3	0.7
May	2.0	6.6	2.0
Jun	3.9	13.2	4.1
Jul	5.9	19.8	6.1
Aug	5.2	17.5	5.4
Sep	0.5	1.6	0.5
Oct	0.0	0.1	0.0
Nov	0.0	0.0	0.0
Dec	0.1	0.3	0.1
Total[1]	18.7	62.6	19.4

[1] Monthly totals may not add to annual total due to rounding.

Table 12. Annual Quantities Required to Fortify Fluid Milk Products for Proposed Minimum Standards at 3.03 Percent True Protein and 8.72 Percent Nonfat Solids, by Product, 2001

Product	Quantity of Nonfat Solids	Quantity of Condensed Skim Milk	Quantity of Nonfat Dry Milk
	(Mil. Lbs)	(Mil. Lbs)	(Mil. Lbs)
Whole Milk[1]	12.6	42.1	13.0
Reduced-Fat Milk	4.8	16.2	5.0
Lowfat Milk[2]	1.0	3.3	1.0
Fat-Free Milk	0.3	1.0	0.3
Total Fluid Products[3]	18.7	62.6	19.4

[1] For the unregulated market and total U.S., flavored whole milk is included in the whole milk category.

[2] For the unregulated market and total U.S., flavored fat-reduced milk is included in the lowfat milk category.

[3] Individual product totals may not add to annual total fluid products due to rounding.

Economic Impact of Changes in the Nonfat Solids Content of Fluid Milk Products

The Dairy Programs' national dairy econometric model (DPNDEM)[6] was used to examine the economic impact of additional fortification of fluid milk products through the use of nonfat dry milk to meet the proposed minimum standards of 3.03 percent true protein and 8.72 percent nonfat solids for 2001. Two alternative scenarios were developed to estimate the impact of possible technologies that would allow the lowering of nonfat solids content in fluid milk to the current minimum standard of 8.25 percent. The first scenario was a 50 percent reduction in the difference between the current nonfat solids level and the minimum of 8.25 percent. The other scenario decreased the nonfat solids content of fluid milk products to the 8.25 percent minimum.

The DPNDEM includes milk marketed through the Federal order system, California, and other milk markets. Demands for fluid milk and the major manufactured dairy products are included. The model generates estimates for the annual average NASS wholesale prices for cheddar cheese, butter, nonfat dry milk, and dry whey. The Federal order pricing formulas are driven by the NASS prices. Resulting Federal order prices are averaged with California price estimates to estimate a U.S. all-milk price.

For this analysis, changes in retail prices reflect the changes occurring in the minimum Class I price at test and the Class I over-order premium. It was assumed that consumer demand and retail prices of fluid milk products would not be significantly affected by the change in nonfat solids in the fluid milk products.

Impact of Raising Minimum Standards to National Average in Producer Milk

Increasing the minimum standards for fluid milk products to the national average true protein and nonfat solids content in producer milk would have minimal economic impact (Table 13). The equivalent of 18.2 million pounds of nonfat dry milk would be used for fortification in the Federal order system, and a total of 19.4 million pounds would be used in the U.S. Under current regulations, this would create a reallocation of producer milk in the Federal order system. For pricing purposes, the Federal order system allocates a portion of nonfat dry milk used for fortification to Class I utilization. This allows for an increase in producer milk allocated for Class I use and a decrease in producer milk allocated to Class IV use. The 18.2 million pounds of nonfat dry milk used for fortification in the order system would result in an estimated increase of 11.7 million pounds in Class I utilization.[7] This would result in a decrease of 11.6 million pounds of producer milk allocated to Class IV utilization. However, the actual use of nonfat solids from producer milk used to manufacture nonfat dry milk would not change.

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[6] For further details on AMS Dairy Programs' national dairy econometric model, see Appendix B in the Economic Analysis for the Recommended Decision on Class III and Class IV Price Formulas at: http://www.ams.usda.gov/dairy/econ_anal_for_rec_dec.pdf and Appendix B in the Economic Analysis for the Final Decision on Class III and Class IV Price Formulas at: http://www.ams.usda.gov/dairy/econ_anal_fin_dec.pdf.

[7] In the Federal order system, a portion of the skim milk equivalent of the nonfat dry milk used in the fortification of fluid milk products is allocated to Class I milk utilization. It is calculated by multiplying 0.64 by the quantity of nonfat dry milk used for fortification.

The slightly higher volume of milk priced as Class I would provide a less than half-cent increase in the minimum blend price and the all-milk price. Milk production would increase by 100,000 pounds due to the small increase in the producer milk prices. The additional use of 19 million pounds of nonfat dry milk in fluid milk products would have decreased the Government purchase of nonfat dry milk by the same quantity in 2001, a 4 percent reduction, or a savings of about $18 million in support purchase costs.

If the impacts were measured using condensed skim milk, the results would be similar. An additional 62.6 million pounds of condensed skim milk would have been needed for fortification, thus reducing the production of nonfat dry milk by 19.4 million pounds in 2001.

Fluid milk processors would be expected to purchase a total of 19.4 million pounds of nonfat dry milk at the wholesale price level, resulting in a total cost of $19.0 million. As explained above, Class I use would increase in the Federal order system, with Class I handlers paying slightly less than $2 million more into the order pool. If the additional cost of slightly less than $21 million ($19.0 million in purchases of nonfat dry milk and $2 million in additional cost to the Federal order pool) due to fortification to meet the higher fluid milk standards would be passed on to the consumers, the retail price of fluid milk products could increase as much as $0.04 per hundredweight (cwt) of fluid milk, or $0.003 per gallon. Due to the inelastic price elasticity for fluid milk, the demand of fluid milk products would probably decrease slightly in response to the possible higher retail price. The producer milk prices (Federal Order blend price + plus premiums milk price and the U.S. all-milk price) would not be expected to change significantly from the price changes shown in Table 13 under the proposal to fortify to the national average. For a more detailed table, see Appendix V, Table 1.

Impact of Partial Reduction to the 8.25 Percent Nonfat Solids Content

The reduction of the nonfat solids content of fluid milk products from current levels to the halfway point of the current minimum standard of 8.25 percent would result in the nonfat solids content of Federal order Class I milk decreasing to 8.55 percent. The quantity of fluid milk sales would be expected to change only due to a demand response to a change in price. The analysis assumes no change in demand due to a change of taste and preferences because of the lower nonfat solids content.

The reduction in Class I nonfat solids content would allow more nonfat solids to move into manufactured products. The volume of nonfat solids in Class I milk would decrease by 145 million pounds, while the volume of nonfat solids in Class IV milk would increase by 144 million pounds with the additional 1 million pounds of nonfat solids being used in Class II and Class III products. An increase in nonfat solids available for manufacturing uses and a slight increase in available butterfat for butter production due to a shift in the distribution of butterfat among manufacturing products would create an increase in the production of cheese and butter, which would result in a slight reduction in the prices for these products. The wholesale price of nonfat dry milk was near the

Table 13. Changes in Selected Supply-Demand-Price Estimates Under Different Solids Nonfat Content of Fluid Milk Products From the Model Baseline Based on the USDA Baseline, 2001[1]

	Units	Baseline	Fortifying to National Average	SNF content decreasing halfway to 8.25 percent	SNF content decreasing to 8.25 percent
Required Nonfat Dry Milk Fortification					
U.S.	Mil. Lbs	[2]	19.4	NA[5]	NA
FO	Mil. Lbs	[2]	18.2	NA	NA
U.S. Milk Production	Mil. Lbs	165,336	0.1	-5.9	-11.9
U.S. Marketings SNF[3]					
Class I SNF	Mil. Lbs	4,869	18.7	-145.2	-290.4
Class IV SNF	Mil. Lbs	1,407	-18.7	143.8	287.5
FO Milk Marketings[4]					
Class I	Mil. Lbs	45,887	11.7	1.8	3.7
Class IV	Mil. Lbs	9,404	-11.6	-14.3	-28.6
FO Milk Prices at 3.5 Percent Fat					
Minimum Blend Price	$/cwt	14.90	0.00	-0.01	-0.02
Blend + Premiums Milk Price	$/cwt	15.03	0.00	-0.01	-0.02
FO Milk Prices at Test					
Minimum Blend Price	$/cwt	15.20	0.00	-0.01	-0.02
Blend + Premiums Milk Price	$/cwt	15.33	0.00	-0.01	-0.02
U.S. All-Milk Price	$/cwt	15.05	0.00	-0.01	-0.02
Government Removals of NDM	Mil. Lbs	496	-19.4	145	290

[1] See Appendix V for additional information.
[2] No data are available on nonfat dry milk used to fortify fluid milk products in 2001.
[3] For the "fortifying to national average" scenario, the quantity of nonfat solids moving from Class IV to Class I is the actual nonfat solids equivalent of the nonfat dry milk used for fortification.
[4] For the "fortifying to national average" scenario, the Federal order pooling provisions allow a portion of the skim milk equivalent of the nonfat dry milk used for fortification to be classified as Class I milk utilization.
[5] NA = Not applicable

support level in 2001, and therefore would not be further reduced. The slight reduction in manufactured product prices would result in a decrease in the minimum Federal order class prices. The less than $0.01 per cwt decrease in the minimum Class I price would result in a 1.8 million pound increase in Federal order Class I use (2.3 million pound increase for total U.S. Class I use). The Federal order blend price plus premiums milk price and the U.S. all-milk price would decrease by $0.01 per cwt. U.S. milk production would decrease very slightly in response to the lower producer milk prices. The shift of more nonfat solids out of Class I and into mainly Class IV use would result in a 145 million pound increase (29 percent) in Government purchases of nonfat dry milk and increase purchase costs by about $137 million.

Impact of Full Reduction to 8.25 Percent Nonfat Solids Content

In order to estimate the maximum impact, the nonfat solids content in fluid milk products was reduced to the current 8.25 percent standard minimum. The impacts are similar to the above scenario with larger magnitudes of changes.

As above, a reduction in the nonfat solids content of Class I milk would provide more nonfat solids for manufacturing uses, which would reduce the product price for cheese and would increase the quantity of Government purchases of nonfat dry milk. A shift in butterfat allocation among products would create more butterfat available for butter production, which would reduce the price of butter. The volume of nonfat solids in Class I milk would decrease by 290 million pounds, while the volume of nonfat solids in Class IV milk would increase by 288 million pounds. The resulting decrease in product prices and change in utilization would result in a decrease in minimum Federal order class prices. The slightly larger than $0.01 per cwt decrease in the minimum Class I price at test would result in a 3.7 million pound increase in Federal order Class I use (4.5 million pound increase for total U.S. Class I use). The Federal order blend plus premiums milk price and the U.S. all-milk price would decrease by $0.02 per cwt. U.S. milk production would decrease by 12 million pounds in response to the lower producer milk prices. The increased volume of nonfat solids out of Class I and into Class IV would result in a 290 million pound increase (58 percent) in Government purchases of nonfat dry milk and would increase purchase cost by almost $274 million.

Impacts Under Different Supply and Demand Conditions

The potential farm milk price impacts of raising, or not raising, the nonfat solids standards for fluid milk products were masked in the forgoing analyses by the existence of the milk price support program. As such, the impacts were manifested as changes in Government costs under the support program. The dairy outlook indicates substantial surpluses of nonfat dry milk at least through marketing year 2006, with supplies diminishing thereafter.

However, in order to better assess possible impacts on farm milk prices, the 2001 baseline was modified by removing the price support program. Thus, additional nonfat solids needed to fortify fluid milk products to a higher standard would have to be drawn from the market rather than from Government storage. Additional nonfat solids made available under the other two alternatives in which the nonfat solids content of fluid milk products were reduced would have to clear to the market instead of being purchased by the support program. We believe that the results of the following analysis also would be consistent with the impacts that would occur if the market for nonfat solids were well above the price support level.

When the dairy price support program is removed from the 2001 baseline, Government removal of nonfat dry milk is shifted to the export market, thus dropping the wholesale price from $0.9791 to $0.9164 per pound, the estimated world price. The all-milk price

would be $14.91 per cwt ($0.14 less), and milk production would be 77 million pounds lower. See Appendix V, Table 2 for the complete "no support" baseline.

Under the "no support" baseline, adoption of higher component standards for fluid milk products would have resulted in an increase in the Federal order blend price plus premiums of $0.02 per cwt at test. This increase is primarily the result of an increase in the nonfat dry milk price of about $0.008 per pound and a slight increase in the cheese price, which together more than offset a $0.01 decrease in the price of butter. Also, slightly higher Class I prices, which continue to be set by the Class IV advanced price, offset some of the small loss in Class I volume.

Again, this analysis assumed that any change in retail prices would reflect changes in the minimum Class I price at test and the Class I over-order premium, and it was assumed that consumer demand and the retail price of fluid milk products would not be significantly affected by the change in nonfat solids levels in the fluid milk products. The price elasticities for nonfat dry milk estimated from the DPNDEM were 0.6 for the domestic market and 2.6 for the international market. To the extent that these elasticities are overstated (understated) the price change estimates would be overstated (understated).

The impact of a partial reduction in the amount that the current level of nonfat solids in fluid milk products exceeds the minimum level of 8.25 percent would result in the Federal order blend price plus premiums falling by $0.13 per cwt at test. The additional milk solids that would be channeled into the production of nonfat dry milk would move to the international market, thus lowering the wholesale price by more than $0.055 per pound. The price of butter would increase by more than $0.07 per pound. All class prices at 3.5 percent butterfat would be lower. Class prices at test would be lower for Class I and Class III, which have lower butterfat tests, but higher for Class II and Class IV, which have higher butterfat tests.

If the nonfat solids content of fluid milk products were reduced to the minimum—8.25 percent—the Federal order blend price plus premiums would be reduced by an estimated $0.24 per cwt at test under the "no support" baseline. Additional nonfat dry milk production would lower the wholesale price of nonfat dry milk by slightly more than $0.10 per pound as it cleared to the international market. Reduced supplies of butterfat available for butter production resulted in an increase in the price of butter of almost $0.13 per pound.

Feasibility of Fortification of Fluid Milk Products

To assess the ability of fluid milk plants to meet a new, higher fluid milk standard for nonfat solids and true protein, the 8 Federal Milk Order Market Administrators (MA) who administer the 11 Federal milk orders were queried. A series of six questions was devised to determine the difficulty that a plant might face in acquiring product to be used in fortification and the additional cost involved. The questions and summarized responses are presented below. In some cases, MA responses were based on data and

knowledge resulting from order administration; in other cases, such as estimating costs, a sampling of handlers was used to develop a response.

Would fluid milk processing plants have difficulty obtaining the quantities of bulk condensed skim milk necessary for fortification? (This question focused on the availability of condensed skim milk because it is assumed that no plant would have difficulty acquiring nonfat dry milk should it prefer to use that product for fortification.)

With the exception of the Southeast and Florida markets, MAs reported that all fluid milk plants servicing their markets should be able to obtain the needed quantities of condensed skim milk. In the large Southeast order, only two plants—one in Louisiana and the other in Tennessee—had condensing capacity. The Florida market had no plants with condensing capacity.

Fluid milk plants choosing to fortify with condensed skim milk would have to compete with other uses of condensed skim milk at times during the year. This additional demand could be sufficient to bid up prices for condensed skim milk.

Do facilities exist within reasonable distances from fluid milk plants to supply condensed skim milk?

In the markets in which sufficient capacity to produce condensed skim milk exists, MAs indicated that supplies were within reasonable distances of most fluid processing plants. In the Western market, the MA indicated that the condensed skim supply for one fluid milk plant would be about 200 miles away, while the MA for the Appalachian market indicated that one fluid milk plant would need to reach out approximately 320 miles for a supply.

Do any regulated plants currently fortify fluid milk products?

Some plants in every market fortify some products. A few plants fortify reduced-fat, lowfat, and fat-free milk. Those plants and many other plants fortify other types of fluid milk products, such as flavored milk, flavored milk drinks, buttermilk, and eggnog.

Are plants fortifying with nonfat dry milk or condensed skim milk?

Indications are that most Federally regulated plants currently use nonfat dry milk for fortification. A few plants use condensed skim milk, and a few plants use both. Some plants use condensed skim milk to fortify reduced-fat and lowfat milk, and some use nonfat dry milk to fortify flavored milk, flavored milk drinks, and other fluid milk products.

Considerations mentioned for determining the fortification product used included the plant's handling capabilities, product specifications, and input prices.

What are the estimated processing costs (above the cost of the fortifying product) that the fortification process created for these plants?

MAs reporting on the estimated cost of current fluid milk product fortification described costs as minimal. A plant using both nonfat dry milk and condensed skim milk for fortification indicated that nonfat dry milk involved three times the processing costs of condensed skim milk, primarily due to additional labor. Nonfat dry milk was primarily used in the fortification of the minor fluid milk products.

Would fluid milk plants be able to meet the new standards without additional equipment?

In general, most handlers indicated that some additional equipment would be needed to meet the proposed higher standard. Most indicated that such additional equipment needs would be minimal. With computerized processing in most plants, the only additional equipment needed would be a tank to hold, or a vat to mix and hold, the fortifying product. One handler, however, indicated that a separate handling and mixing room would need to be constructed.

Chapter 4

Need For Component Pricing of Milk Used in Class I Products

Since the composition of milk received by handlers for use in fluid milk products can vary by load, by day, and by season, the composition of most milk receipts will not match the proposed standards. With the exception of milk for fluid use regulated and priced under the California milk marketing order, milk used in fluid milk products is priced on the basis of skim milk and butterfat. Even the seven Federal milk marketing orders that set minimum prices for milk used in manufactured products on a component basis price milk used in fluid milk products based on volume and butterfat.

If the new, higher proposed standards of composition for fluid milk products are adopted, it will be necessary for most fluid milk handlers to purchase additional nonfat milk solids at times during the year to fortify their farm milk receipts to the higher levels. The volume needed to be added to a load of milk will depend upon the composition of each load. Under Federal milk marketing orders, fluid milk handlers will have to account to the pool at the Class I price for these additional milk solids. One of the benefits of the Federal milk marketing order program is that similarly located fluid milk handlers pay the same minimum price for milk. The additional cost of adding nonfat solids to fluid milk products could result in unequal costs among handlers at various times during the year.

One of the unknowns is the market reaction to the needs of fluid processors to have milk to bottle that meets a higher minimum standard for nonfat milk solids. It would seem appropriate that farm milk meeting the higher standards would carry a premium. This premium would be related to the costs of fortification to a handler and may relate to the value that high-content milk has to manufacturers.

However, the California experience with higher standards has shown no market response to the need for fortification. The California milk marketing order resolved the issue of unequal cost to the satisfaction of fluid milk handlers by pricing milk used in fluid milk products on the basis of components. All butterfat, nonfat solids, and fluid carrier used in fluid milk products are priced separately under California's Class I pricing formulas. In addition, the order provided credits for nonfat solids used in fortification. In the case of fortification using nonfat dry milk, handlers may deduct for each pound of nonfat milk solids the difference between the Class I price and Class IV prices for nonfat solids, but no amount greater than $0.1985 per pound. For fortification with condensed skim milk, the deduction is at the fixed rate of $0.0987 per pound of nonfat milk solids. The credit provisions were included in the order to offset the processing cost of adding additional solids to low-testing milk and to reduce handler opposition to increasing the nonfat solids levels for fluid products.

Estimates indicate that for some Federal order markets in certain months, fortification to meet the higher fluid milk standards could raise costs as much as $0.04 per cwt of fluid

milk, or $0.003 per gallon. These figures are averages, and the range in costs could result in some changes being slightly larger. If fluid milk handlers find that differences in raw product costs due to fortification cause competitive problems, a hearing to amend Federal milk marketing orders to equalize such costs could be requested.

Chapter 5

Summary and Observations

Dairy farmers are becoming increasingly concerned that technological advances in the fractionation of milk could result in a reduction in the volume of nonfat milk solids sold in fluid milk products. Current FDA standards for nonfat solids in fluid milk products are set at a minimum of 8.25 percent, well below the average content in farm milk. Fluid milk products are Class I products under the FMMO system and as such return a higher price to dairy farmers.

In response to dairy farmers' concerns, Congress included a provision in the Farm Security and Rural Investment Act of 2002 directing the Secretary of Agriculture to study the potential impacts of raising the nonfat solids standards to the national average level as it occurs in farm milk and adopting the average true protein level as an additional standard for fluid milk products.

Dairy Programs of the Agricultural Marketing Service studied the issue and found the following for 2001:

- The average nonfat solids content of farm milk in the United States was 8.72 percent, and the average true protein content was 3.03 percent in 2001.

- The monthly averages for nonfat solids content of farm milk in May through August were below the annual average and for January-March and October-December were above it.

- The monthly averages for true protein content of farm milk in April through August were below the annual average and for January-March and September-December were above it.

- Farm milk in the Florida FMMO contained the lowest annual average amount of nonfat solids (8.63 percent), and farm milk in the Western FMMO contained the highest (8.78 percent).

- Farm milk in the Arizona-Las Vegas FMMO contained the lowest annual average true protein (2.97 percent), and farm milk in California and the Western FMMO contained the highest (3.06 percent).

- The amount of fortification needed to meet the true protein standards was greater than the amount needed to meet the higher nonfat solids standard.

- The fluid milk product that would require the most fortification is whole milk. Each market would need to fortify whole milk at some time during the year. Eight of the 11 FMMOs would have to fortify reduced-fat milk during some part

of the year. Three orders would require some level of fortification for lowfat and fat-free fluid milk.

- Meeting higher fluid milk standards would have led to an additional 19 million pounds of nonfat dry milk being used in fluid milk products in 2001. Government support purchases would have been reduced a similar amount, thus reducing Government purchases by about $18 million.

- If the nonfat solids content of fluid milk products were reduced to midway between the current average content and the minimum standard of 8.25 percent, 145 million pounds less nonfat solids would be used in fluid milk products. Government purchases of nonfat dry milk under the price support program would have increased by a like amount, costing an additional $137 million. Farm milk prices would have been about $0.01 per cwt lower because of the price support floor on nonfat dry milk prices.

- If the nonfat solids content of fluid milk product were at the minimum 8.25 percent, 290 million pounds less nonfat solids would be used in fluid milk products. Government purchases of nonfat dry milk under the price support program would have increased by a like amount, costing an additional $274 million. Farm milk prices would have been about $0.02 per cwt lower because of the price support floor on nonfat dry milk prices.

- An increase in purchases of nonfat dry milk would lead to increased Government stockpiles of nonfat dry milk and the potential need to lower the purchase price of nonfat dry milk and raise the purchase price of butter. Depending on market conditions, raising the purchase price of butter could raise butter prices, thus possibly offsetting some of the decline in farm milk prices caused by the lower nonfat solids price.

- The impacts of changes in component levels in fluid milk products were measured against a modified baseline in which the price support program was removed. The adoption of higher component standards for fluid milk products would have increased the farm milk prices by $0.02 due to a $0.008 per pound increase in the nonfat dry milk price. If the nonfat solids content of fluid milk products were reduced to midway between the current average content and the minimum standard of 8.25 percent, the Federal order blend price plus premiums at test would have decreased by $0.13 per cwt, and if the nonfat solids content of fluid milk products were reduced to 8.25 percent, the Federal order blend price plus premiums at test would have been reduced by an estimated $0.24 per cwt.

- A supply of nonfat dry milk or condensed skim milk is readily available to most fluid milk processors, and indications are that the additional cost of meeting higher fluid milk standards would be minimal.

Appendix I

Comparison of Federal and California Standards of Composition for Fluid Milk Products

Compositional Standards			
	Standard	**Federal**[1]	**California**
Grade A Pasteurized Whole Milk	Milkfat Minimum	3.25%	3.5%
	Milk Solids-Not-Fat (SNF), minimum	8.25%	8.7%
	Total Milk Solids	No Standard	12.2% Minimum
Grade A Reduced-Fat Milk	Milkfat	Maximum 2.1% No Minimum	Maximum 2.1% Minimum 1.9%
	SNF, minimum	8.25%	10.0%
Grade A Lowfat Milk	Milkfat	Maximum 1.2% No Minimum	Maximum 1.1% Minimum 0.9%
	SNF, minimum	8.25%	11.0%
Grade A Fat-Free Milk	Milkfat, maximum	0.20%	0.20%
	SNF, minimum	8.25%	9.0%

[1] Issued by the Food and Drug Administration

Appendix II

Legislative Language: Fluid Milk Identity Standards

FARM SECURITY AND RURAL INVESTMENT ACT OF 2002

Public Law 107-171 107th Congress
May 13, 2002

An Act

To provide for the continuation of agricultural programs through fiscal year 2007 and for other purposes.

* * * * * *

SEC. 1508. <<NOTE: 7 USC 7984.>> STUDIES OF EFFECTS OF CHANGES IN APPROACH TO NATIONAL DAIRY POLICY AND FLUID MILK IDENTITY STANDARDS.

* * * * * *

(b) Fluid Milk Identity Standards. – The Secretary shall conduct a study of the effects of including in the standard of identity for fluid milk a required minimum protein content that is commensurate with the average nonfat solids content of bovine milk produced in the United States.

(c) Reports. – Not later than 1 year after the date of enactment of this Act, the Secretary shall submit to the Committee on Agriculture of the House of Representatives and the Committee on Agriculture, Nutrition, and Forestry of the Senate a report describing the results of the studies required by this section.

Appendix III

Estimation of Nonfat Solids and True Protein Test for the Noncomponent Pricing Federal Orders and California

For the Southeast, Appalachian, and Arizona-Las Vegas orders, cooperative producer data were obtained by the Market Administrators. While not including all milk on the orders, the cooperative milk is considered representative. The reported butterfat tests for the three orders were used to calibrate the cooperative data to the orders. First, the cooperative component data were used to estimate statistical relationships between the butterfat content and nonfat solids and true protein content for each order. Details of the estimated relationships are below. Second, using each order's reported butterfat content, the order nonfat and true protein contents were estimated based on the estimated relationship.

Statistical Relationships Used to Estimate True Protein and Nonfat Solids Tests for Noncomponent Pricing Orders and California Based on Relationships From Cooperative Milk Data

Relationship Used to Estimate the Appalachian Nonfat Solids Test as a Function of the Order Average Butterfat Test[1]

Parameter	Estimate	t-test	Prob(t)
Intercept	6.781	42.841	0.000
Butterfat Test	0.502	11.707	0.000
Dummy - Mar-May	0.075	7.208	0.000
Dummy - Sep-Nov	0.058	5.674	0.000
		R-Square	0.952

[1] Relationship based on component test from cooperative milk pooled on the Appalachian order.

Relationship Used to Estimate the Southeast and Florida Nonfat Solids Test as a Function of the Order Average Butterfat Test[1]

Parameter	Estimate	t-test	Prob(t)
Intercept	6.278	46.054	0.000
Butterfat Test	0.646	17.258	0.000
Dummy - Mar-May	0.073	8.529	0.000
Dummy - Sep-Nov	0.024	3.003	0.017
		R-Square	0.975

[1] Relationship based on component test from cooperative milk pooled on the Southeast order.

Relationship Used to Estimate the Arizona-Las Vegas Nonfat Solids Test as a Function of the Order Average Butterfat Test[1]

Parameter	Estimate	t-test	Prob(t)
Intercept	6.374	11.992	0.000
Butterfat Test	0.629	4.237	0.003
Dummy - Mar-May	0.088	5.624	0.000
Dummy - Oct-Feb	0.072	3.111	0.014
		R-Square	0.925

[1] Relationship based on component test from cooperative milk pooled on the Arizona-Las Vegas order.

Relationship Used to Estimate the Appalachian True Protein Test as a Function of the Order Average Nonfat Solids Test[1]

Parameter	Estimate	t-test	Prob(t)
Intercept	-5.47	-8.50	0.00
Nonfat Solids Test	0.98	13.25	0.00
Dummy - April-May	-0.03	-2.57	0.03
Dummy - March	-0.05	-3.33	0.01
		R-Square	0.944

[1] Relationship based on component test from cooperative milk pooled on the Appalachian order.

Relationship Used to Estimate the Southeast and Florida True Protein Test as a Function of the Southeast Order Average Nonfat Solids Test[1]

Parameter	Estimate	t-test	Prob(t)
Intercept	-5.271	-9.115	0.000
Nonfat Solids Test	0.961	14.367	0.000
		R-Square	0.949

[1] Relationship based on component test from cooperative milk pooled on the Southeast order.

Relationship Used to Estimate the Arizona-Las Vegas True Protein Test as a Function of the Order Average Butterfat Test[1]

Parameter	Estimate	t-test	Prob(t)
Intercept	0.360	1.470	0.172
Butterfat Test	0.723	10.712	0.000
		R-Square	0.912

[1] Relationship based on component test from cooperative milk pooled on the Arizona-Las Vegas order.

Relationship Used to Estimate the California True Protein Test as a Function of the California Average Nonfat Solids Test[1]

Parameter	Estimate	t-test	Prob(t)
Intercept	-5.224	-16.697	0.000
Nonfat Solids Test	0.946	26.390	0.000
		R-Square	0.893

[1] Relationship based on component test from milk pooled on the seven component pricing Federal orders.

Appendix IV

Quantities of Fortification Required for Fluid Milk Products: Detail Tables

Table 1. Monthly Fluid Products Fortification Quantities Required for Proposed Minimum Standards at 3.03% Protein and 8.72% Nonfat Solids, by Market, 2001

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Quantity of Nonfat Solids (Million Pounds)													
Northeast	0.0	0.0	0.0	0.2	0.8	1.1	1.5	2.0	0.3	0.0	0.0	0.0	6.0
Appalachian	0.0	0.0	0.0	0.0	0.1	0.4	0.4	0.4	0.1	0.0	0.0	0.0	1.5
Southeast	0.0	0.0	0.0	0.1	0.1	0.4	0.3	0.2	0.1	0.0	0.0	0.0	1.2
Florida	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.9
Mideast	0.0	0.0	0.0	0.0	0.3	0.6	1.1	0.9	0.0	0.0	0.0	0.0	2.9
Upper Midwest	0.0	0.0	0.0	0.0	0.1	0.2	0.6	0.5	0.0	0.0	0.0	0.0	1.5
Central	0.0	0.0	0.0	0.0	0.1	0.3	0.7	0.3	0.0	0.0	0.0	0.0	1.4
Southwest	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.2	0.0	0.0	0.0	0.0	1.1
Arizona-Las Vegas	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.8
Western	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Pacific Northwest	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Total FO	0.1	0.2	0.1	0.6	1.8	3.6	5.5	4.9	0.5	0.0	0.0	0.1	17.5
Unregulated	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.3	0.0	0.0	0.0	0.0	1.1
Total U.S.	0.1	0.2	0.1	0.7	2.0	3.9	5.9	5.2	0.5	0.0	0.0	0.1	18.7
Quantity of Condensed Skim (Million Pounds)													
Northeast	0.0	0.0	0.0	0.8	2.6	3.8	5.2	6.8	0.9	0.0	0.0	0.0	20.0
Appalachian	0.0	0.1	0.0	0.1	0.4	1.3	1.5	1.5	0.2	0.0	0.0	0.1	5.2
Southeast	0.0	0.1	0.0	0.4	0.5	1.2	0.9	0.7	0.2	0.0	0.0	0.0	4.0
Florida	0.2	0.3	0.2	0.2	0.2	0.8	0.4	0.3	0.1	0.0	0.0	0.2	2.9
Mideast	0.0	0.0	0.0	0.1	0.9	2.0	3.8	3.2	0.0	0.0	0.0	0.0	9.9
Upper Midwest	0.0	0.0	0.0	0.1	0.4	0.7	2.1	1.6	0.0	0.0	0.0	0.0	4.9
Central	0.0	0.0	0.0	0.1	0.3	0.9	2.4	1.1	0.0	0.0	0.0	0.0	4.8
Southwest	0.0	0.0	0.0	0.0	0.4	1.1	1.5	0.7	0.0	0.0	0.0	0.0	3.7
Arizona-Las Vegas	0.0	0.0	0.2	0.4	0.5	0.5	0.5	0.4	0.2	0.1	0.0	0.0	2.6
Western	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2
Pacific Northwest	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.5
Total FO	0.2	0.6	0.5	2.2	6.2	12.2	18.5	16.4	1.5	0.1	0.0	0.3	58.8
Unregulated	0.0	0.0	0.0	0.1	0.4	0.9	1.3	1.1	0.0	0.0	0.0	0.0	3.8
Total U.S.	0.2	0.6	0.5	2.3	6.6	13.2	19.8	17.5	1.6	0.1	0.0	0.3	62.6

Table 1 (continued). Monthly Fluid Products Fortification Quantities Required for Proposed Minimum Standards at 3.03% Protein and 8.72% Nonfat Solids, by Market, 2001

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Quantity of Nonfat Dry Milk (Million Pounds)													
Northeast	0.0	0.0	0.0	0.3	0.8	1.2	1.6	2.1	0.3	0.0	0.0	0.0	6.2
Appalachian	0.0	0.0	0.0	0.0	0.1	0.4	0.5	0.5	0.1	0.0	0.0	0.0	1.6
Southeast	0.0	0.0	0.0	0.1	0.1	0.4	0.3	0.2	0.1	0.0	0.0	0.0	1.2
Florida	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.1	0.9
Mideast	0.0	0.0	0.0	0.0	0.3	0.6	1.2	1.0	0.0	0.0	0.0	0.0	3.1
Upper Midwest	0.0	0.0	0.0	0.0	0.1	0.2	0.7	0.5	0.0	0.0	0.0	0.0	1.5
Central	0.0	0.0	0.0	0.0	0.1	0.3	0.8	0.4	0.0	0.0	0.0	0.0	1.5
Southwest	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.2	0.0	0.0	0.0	0.0	1.1
Arizona-Las Vegas	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.8
Western	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Pacific Northwest	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Total FO	0.1	0.2	0.1	0.7	1.9	3.8	5.7	5.1	0.5	0.0	0.0	0.1	18.2
Unregulated	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.3	0.0	0.0	0.0	0.0	1.2
Total U.S.	0.1	0.2	0.1	0.7	2.0	4.1	6.1	5.4	0.5	0.0	0.0	0.1	19.4

Table 2. Total U.S. Volume of Fortification of Fluid Products Required for Minimum Standards at 3.03% Protein and 8.72% Nonfat Solids by Product, 2001

	Northeast	Appalachian	Southeast	Florida	Mideast	Upper Midwest	Central	Southwest	Arizona-Las Vegas	Western	Pacific Northwest	Total FO	Unregulated	Total US
Quantity of Nonfat Solids (Million Pounds)														
Whole Milk[1]	4.0	1.1	1.0	0.8	1.3	0.5	0.7	0.9	0.4	0.1	0.1	11.0	0.9	12.6
Flavored Whole Milk	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.7	……	……
Reduced-Fat Milk	1.2	0.4	0.1	0.0	1.2	0.7	0.5	0.1	0.3	0.0	0.0	4.6	0.3	4.8
Lowfat Milk[2]	0.4	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.7	0.0	1.0
Fat-Free Milk	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3
Flavored Fat-Reduced Milk	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	……	……
Total Fluid Products	6.0	1.5	1.2	0.9	2.9	1.5	1.4	1.1	0.8	0.1	0.1	17.5	1.1	18.7
Quantity of Condensed Skim (Million Pounds)														
Whole Milk[1]	13.4	3.7	3.4	2.6	4.5	1.8	2.5	3.0	1.4	0.2	0.4	36.9	2.9	42.1
Flavored Whole Milk	0.6	0.2	0.3	0.2	0.4	0.1	0.2	0.2	0.1	0.0	0.1	2.4	……	……
Reduced-Fat Milk	3.9	1.2	0.3	0.1	4.1	2.3	1.8	0.4	1.0	0.0	0.0	15.3	0.9	16.2
Lowfat Milk[2]	1.4	0.0	0.0	0.0	0.4	0.4	0.2	0.0	0.1	0.0	0.0	2.4	0.1	3.3
Fat-Free Milk	0.4	0.0	0.0	0.0	0.2	0.2	0.1	0.0	0.0	0.0	0.0	1.0	0.0	1.0
Flavored Fat-Reduced Milk	0.3	0.0	0.0	0.0	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.8	……	……
Total Fluid Products	20.0	5.2	4.0	2.9	9.9	4.9	4.8	3.7	2.6	0.2	0.5	58.8	3.8	62.6
Quantity of NDM (Million Pounds)														
Whole Milk[1]	4.2	1.2	1.0	0.8	1.4	0.6	0.8	0.9	0.4	0.1	0.1	11.4	0.9	13.0
Flavored Whole Milk	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.7	0.0	0.0
Reduced-Fat Milk	1.2	0.4	0.1	0.0	1.3	0.7	0.6	0.1	0.3	0.0	0.0	4.7	0.3	5.0
Lowfat Milk[2]	0.4	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.8	0.0	1.0
Fat-Free Milk	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3
Flavored Fat-Reduced Milk	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Total Fluid Products	6.2	1.6	1.2	0.9	3.1	1.5	1.5	1.1	0.8	0.1	0.1	18.2	1.2	19.4

[1] For the unregulated market and total U.S., flavored whole milk is included in the whole milk category.
[2] For the unregulated market and total U.S., flavored fat-reduced milk is included in the lowfat milk category.

Appendix V

Economic Impact Analysis: Detail Tables

Table 1. Changes in Selected Supply-Demand-Price Estimates Under Different Solids Nonfat Content of Fluid Milk Products From the Model Baseline, 2001

	Units	Baseline	Fortifying to National Average	SNF Content Decreasing Halfway to 8.25%	SNF Content Decreasing to 8.25%
U.S. Milk Production	Mil. Lbs	165,336	0.1	-5.9	-11.9
U.S. Milk Marketings[1]					
Class I	Mil. Lbs	55,051	12.4	2.3	4.5
Class II	Mil. Lbs	15,249	0.0	7.4	14.8
Class III	Mil. Lbs	77,827	0.0	3.7	7.4
Class IV	Mil. Lbs	16,151	-12.3	-19.3	-38.5
Total U.S. Marketings	Mil. Lbs	164,072	0.1	-5.9	-11.9
U.S. Marketings Fat					
Class I Fat	Mil. Lbs	1,123	0.0	0.0	0.1
Class II Fat	Mil. Lbs	1,368	0.0	0.6	1.2
Class III Fat	Mil. Lbs	2,627	0.0	0.2	0.4
Class IV Fat	Mil. Lbs	850	0.0	-1.1	-2.1
Total U.S. Fat	Mil. Lbs	6,026	0.0	-0.2	-0.4
U.S. Marketings SNF[2]					
Class I SNF	Mil. Lbs	4,869	18.7	-145.2	-290.4
Class II SNF	Mil. Lbs	1,255	0.0	0.6	1.2
Class III SNF	Mil. Lbs	6,798	0.0	0.3	0.6
Class IV SNF	Mil. Lbs	1,407	-18.7	143.8	287.5
Total U.S. SNF	Mil. Lbs	14,304	0.0	-0.5	-1.0
U.S. Marketings Skim[1]					
Class I Skim	Mil. Lbs	53,929	12.4	2.2	4.4
Class II Skim	Mil. Lbs	13,881	0.0	6.8	13.6
Class III Skim	Mil. Lbs	75,200	0.0	3.5	6.9
Class IV Skim	Mil. Lbs	15,301	-12.3	-18.2	-36.4
Total U.S. Skim	Mil. Lbs	158,310	0.1	-5.7	-11.4
FO Milk Marketings[3]					
Class I	Mil. Lbs	45,887	11.7	1.8	3.7
Class II	Mil. Lbs	11,807	0.0	6.4	12.8
Class III	Mil. Lbs	53,124	0.0	3.7	7.3
Class IV	Mil. Lbs	9,404	-11.6	-14.3	-28.6
Total FO Marketings	Mil. Lbs	120,223	0.1	-2.4	-4.8
FO Marketings Fat					
Class I Fat	Mil. Lbs	923	0.0	0.0	0.1
Class II Fat	Mil. Lbs	953	0.0	0.4	0.9
Class III Fat	Mil. Lbs	1,935	0.0	0.3	0.5
Class IV Fat	Mil. Lbs	603	0.0	-0.8	-1.7
Total FO Fat	Mil. Lbs	4,414	0.0	-0.1	-0.2

(continued on page 42)

Table 1 (continued). Changes in Selected Supply-Demand-Price Estimates Under Different Solids Nonfat Content of Fluid Milk Products From the Model Baseline, 2001

	Units	Baseline	Fortifying to National Average	SNF Content Decreasing Halfway to 8.25%	SNF Content Decreasing to 8.25%
FO Marketings SNF[2]					
Class I SNF	Mil. Lbs	4,060	17.5	-137.0	-274.0
Class II SNF	Mil. Lbs	1,004	0.0	0.5	1.1
Class III SNF	Mil. Lbs	4,611	0.0	0.6	1.1
Class IV SNF	Mil. Lbs	792	-17.5	135.7	271.4
Total FO SNF	Mil. Lbs	10,468	0.0	-0.2	-0.4
FO Marketings Skim[3]					
Class I Skim	Mil. Lbs	44,964	11.7	1.8	3.6
Class II Skim	Mil. Lbs	10,854	0.0	6.0	11.9
Class III Skim	Mil. Lbs	51,189	0.0	3.4	6.8
Class IV Skim	Mil. Lbs	8,801	-11.6	-13.5	-26.9
Total FO Skim	Mil. Lbs	115,809	0.1	-2.3	-4.6
FO Fat Content by Class					
Class I	%	2.01	0.0	0.0	0.0
Class II	%	8.07	0.0	0.0	0.0
Class III	%	3.64	0.0	0.0	0.0
Class IV	%	6.41	0.0	0.0	0.0
Total	%	3.67	0.0	0.0	0.0
FO Fat Value					
Class I	Mil. $	1,770	0.0	-2.9	-5.9
Class II	Mil. $	1,768	0.0	-2.3	-4.7
Class III	Mil. $	3,576	0.0	-5.6	-11.3
Class IV	Mil. $	1,114	0.0	-3.6	-7.2
Total	Mil. $	8,228	0.0	-14.5	-29.1
Fat Pool Price	$/lb	1.8643	0.0	0.0	0.0
FO Skim Value					
Class I	Mil. $	4,775	1.2	0.2	0.4
Class II	Mil. $	904	0.0	0.5	1.0
Class III	Mil. $	3,517	0.0	3.3	6.6
Class IV	Mil. $	664	-0.9	-1.0	-2.0
Total	Mil. $	9,860	0.3	3.0	5.9
Skim Pool Price	$/cwt	8.51	0.0	0.0	0.0
Product Prices					
Cheese Price	$/lb	1.4264	0.0000	-0.0006	-0.0013
Dry Whey Price	$/lb	0.2700	0.0000	0.0000	-0.0001
Butter Price	$/lb	1.6304	0.0000	-0.0027	-0.0053
NDM Price	$/lb	0.9791	0.0000	0.0000	0.0000

(continued on page 43)

Table 1 (continued). Changes in Selected Supply-Demand-Price Estimates Under Different Solids Nonfat Content of Fluid Milk Products From the Model Baseline, 2001

	Units	Baseline	Fortifying to National Average	SNF Content Decreasing Halfway to 8.25%	SNF Content Decreasing to 8.25%
FO Component Prices					
Protein Price	$/lb	1.9613	0.0000	0.0020	0.0040
Other Solids Price	$/lb	0.1343	0.0000	0.0000	-0.0001
Nonfat Solids Price	$/lb	0.8391	0.0000	0.0000	0.0000
FO Class Fat Prices					
Class I Price	$/lb	1.9180	0.0000	-0.0033	-0.0065
Class II Price	$/lb	1.8550	0.0000	-0.0033	-0.0065
Class III Price	$/lb	1.8480	0.0000	-0.0033	-0.0065
Class IV Price	$/lb	1.8480	0.0000	-0.0033	-0.0065
Fat Pool Price	$/lb	1.8643	0.0000	-0.0033	-0.0065
FO Class Skim Prices					
Class I Price	$/cwt	10.62	0.00	0.00	0.00
Class II Price	$/cwt	8.33	0.00	0.00	0.00
Class III Price	$/cwt	6.87	0.00	0.01	0.01
Class IV Price	$/cwt	7.55	0.00	0.00	0.00
Skim Pool Price	$/cwt	8.51	0.00	0.00	0.01
FO Milk Prices at 3.5% Fat					
Minimum Class I Price	$/cwt	16.96	0.00	-0.01	-0.02
Minimum Class II Price	$/cwt	14.53	0.00	-0.01	-0.02
Minimum Class III Price	$/cwt	13.10	0.00	-0.01	-0.01
Minimum Class IV Price	$/cwt	13.76	0.00	-0.01	-0.02
Minimum Blend Price	$/cwt	14.90	0.00	-0.01	-0.02
Blend + Premiums Milk Price	$/cwt	15.03	0.00	-0.01	-0.02
FO Milk Prices at Test					
Minimum Class I Price	$/cwt	14.26	0.00	-0.01	-0.01
Minimum Class II Price	$/cwt	22.77	0.00	-0.03	-0.06
Minimum Class III Price	$/cwt	13.43	0.00	-0.01	-0.01
Minimum Class IV Price	$/cwt	18.92	0.01	-0.02	-0.04
Minimum Blend Price	$/cwt	15.20	0.00	-0.01	-0.02
Blend + Premiums Milk Price	$/cwt	15.33	0.00	-0.01	-0.02
U.S. Milk Prices at Test					
U.S. Manufactured Value	$/cwt	13.30	0.00	-0.01	-0.01
U.S. All-Milk Price	$/cwt	15.05	0.00	-0.01	-0.02
Cash Receipts					
Federal Order	Mil. Dol.	18,433	0	-12	-23
United States	Mil. Dol.	24,696	0	-17	-33
Government Removals of NDM	Mil. Lbs	496	-19	145	290

[1] For the "fortifying to national average" scenario, the FMMO pooling provisions (see footnote 3) were assumed for the allocation of nonfat dry milk used for fortification in areas outside of the FMMO system.

[2] For the "fortifying to national average" scenario, the quantity of nonfat solids moving from Class IV to Class I is the actual nonfat solids equivalent of the nonfat dry milk used for fortification.

[3] For the "fortifying to national average" scenario, the FMMO pooling provisions allow a portion of the skim milk equivalent of the nonfat dry milk used for fortification to be classified as Class I milk utilization.

Table 2. Changes in Selected Supply-Demand-Price Estimates Under Different Solids Nonfat Content of Fluid Milk Products From the Alternate Model Baseline With No Price Support Program, 2001

	Units	Alternate Baseline	Fortifying to National Average	SNF Content Decreasing Halfway to 8.25%	SNF Content Decreasing to 8.25%
U.S. Milk Production	Mil. Lbs	165,259	9.9	-73.2	-136.6
U.S. Milk Marketings[1]					
Class I	Mil. Lbs	55,171	-3.1	109.7	206.4
Class II	Mil. Lbs	15,149	12.9	-82.0	-152.8
Class III	Mil. Lbs	78,136	-39.6	279.2	523.6
Class IV	Mil. Lbs	15,745	39.7	-380.1	-713.8
Total U.S. Marketings	Mil. Lbs	163,995	9.9	-73.2	-136.6
U.S. Marketings Fat					
Class I Fat	Mil. Lbs	1,125	-0.3	2.2	4.2
Class II Fat	Mil. Lbs	1,360	1.0	-6.5	-12.2
Class III Fat	Mil. Lbs	2,633	-0.8	5.5	10.2
Class IV Fat	Mil. Lbs	847	0.4	-3.9	-7.3
Total U.S. Fat	Mil. Lbs	6,023	0.4	-2.7	-5.0
U.S. Marketings SNF[2]					
Class I SNF	Mil. Lbs	4,879	17.3	-136.2	-274.1
Class II SNF	Mil. Lbs	1,246	1.1	-6.8	-12.7
Class III SNF	Mil. Lbs	6,825	-3.5	24.7	46.4
Class IV SNF	Mil. Lbs	1,370	-14.0	111.9	228.5
Total U.S. SNF	Mil. Lbs	14,297	0.9	-6.4	-11.9
U.S. Marketings Skim[1]					
Class I Skim	Mil. Lbs	54,046	-2.8	107.5	202.2
Class II Skim	Mil. Lbs	13,789	11.9	-75.5	-140.6
Class III Skim	Mil. Lbs	75,502	-38.9	273.7	513.4
Class IV Skim	Mil. Lbs	14,898	39.3	-376.2	-706.6
Total U.S. Skim	Mil. Lbs	158,236	9.5	-70.5	-131.6
FO Milk Marketings[3]					
Class I	Mil. Lbs	45,987	-1.2	91.4	171.9
Class II	Mil. Lbs	11,733	11.2	-71.1	-132.3
Class III	Mil. Lbs	53,359	-31.2	220.5	413.4
Class IV	Mil. Lbs	9,111	26.1	-276.4	-519.6
Total FO Marketings	Mil. Lbs	120,190	4.9	-35.6	-66.6
FO Marketings Fat					
Class I Fat	Mil. Lbs	923	-0.3	1.8	3.5
Class II Fat	Mil. Lbs	959	0.8	-4.9	-9.0
Class III Fat	Mil. Lbs	1,884	-0.4	3.7	6.8
Class IV Fat	Mil. Lbs	646	0.1	-1.9	-3.7
Total FO Fat	Mil. Lbs	4,412	0.2	-1.3	-2.4

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Table 2 (continued). Changes in Selected Supply-Demand-Price Estimates Under Different Solids Nonfat Content of Fluid Milk Products From the Alternate Model Baseline With No Price Support Program, 2001

	Units	Alternate Baseline	Fortifying to National Average	SNF Content Decreasing Halfway to 8.25%	SNF Content Decreasing to 8.25%
FO Marketings SNF[2]					
Class I SNF	Mil. Lbs	4,069	16.4	-129.6	-260.7
Class II SNF	Mil. Lbs	998	0.9	-6.0	-11.2
Class III SNF	Mil. Lbs	4,633	-2.8	11.4	20.3
Class IV SNF	Mil. Lbs	766	-14.1	121.1	245.8
Total FO SNF	Mil. Lbs	10,466	0.4	-3.1	-5.8
FO Marketings Skim[3]					
Class I Skim	Mil. Lbs	45,064	-0.9	89.5	168.5
Class II Skim	Mil. Lbs	10,774	10.4	-66.2	-123.3
Class III Skim	Mil. Lbs	51,475	-30.8	216.9	406.6
Class IV Skim	Mil. Lbs	8,465	26.0	-274.5	-515.9
Total FO Skim	Mil. Lbs	115,778	4.7	-34.3	-64.1
FO Fat Content by Class					
Class I	%	2.01	0.0	0.0	0.0
Class II	%	8.17	0.0	0.0	0.0
Class III	%	3.53	0.0	0.0	0.0
Class IV	%	7.09	0.0	0.2	0.4
Total	%	3.67	0.0	0.0	0.0
FO Fat Value					
Class I	Mil. $	1,822	-12.6	84.6	158.3
Class II	Mil. $	1,874	-11.1	74.0	137.6
Class III	Mil. $	3,669	-25.5	172.4	322.5
Class IV	Mil. $	1,258	-8.2	52.6	97.8
Total	Mil. $	8,623	-57.4	383.5	716.2
Fat Pool Price	$/lb	1.9544	0.0	0.1	0.2
FO Skim Value					
Class I	Mil. $	4,361	32.4	-216.2	-403.6
Class II	Mil. $	828	8.6	-58.4	-108.3
Class III	Mil. $	3,305	33.6	-230.2	-431.2
Class IV	Mil. $	592	7.9	-60.0	-109.8
Total	Mil. $	9,086	82.5	-564.8	-1053.0
Skim Pool Price	$/cwt	7.85	0.1	-0.5	-0.9
Product Prices					
Cheese Price	$/lb	1.4194	0.0015	-0.0112	-0.0209
Dry Whey Price	$/lb	0.2728	0.0001	-0.0009	-0.0017
Butter Price	$/lb	1.7117	-0.0107	0.0718	0.1341
NDM Price	$/lb	0.9164	0.0080	-0.0553	-0.1031

(continued on page 46)

Table 2 (continued). Changes in Selected Supply-Demand-Price Estimates Under Different Solids Nonfat Content of Fluid Milk Products From the Alternate Model Baseline With No Price Support Program, 2001

	Units	Alternate Baseline	Fortifying to National Average	SNF Content Decreasing Halfway to 8.25%	SNF Content Decreasing to 8.25%
FO Component Prices					
Protein Price	$/lb	1.8102	0.0220	-0.1506	-0.2810
Other Solids Price	$/lb	0.1372	0.0001	-0.0009	-0.0017
Nonfat Solids Price	$/lb	0.7764	0.0080	-0.0553	-0.1031
FO Class Fat Prices					
Class I Price	$/lb	1.9741	-0.0131	0.0875	0.1635
Class II Price	$/lb	1.9542	-0.0131	0.0875	0.1635
Class III Price	$/lb	1.9472	-0.0131	0.0875	0.1635
Class IV Price	$/lb	1.9472	-0.0131	0.0875	0.1635
Fat Pool Price	$/lb	1.9544	-0.0131	0.0875	0.1635
FO Class Skim Prices					
Class I Price	$/cwt	9.68	0.07	-0.50	-0.93
Class II Price	$/cwt	7.69	0.07	-0.50	-0.93
Class III Price	$/cwt	6.42	0.07	-0.47	-0.88
Class IV Price	$/cwt	6.99	0.07	-0.50	-0.93
Skim Pool Price	$/cwt	7.85	0.07	-0.49	-0.91
FO Milk Prices at 3.5% Fat					
Minimum Class I Price	$/cwt	16.25	0.02	-0.17	-0.32
Minimum Class II Price	$/cwt	14.26	0.02	-0.17	-0.32
Minimum Class III Price	$/cwt	13.01	0.02	-0.15	-0.28
Minimum Class IV Price	$/cwt	13.56	0.02	-0.17	-0.32
Minimum Blend Price	$/cwt	14.41	0.02	-0.16	-0.30
Blend + Premiums Milk Price	$/cwt	14.87	0.02	-0.15	-0.28
FO Milk Prices at Test					
Minimum Class I Price	$/cwt	13.45	0.04	-0.31	-0.58
Minimum Class II Price	$/cwt	23.03	-0.04	0.27	0.52
Minimum Class III Price	$/cwt	13.07	0.02	-0.16	-0.30
Minimum Class IV Price	$/cwt	20.30	-0.06	0.55	1.09
Minimum Blend Price	$/cwt	14.73	0.02	-0.15	-0.27
Blend + Premiums Milk Price	$/cwt	15.19	0.02	-0.14	-0.25
U.S. Milk Prices at Test					
U.S. Manufactured Value	$/cwt	13.14	0.02	-0.14	-0.26
U.S. All-Milk Price	$/cwt	14.91	0.02	-0.13	-0.24
Cash Receipts					
Federal Order	Mil. Dol.	18,253	23	-169	-315
United States	Mil. Dol.	24,456	31	-224	-417
Government Removals of NDM	Mil. Lbs	141	0	0	0

[1] For the "fortifying to national average" scenario, the FMMO pooling provisions (see footnote 3) were assumed for the allocation of nonfat dry milk used for fortification in areas outside of the FMMO system.

[2] For the "fortifying to national average" scenario, the quantity of nonfat solids moving from Class IV to Class I is the actual nonfat solids equivalent of the nonfat dry milk used for fortification.

[3] For the "fortifying to national average" scenario, the FMMO pooling provisions allow a portion of the skim milk equivalent of the nonfat dry milk used for fortification to be classified as Class I milk utilization.