



Information Letter Series

Dairy Supply Chain Impacts of Representative Policy Options Affecting Trade, Labor, and Food and Nutrition Programs

Information Letter 25-01

January 2025

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Summary

Many possible policy options were discussed during the 2024 election campaign, and now President Trump is beginning to act on some of these options as his second term begins. This Information Letter examines the impacts on dairy supply chain outcomes of a selected set of policy options affecting trade, labor availability, and spending on food and nutrition programs. Analyses with a dynamic global dairy supply chain model indicate that these policy options—individually or in combination—will result in substantive decreases in farm milk prices, US dairy farm profitability, the value of US dairy product exports, the value of cheese sales, retail fluid milk prices and wholesale cheese prices. Compensatory payments to dairy farms will reduce the magnitude of reductions in farm income and the value of US dairy product exports but will not fully offset these effects. The magnitudes of change reported here may differ from those for future more specific policy options, but the directions of impact on dairy supply chain participants should be similar.

Introduction

During the 2024 presidential campaign, President Trump mentioned many potential policies that could have important effects on the US agricultural economy, including the US dairy sector. Upon taking office on January 20th 2025, the President began issuing additional details about these potential policies, especially increasing tariffs on a wide range of imports from Mexico, Canada and China. The purpose of this Information Letter is to discuss the impacts on the US dairy supply chain (especially dairy farms, processors, and dairy product consumers) of potential policies affecting tariffs, labor availability and dairy product demand through food and nutrition programs currently funded by the Farm Bill.

Agriculture sector analysts are in broad agreement that, at present, there is a high degree of uncertainty about future policies, although there is disagreement about the timing and degree to which major policy changes may be implemented. Agricultural organizations also agree that uncertainty itself is highly undesirable—these organizations want to know the rules so that their organizations can determine how to best follow them and benefit from them. This uncertainty applies at multiple levels of policy formulation and implementation: policies, programs and regulations. *Policies* are usually considered the overarching statement of intent, *Programs* are the concrete plan of action and *Regulations* are the specific rules governing operation.

Given this uncertainty about specific future policies, programs and regulations, this Information Letter provides information about the impacts on key outcomes such as farm milk prices, farm profitability, and US export sales of representative policy option scenarios. These analyses facilitate understanding the relevant implications of these representative policies. These are forward-looking “what if” analyses of potential policy directions, which may inform future discussions by dairy industry organizations about policy directions.

Representative Policy Options Analyzed

Although many policy options could be considered, here the focus is on three key representative policy areas: *trade policy*, specifically, changes to tariffs imposed by the US and its dairy export destinations, *immigration policy*, such as removal of illegal immigrants affecting dairy farm labor availability, and *food and nutrition policy*, such reductions in spending on programs such as the Supplemental Nutrition Assistance Program (SNAP), Women, Infants and Children (WIC), the Healthy Fluid Milk Initiative (HFMI) and School Lunch and Breakfast programs). In addition, economists and market analysts anticipate a strengthening of the US dollar in international currency markets and higher US interest rates.

Tariff policies could have important impacts on dairy because the US exports nearly one-fifth of dairy components (mostly non-fat solids) and exports have been the main source of industry growth in the past decade. Key export markets are Mexico, Canada, China, which in 2024 accounted for about 40% of the total value of US dairy exports. Current tariff policies for the US are fairly restrictive of butterfat imports, so increases in US import tariffs are likely to have minimal impacts on US dairy product imports. If the US increases average tariff rates on dairy product imports by 25% and other countries retaliate in kind, this would increase the landed cost of US dairy products in export markets (especially relative to alternative suppliers) and decrease US export sales. It’s worth noting that any “retaliatory” tariffs imposed on US products could differ in magnitude and be imposed on a different set of products than the tariffs imposed by the US. Import tariffs can also affect the costs of farm machinery, given that a large proportion of some equipment, such as tractors, is produced in Mexico.

Immigration policies are important for US dairy farms and processors. Hired labor is a key productive input and cost on many dairy farms, especially for larger farms. Data from USDA’s Economic Research Service indicates that for the US dairy farms as a whole, labor

accounts for about 25% of operating costs and more than one-third of operating costs on larger dairy farms. Non-US citizens provide a large share of hired labor on dairy farms. The impacts of actions that would reduce the supply of labor to dairy farms are difficult to predict, but could include labor shortages, higher wage costs and lower productivity per worker during transition periods.

Food and nutrition spending is important for US dairy because programs like the Supplemental Nutrition Assistance Program (SNAP), Women Infants and Children (WIC), School Lunch and Breakfast Programs, and the Healthy Fluid Milk Initiative contribute notably to domestic demand for dairy products. For example, it's estimated that just under 10% of fluid milk in the US is consumed through school-based programs. Although more recent data would be helpful, in 2011 fluid milk and cheese were the most frequently purchased dairy products under SNAP based on data from USDA released in 2016. Reductions in spending thus will have implications for overall US domestic dairy demand.

Five possible representative policies are analyzed (Table 1):

Trade Policy with Feed Cost Change: This scenario assumes 25% retaliatory tariffs by key dairy export locations (e.g., Mexico, Canada and China) on all US dairy products, offset to some extent by a 10% reduction in feed costs (due to reduction in prices for grains and oilseed assuming that tariffs are also imposed on US exports of these products).

Trade Policy without Feed Cost Change: This scenario is the same as the prior one but assumes no change in feed costs.

Immigration Policy: This scenario assumes that action on immigration is sufficient to reduce immigrant labor available to US dairy farms and processors, which results in 20% higher wage costs on dairy farms, 20% unit costs increases for fluid milk processors and cheese manufacturers and temporary 10% reduction in the productivity of dairy farm labor due to the need to recruit and train new workers to replace those departing.

Food and Nutrition Policy: This scenario assumes a 4% reduction in demand for fluid milk and cheese due to reductions in spending on food and nutrition programs.

Combined Policies: This scenario assumes a combination of the policies described previously with no impact on feed costs.

All scenarios also assume a 10% increase in the value of the US dollar over time against other currencies and a 2% (i.e., an increase of two percentage points) increase in interest rates for farm borrowing. All policy changes and related effects are assumed to be implemented in March 2025, and include the changes to milk pricing formulas that will be implemented in June 2025. These scenarios are evaluated compared to a Baseline scenario without changes (other than pricing formulas under FMMOs.)

Table 1. Assumptions Used in Analysis of Representative Policy Options

Scenario Assumption	Trade Policy with Feed Cost Change	Trade Policy No Feed Cost Change	Immigration Policy	Food and Nutrition Policy	Combined Policies
Retaliatory Tariff Rate on US Dairy Exports	25%	25%	0%	0%	25%
Impact on Feed Costs	-10%	0%	0%	0%	0%
Impact on Farm Machinery Costs	10%	10%	0%	0%	10%
Impact on Farm Wages	0%	0%	20%	0%	20%
Impact on Fluid Milk Processor Unit Costs	0%	0%	20%	0%	20%
Impact on Cheese Manufacture Unit Costs	0%	0%	20%	0%	20%
Impact on Farm Labor Productivity	0%	0%	-10%	0%	-10%
Program Demand for Fluid Milk and Cheese	0%	0%	0%	-4%	-4%
Impact on US Dollar Value	10%	10%	10%	10%	10%
Impact on Interest Rates	2%	2%	2%	2%	2%

Analytical Methods

This assessment of the impacts of potential policy changes uses a detailed empirical System Dynamics (SD) model of the U.S. dairy supply chain adapted from the commodity supply chain model described in Sterman (2000); a previous version is described in Nicholson and Stephenson (2015). This model has been developed and adapted to the US dairy industry during the past 15 years. The base year for the model is 2013, meaning that 2013 data on milk production and dairy product consumption and trade are used to initialize the model. The model simulates monthly outcomes from 2013 to the end of 2028. The model comprises modules that represent farm milk supply, farm milk pricing, dairy product processing, inventory management and trade, and dairy policies including (for the US) minimum regulated pricing under Federal Milk Marketing Orders (FMMO) and the Dairy Margin Coverage (DMC) program the margin previously known as the Margin Protection Program—Dairy.

The milk supply components of the model are based on up to five farm-type categories based on size and production system based per region. In the US, farm types are based on number of cows and whether the farm is grazing. The number of cows for each farm size category is treated as a productive asset, and the evolution of cow numbers depends on heifers entering the herd (which depends on previous breeding decisions) and culling decisions (which can be voluntary or involuntary). The dairy-processing component of the dynamic model incorporates 23 products, 20 of which are “final” products (have explicit demand curves) and 13 of which are “intermediate” products that are used in the manufacture of other dairy products. Non-storable products (fluid, yogurt, ice cream and cottage cheese) are assumed manufactured in the month in which they are consumed.

Storable products have inventories, and the value of inventory in each region relative to sales (called “inventory coverage”) is used in setting prices for these products.

To account for changes to trade policy, the model includes representations of the dairy sectors and trade policies for 15 aggregated regions, two for the US (California and Rest of US), and 13 non-US regions, including the ASEAN countries (10 countries), Oceania (Australia and New Zealand), the EU (28 countries), Russia, China, Mexico, India, Canada, former Soviet Union countries (11 countries), Middle East and North Africa (MENA; 19 countries), major South American milk producers (Brazil, Argentina, Uruguay), Other Net Importing Countries (described below) and Other Net Exporting Countries.

Results

The proposed policies would have substantive impacts on dairy supply chain outcomes based on the assumed values of the model inputs for retaliatory tariff rates, impacts on feed costs, impacts on wage rates and labor productivity, impacts on processing costs, and impacts on demand for domestic food programs. All of the policy option scenarios would:

- Reduce the average all-milk price from 0.10/cwt for immigration policy, to \$1.90/cwt for the trade policy scenarios with decreased feed costs;
- Reduce the average Class III milk price from \$0.58/cwt for immigration policy, to \$2.86/cwt for the trade policy with decreased feed costs;
- Reduce total annual average US milk production by 5% to 11% for the trade policy with decreased feed costs and the Combined scenario, respectively.
- Reduce farm profitability as measured by average Net Farm Operating Income (NFOI) for a medium-sized dairy farm (about 250 cows) by between \$27,000 and \$110,000 per year for the trade policy with decreased feed costs and the Combined scenario, respectively. These reductions are between 11% and 46% of the Baseline (no-policy) scenario;
- Reduce the cumulative NFOI for all US dairy farms (i.e., of all sizes) during the next four years following policy implementation by between \$7 billion and \$17 billion, which is 22% to 45% of the NFOI for the Baseline scenario. The largest impacts are for the Combined scenario and the smallest for the Food and Nutrition Program scenario;
- Reduce the total cumulative value of US dairy product exports during the next four years by \$6 billion to \$22 billion, which is 12 to 41% of the value for the Baseline scenario;
- Reduce the total cumulative value of US cheese sales (domestic and export) during the next four years by \$1.2 billion to 4.0 billion, or 4% to 13% of the value for the Baseline scenario;
- Reduce average retail prices for fluid milk from 3% to 6% and wholesale prices for American cheese by 2% to 13% compared to the Baseline scenario.

Taken together, these results suggest substantive negative effects of these policy options on US dairy farms and processors, albeit with some benefits from lower prices for dairy product consumers. However, the policy options differ in their extent of impact on the reported outcomes. Changing trade policies (with and without reductions in feed costs) tends to result in larger decreases in milk prices, retail prices and US Exports. Immigration policy, because it largely affects the domestic costs for labor on dairy farms and processing, results in smaller price impacts but larger impacts on farm profitability. Reducing demand for dairy products results in smaller farm price and farm income impacts but still has a substantive effect on wholesale cheese prices.

Impacts of Compensatory Payments

During the first Trump administration, compensatory payments were made to US dairy farms under the Market Facilitation Program, and similar programs have been mentioned as policy options for the second administration. An additional set of scenarios can assess the impacts of compensatory payment programs on the farm profitability and market outcomes previously reported. Three scenarios are analyzed, each using the Combined Policies scenario assumptions but with a per hundredweight (cwt) compensatory payment ranging from \$0.50/cwt to \$2.00/cwt paid on all milk produced by US dairy farms. The impacts of compensatory payments can be compared to the Baseline scenario to assess whether the compensatory payments fully offset any negative impacts on farm profitability and also to the Combined Policies scenario to assess the impact of the payments compared to a no-payments scenario. The key findings of these scenarios (Table 3) are that compensatory payments:

- Result in additional reductions in the average US All-milk price and Class III price compared to the Combined Policies scenario because they support additional milk production;
- Increase Net Farm Operating Income (NFOI) for a medium-sized farm compared to the Combined Policies without compensatory payments but not fully compensate farms for the income lost due to the implemented policies. A medium-sized farm would have annual income about \$50,000 lower than the Baseline during the next four years even with \$2.00/cwt compensatory payments;
- Increase Cumulative NFOI for all US farms compared to the Combined Policies without compensatory payments but not fully compensate farms for the income lost due to the implemented policies. Cumulative NFOI for all US dairy farms would be \$8.8 billion lower than the Baseline during the next four years even with \$2.00/cwt compensatory payments;
- Increase the value of US Exports compared to the Combined Policies without compensatory payments due to lower product prices but not fully compensate for exports lost due to the implemented policies. The value of US dairy product exports would be \$19 billion lower than the Baseline during the next four years even with \$2.00/cwt compensatory payments;
- Decrease cumulative revenues to US cheese manufacturers compared to the Baseline by \$0.4 billion due to lower product prices;

- Decrease average American Cheese prices by up to \$0.09/lb compared to the Combined Policies with without compensatory payments;
- Incur program costs to the US government of between \$4.6 billion and \$19.3 billion during the next four years.

These results suggest that a compensatory payment program will have some positive impacts on US dairy farm profitability and dairy product exports but will not fully compensate farmers or exporters for the other impact of the combined policies.

Limitations

There are two key limitations to consider in interpreting these results. First, these are analyses of possible (i.e., representative) policy options, not specific policy or programmatic proposals. To the extent that future policy proposals or legislative actions differ from those assumed here, their impacts will likely be different. However, if enacted policies and programs have similar elements to those analyzed here, the direction of effects (e.g., lower farm prices and profitability) is likely to be similar to these results although the magnitudes could differ. A second limitation is that this partial equilibrium model does not directly include other possible economy-wide changes of other administration policies or program changes that would affect the accuracy of the assumptions about impacts on wages and demand responses made for these analyses.

References Cited

- Nicholson, C. F., and M. W Stephenson. 2015. Dynamic Market Impacts of the Dairy Margin Protection Program. *Journal of Agribusiness*, 32:165-192.
- Sterman, J. D. 2000. *Business Dynamics: Systems Thinking and Modeling for a Complex World*. Boston: Irwin/McGraw-Hill.

Table 2. Simulation Model Estimates of the Impacts of Representative Policies

Modeled Outcome	Units	Baseline	Trade Policy With Feed Cost Change	Trade Policy No Feed Cost Change	Immigration Policy	Food and Nutrition Policy	Combined Policies
All Milk Price	\$/cwt	20.92	19.02	19.72	20.82	20.27	19.90
Difference from Baseline			-1.90	-1.20	-0.10	-0.65	-1.02
% Difference from Baseline			-9.1%	-5.7%	-0.5%	-3.1%	-4.9%
Class III Price	\$/cwt	18.48	15.62	16.07	17.90	17.33	16.32
Difference from Baseline			-2.86	-2.41	-0.58	-1.15	-2.16
% Difference from Baseline			-15.5%	-13.0%	-3.1%	-6.2%	-11.7%
Total US Milk Production	bil lbs per year	269.1	254.9	248.5	254.5	256.6	238.3
Difference from Baseline			-14.1	-20.6	-14.6	-12.5	-30.7
% Difference from Baseline			-5.3%	-7.6%	-5.4%	-4.7%	-11.4%
Net Farm Operating Income, Medium Farm	\$/farm/year	208,685	181,014	152,614	144,203	172,927	98,414
Difference from Baseline			-27,671	-56,071	-64,482	-35,758	-110,271
% Difference from Baseline			-13.3%	-26.9%	-30.9%	-17.1%	-52.8%
Cumulative NFOI, All Farms	\$ bil (48 mos)	36.4	28.7	25.0	28.0	29.9	19.8
Difference from Baseline			-7.7	-11.3	-8.4	-6.5	-16.5
% Difference from Baseline			-21.2%	-31.2%	-23.1%	-17.8%	-45.4%
Value of US Exports	\$ bil (48 mos)	53.0	32.5	31.4	45.3	46.7	31.7
Difference from Baseline			-20.5	-21.6	-7.8	-6.3	-21.4
% Difference from Baseline			-38.6%	-40.7%	-14.6%	-11.9%	-40.3%
Cheese Sales Revenues	\$ bil (48 mos)	31.2	28.0	28.2	29.9	29.2	27.2
Difference from Baseline			-3.1	-2.9	-1.2	-1.9	-4.0
% Difference from Baseline			-10.0%	-9.4%	-3.9%	-6.2%	-12.7%

Modeled Outcome	Units	Baseline	Trade Policy With Feed Cost Change	Trade Policy No Feed Cost Change	Immigration Policy	Food and Nutrition Policy	Combined Policies
Retail Fluid Milk Price	\$/gallon	3.37	3.16	3.22	3.49	3.27	3.37
Difference from Baseline			-0.22	-0.16	0.12	-0.10	0.00
% Difference from Baseline			-6.4%	-4.6%	3.5%	-2.9%	0.0%
Wholesale American Cheese Price	\$/lb	1.82	1.62	1.66	1.79	1.73	1.68
Difference from Baseline			-0.20	-0.16	-0.03	-0.09	-0.14
% Difference from Baseline			-11.1%	-8.7%	-1.8%	-4.9%	-7.5%

Table 3. Simulation Model Estimates of the Impacts of Representative Policy Options with Compensatory Payments

Modeled Outcome	Units	Baseline	Combined Policies	Combined Policies with Payment \$0.50 per cwt	Combined Policies with Payment \$1.00 per cwt	Combined Policies with Payment \$2.00 per cwt
All Milk Price	\$/cwt	20.92	19.90	19.52	19.16	18.41
Difference from Baseline			-1.02	-1.40	-1.76	-2.51
Difference from Combined Policies				-0.38	-0.74	-1.49
Class III Price	\$/cwt	18.48	16.32	16.05	15.80	15.38
Difference from Baseline			-2.16	-2.43	-2.67	-3.09
Difference from Combined Policies				-0.27	-0.52	-0.94
Total US Milk Production	bil lbs per year	269.1	238.8	241.9	245.1	251.7
Difference from Baseline			-30.3	-27.2	-24.0	-17.4
Difference from Combined Policies				3.1	6.2	12.8
Net Farm Operating Income, Medium Farm	\$/farm/year	208,685	98,414	112,365	127,712	158,267
Difference from Baseline			-110,271	-96,320	-80,972	-50,418
Difference from Combined Policies				13,951	29,299	59,853
Cumulative NFOI, All Farms	\$ bil (48 mos)	36.4	19.8	21.7	23.7	27.6
Difference from Baseline			-16.5	-14.6	-12.6	-8.8
Difference from Combined Policies				1.9	3.9	7.8
Value of US Exports	\$ bil (48 mos)	53.0	31.7	32.2	32.8	34.2
Difference from Baseline			-21.4	-20.8	-20.2	-18.9
Difference from Combined Policies				0.6	1.2	2.5
Cheese Sales Revenues	\$ bil (48 mos)	31.2	27.2	27.1	27.0	26.8
Difference from Baseline			-4.0	-4.0	-4.1	-4.3
Difference from Combined Policies				-0.1	-0.1	-0.4

Modeled Outcome	Units	Baseline	Combined Policies	Combined Policies with Payment \$0.50 per cwt	Combined Policies with Payment \$1.00 per cwt	Combined Policies with Payment \$2.00 per cwt
Retail Fluid Milk Price	\$/gallon	3.37	3.37	3.34	3.31	3.25
Difference from Baseline			0.00	-0.03	-0.06	-0.12
Difference from Combined Policies				-0.03	-0.06	-0.12
Wholesale American Cheese Price	\$/lb	1.82	1.68	1.66	1.63	1.59
Difference from Baseline			-0.14	-0.16	-0.19	-0.23
Difference from Combined Policies				-0.03	-0.05	-0.09
Cost of Compensatory Government Payments	\$ bil (48 mos)	0.0	0.0	4.6	9.4	19.3