

Analysis of Proposed Programs to Mitigate Price Volatility in the U.S. Dairy Industry

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Executive Summary

Volatility of prices and incomes has been an issue of importance for the U.S. dairy industry since the early 1990s. Much of this volatility appears to arise in the dairy supply chain, particularly the production sector, consistent with observed patterns of behavior for other commodities (both agricultural and non-agricultural). Volatility in prices and incomes has been brought to the fore by recent events, especially a prolonged period of inadequate income for many dairy farmers during 2008 to 2009. There are likely high costs associated with price and income volatility throughout the U.S. dairy supply chain, but accurate estimates of these costs do not currently exist. Given the costs, a number of programs have been proposed in recent years with the objective of reducing variation in milk prices and farm income. Key questions related to these programs are: 1) can they be effective at reducing variation in prices and income? and 2) do they have other effects that industry organizations consider either positive or negative?

This report summarizes our analysis of the three main programs currently proposed as mechanisms to reduce price and income variability:

- Legislation introduced by Costa (H.R. 5288) and Sanders (S. 3531) (hereafter CS);
- The Marginal Milk Pricing (MMP) program proposed by Agri-Mark;
- Elements of the Foundation for the Future (FFTF) program proposed by the National Milk Producers Federation.

Our analyses employ a complex systems modeling approach previously used for many other commodities that represents the U.S. dairy supply chain in significant detail. Although the analysis is undertaken at a national level, the model incorporates many product categories (intermediate and final), all current national dairy policies, a trade sector that accounts for interactions with the rest of the world and detailed representation of the proposed programs.

We compare the outcomes of each of the programs to a Baseline scenario (which assumes continuation of current policies and no new programs) for the period 2010 to 2018. We undertake this comparison assuming no shocks, a single large shock to feed costs and export demand, and a set of stochastic shocks for which the timing and magnitude of changes in feed cost and export demand are randomly chosen for 200 simulations. These shocks are not forecasts of the future, but represent the types and magnitude of shocks that may occur during the next 9 years. We also explore the impact of selected alternative program implementations and behavioral assumptions.

Our assessment focuses on the level and variation in the all milk price, the level of milk income less feed costs for dairy herds of a constant size, milk marketed, government expenditures, net exports of three key dairy products (American cheese, NDM and dry whey) and total sales of fluid milk and American cheese. These indicators provide a spectrum of outcomes of interest to dairy producers, processors, consumers and government policy makers.

Key Results

- All three programs would reduce milk price volatility significantly compared to the Baseline, both with and without shocks. Under the assumption of large shocks, the programs would reduce the average absolute deviation from \$1.75/cwt to \$1.26/cwt, \$1.25/cwt and \$1.13/cwt, respectively;
- Cumulative milk production from 2010-18 would be reduced by 0.4% to 0.7% under the MMP and FFTF (range with and without shocks). Milk production would be increased 0.6% to 0.8% under CS with assumed program parameters;
- All three programs would reduce government expenditures for dairy programs significantly. Under the assumption of large shocks, government expenditures would be reduced from about \$3.2 billion over 2010-18 to \$1.6 billion for MMP and FFTF and \$1.1 billion for CS;
- The Marginal Milk Pricing (MMP) and the Foundation for the Future (FFTF) programs would increase the average All-Milk price by \$0.23 and \$0.17/cwt, respectively without shocks, and by \$0.12/cwt and \$0.06/cwt, respectively, with shocks. These price enhancement effects occur because MMP and FFTF spend collected monies on demand enhancing activities (modeled as food donations through non-commercial channels);
- The programs would have different effects on net exports of American cheese, NDM and dry whey. Under the scenarios assuming the large shock, the MMP and FFTF would reduce average monthly net exports of American cheese by 17% and 22% respectively, compared to the Baseline. Net exports would continue to grow under the programs, just a slower rate than under the Baseline. Moreover, the lower exports under MMP and FFTF would be offset to some degree by additional purchases for domestic markets. Average monthly dry whey exports would be reduced by 3.1% and 2.8% under MMP and FFTF, respectively. Because CS produces somewhat more milk than the Baseline, American cheese exports and dry whey exports would increase by 2.6% and 8.1% respectively, compared to the Baseline.
- The impact of the programs on cumulative fluid sales during 2010-18 would be less than 0.4% (the reduction under FFTF). The impact on cumulative domestic and export sales of American and other varies with the program. MMP and FFTF would reduce cumulative American cheese sales by 1.7% and 0.7% respectively. Reductions in cumulative other cheese sales would be 0.2% and 0.3% for MMP and FFTF, respectively. CS would increase cumulative sales of fluid milk by 0.2%, but decreases American cheese and other cheese by 0.5%, 1.0%, respectively.
- The programs would have different effects on Class III and IV prices. Due to purchases of American cheese, the MMP and FFTF programs tend to enhance Class III prices compared to the Baseline (an average over 2010-18 of \$0.45/cwt and \$0.57/cwt, respectively) for the scenario assuming large shocks. Average Class IV prices are higher under MMP (\$0.09/cwt for 2010-18) and lower under FFTF (\$0.04/cwt) compared to the Baseline for the scenario assuming large shocks, which implies a larger average price spread between Class III and IV. The CS tends to lower both Class III and IV prices (\$0.14/cwt and \$0.20/cwt) for 2010-18 assuming large shocks, but maintains a smaller price spread.

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