# Market Impacts of the Dairy Security Act of 2011 (H.R.3062) and the Dairy Provisions of the Rural Economic Farm and Ranch Sustainability and Hunger Act of 2011 (S.1658)

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## Summary

Two proposed pieces of dairy legislation could reduce variation in U.S. milk prices, reduce average milk and product prices, have different impacts on government expenditures, and would not markedly affect milk marketed during the period 2012 to 2018. The programs would reduce the value of U.S. dairy exports, but also reduce the value of U.S. dairy imports. There are few differences in outcomes between the legislation, despite different provisions with regard to suspension of supply management programs.

## Introduction

Alternatives to current U.S. dairy policies are receiving a great deal of discussion at present, but there has been limited formal assessment of the market impacts. This document provides a brief summary of key market outcomes for two recently-introduced pieces of legislation, the Dairy Security Act of 2011 (H.R. 3062, referred to DSA in this document) and the dairy-related provisions of the Rural Economic Farm and Ranch Sustainability and Hunger Act of 2011 (S.1658, referred to as REFRESH). This analysis focuses on market impacts such as prices, price variability, total milk marketed, government expenditures, and the total value of U.S. dairy product exports. A companion document focuses on farm-level financial impacts.

## Methods Used

The methods used for the dynamic analysis of the scenarios are based on a previously-developed dynamic model of the U.S. dairy sector (detailed discussion is available in Nicholson and Stephenson, 2010[2]). The model represents milk supply, product demand, trade policy and U.S. dairy policy elements, aggregated at the national level. The model was modified to include voluntary participation in the Dairy Producer Margin Protection Program (DPMPP) and the Dairy Market Stabilization Program (DMSP) components of the proposed legislation, and also includes outcomes for "representative" farms, which in this case means farms who maintain the same average herd size for the period under analysis. The model represents all of the essential provisions of the proposed programs, including the time delays involved in implementing DMSP.

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[2] http://dairy.wisc.edu/pubPod/pubs/Analyses_of_Volatility_Programs.pdf

**Scenarios Analyzed**

The model analyzes five scenarios, including a *Baseline* that assumes continuation of current programs. For the DSA and REFRESH programs, assumptions must be made about the extent of dairy farmer participation in the voluntary DPMPP (and therefore DMSP) components of the proposed legislation. In the modeling framework, these assumptions are:

- The *proportion of farms* in each size class that choose to participate;

- The *margin level* participating farms choose to protect with supplemental insurance;

- The *proportion of the farm's milk* production that will be covered by supplemental insurance;

Each of these assumptions about how producers will respond to the program is highly uncertain, which makes assessment of the programs challenging. We address this by choosing what we believe are appropriate upper and lower bounds on these participation decisions, creating "low participation" and "high participation" scenarios. These two scenarios are then examined for both the DSA and the REFESH proposed legislation. For consistency with previous analyses, we assume program implementation in January 2012, and analyzed outcomes through the end of December 2018. The five scenarios analyzed are:

- *Baseline*: continuation of current dairy programs, with scheduled modifications to existing programs like MILC;

- *DSA Low Participation*: Eliminates DPPSP, MILC and DEIP and replaces them with the DPMPP and DMSP programs in January 2012. Low participation assumes that 10% of small farms (0-249 cows), 5% of medium farms (250-499 cows), 2.5% of large farms (500-1999 cows) and 1% of extra large farms (2000 or more cows) participate. All farms are assumed to cover 50% of their milk at the $5 margin level;

- *REFRESH Low Participation*: As assumed for *DSA Low Participation*, but with the DMSP suspension triggers based on the relationship between world and U.S. prices for Cheese and NDM from S.1658 (REFRESH) rather than H. R.3062 (DSA);

- *DSA High Participation*: Eliminates DPPSP, MILC and DEIP and replaces them with the DPMPP and DMSP programs in January 2012. High participation assumes that 50% of ALL farms cover 60% of their milk at the $6 margin level[3];

- *REFRESH High Participation*: As assumed for *DSA High Participation*, but with the DMSP suspension triggers based on the relationship between world and U.S. prices for Cheese and NDM from S.1658 rather than H. R.3062.

**Results**

The key findings of our analysis of these programs are below (and in more detail in Table 1):

- The proposed programs can reduce the variation in the average U.S. All-milk price, and are more effective with larger the participation of dairy farmers;

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[3] Thus, this scenario is roughly consistent with the assumptions made by the Congressional Budget Office in "scoring" the legislation.

- The proposed programs would reduce the average U.S. All-milk price (Figure 1), the Class III price and the Class IV price, in part because they limit price variability. Previous analyses have suggested that greater variability results in higher average prices over time, which is consistent with the inelastic demand[4] for U.S. dairy products;

- There are few differences in outcomes between the DSA and the REFRESH due to the different provisions for suspension of the DMSP related to the relationship between U.S. and world market prices for cheese and NDM. As noted in the companion document *Provisions of the Dairy Security Act of 2011 (H.R.3062) and the Dairy Provisions of the Rural Economic Farm and Ranch Sustainability and Hunger Act of 2011 (S.1658)*, the conditions required for triggering a suspension under the REFRESH provision have not been met during the past five years, but given the more volatile nature of world dairy product markets and the enhanced US role as an exporter, our analysis may understate the potential differences.

- Government expenditures under the DPMPP will vary a great deal depending on the participation decisions of dairy farmers (Figure 2). Under low participation, expenditures total $61 million from 2012 to 2018, but under high participation, expenditures are $824 million during this period. The latter value is considerably more than the proposed spending authority for dairy programs and the CBO score for the legislation (at a comparable level of participation), but is also considerably less than in the Baseline scenario.

- Total milk marketed per year on average during 2012 to 2018 *increases* a small amount under the programs, less than 2 billion lbs per year (less than 1% of production). This increase occurs despite the frequent activation of the DMSP;

- The DMSP would be active between 40 and 45% of the time under the $6 margin trigger value. This frequency is greater than what would have been observed during the past decade, but the DMSP is likely to change the trajectory of future prices so that past outcomes may not be a particularly good guide to future outcomes. The frequency with which the program is active also is due in part to our result that the programs would yield a lower average milk price[5].

- The average annual *value* of U.S. net exports (export value less import value for all dairy products) would increase under the DSA and the REFRESH legislation, in part due to lower average prices. Changes in the *volume* of cumulative U.S. net exports due to the DSA or REFRESH are small for cheese, NDM and dry whey, although the reduction in

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[4] Inelastic demand means that the percentage change in sales is less than the percentage change in price. This means that price increases result in smaller reductions in sales than if demand is "elastic." It is a basic economic result that increasing prices when demand is inelastic will increase industry revenues because the increase in price more than offsets the decline in sales.

[5] One reason for the lower milk prices is that our model endogenously predicts monthly prices based on producer decision-making that is quite responsive to profitability. (This is consistent with the observed price cycles in the industry in the past decade.) Other analyses assume that both milk prices and feed costs are random, but without the same monthly time horizon for decision-making and linkages over time. Thus, our model predicts a larger response to the incentives and payments under DSA and REFRESH.

volatility alters the pattern of sales over time.  U.S. domestic consumption is also slightly higher because of somewhat lower product prices.


**Concluding Comments and Limitations**

Our analyses suggest that some of the desired outcomes of the proposed DSA and REFRESH legislation will be achieved, perhaps most importantly reduced variation in U.S. milk prices. However, the degree to which price variation is reduced depends strongly on the participation decisions of farmers.  In addition, our assumptions about the participation parameters may be conservative for the purposes of assessing potential government budgetary exposure.  Decisions by producers to protect more than the 60% of production and at higher margins than we assumed would result in additional government expenditures, especially under the "high participation" scenarios.  In addition, our analyses do not assess the effectiveness of the proposed legislation in the face of shocks such as feed cost increases or rapid changes (up or down) in export demand. Thus, our analysis should be considered as suggestive of the likely impacts of the proposed programs, rather than as definitive predictions of the next 7 years were these programs to be in place.

**Table 1. Simulated Market Outcomes, Baseline and Four Policy Scenarios**

| Outcome | Units | Baseline | DSA Low | REFRESH Low | DSA High | REFRESH High |
|---|---|---|---|---|---|---|
| All-milk price, average 2012-2018 | $/cwt | 15.92 | 15.39 | 15.39 | 15.00 | 15.00 |
| Deviation in All-milk price, average 2013-2018 | $/cwt | 2.13 | 1.55 | 1.55 | 0.40 | 0.40 |
| Class III price, average 2012-2018 | $/cwt | 13.70 | 13.53 | 13.53 | 13.52 | 13.52 |
| Class IV price, average 2012-2018 | $/cwt | 13.58 | 13.25 | 13.25 | 12.98 | 12.98 |
| Government expenditures, 2012-2018 | $ mil | 1,514 | 61 | 61 | 824 | 824 |
| Total milk marketed, average 2012-2018 | bil lbs/year | 200.3 | 201.6 | 201.6 | 203.6 | 203.6 |
| Value of U.S. Net Exports, average 2012-2018 | $ mil/year | 659 | 980 | 979 | 1,337 | 1,337 |
| Proportion Time Program Active, 2012-2018 | % | 0.0 | 39.0 | 38.8 | 46.2 | 46.2 |
| | | | | | | |
| *Difference from Baseline* | | | | | | |
| All-milk price, average 2012-2018 | $/cwt | | -0.53 | -0.53 | -0.92 | -0.92 |
| Deviation in All-milk price, average 2013-2018 | $/cwt | | -0.58 | -0.58 | -1.73 | -1.73 |
| Class III price, average 2012-2018 | $/cwt | | -0.17 | -0.17 | -0.18 | -0.18 |
| Class IV price, average 2012-2018 | $/cwt | | -0.33 | -0.33 | -0.60 | -0.60 |
| Government expenditures, 2012-2018 | $ mil | | -1,453 | -1,453 | -690 | -690 |
| Total milk marketed, average 2012-2018 | bil lbs/year | | 1 | 1 | 3 | 3 |
| Value of U.S. Net Exports, average 2012-2018 | $ mil/year | | 321 | 320 | 678 | 678 |
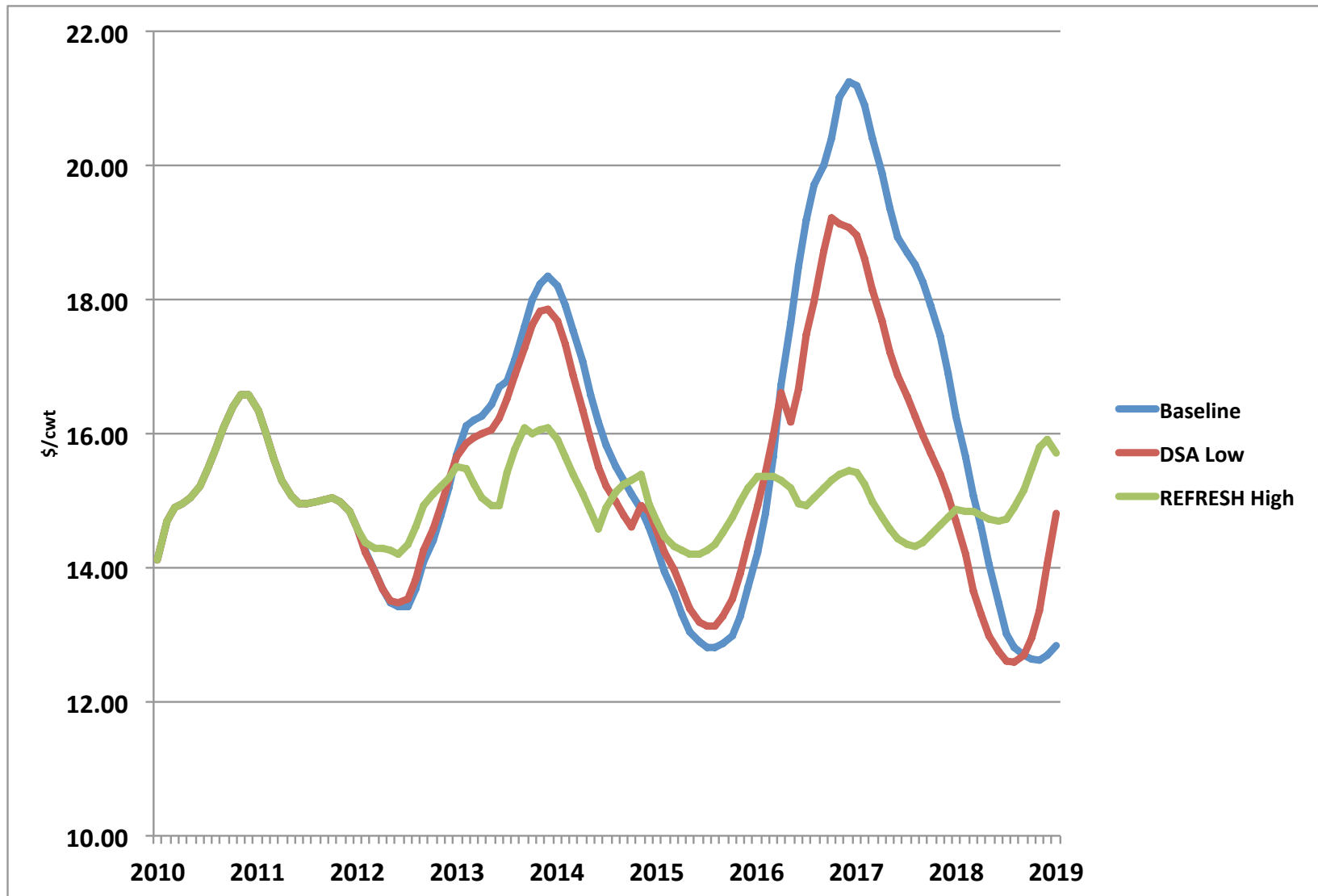
**Figure 1. Simulated U.S. All Milk Price, Baseline and Two Policy Scenarios**
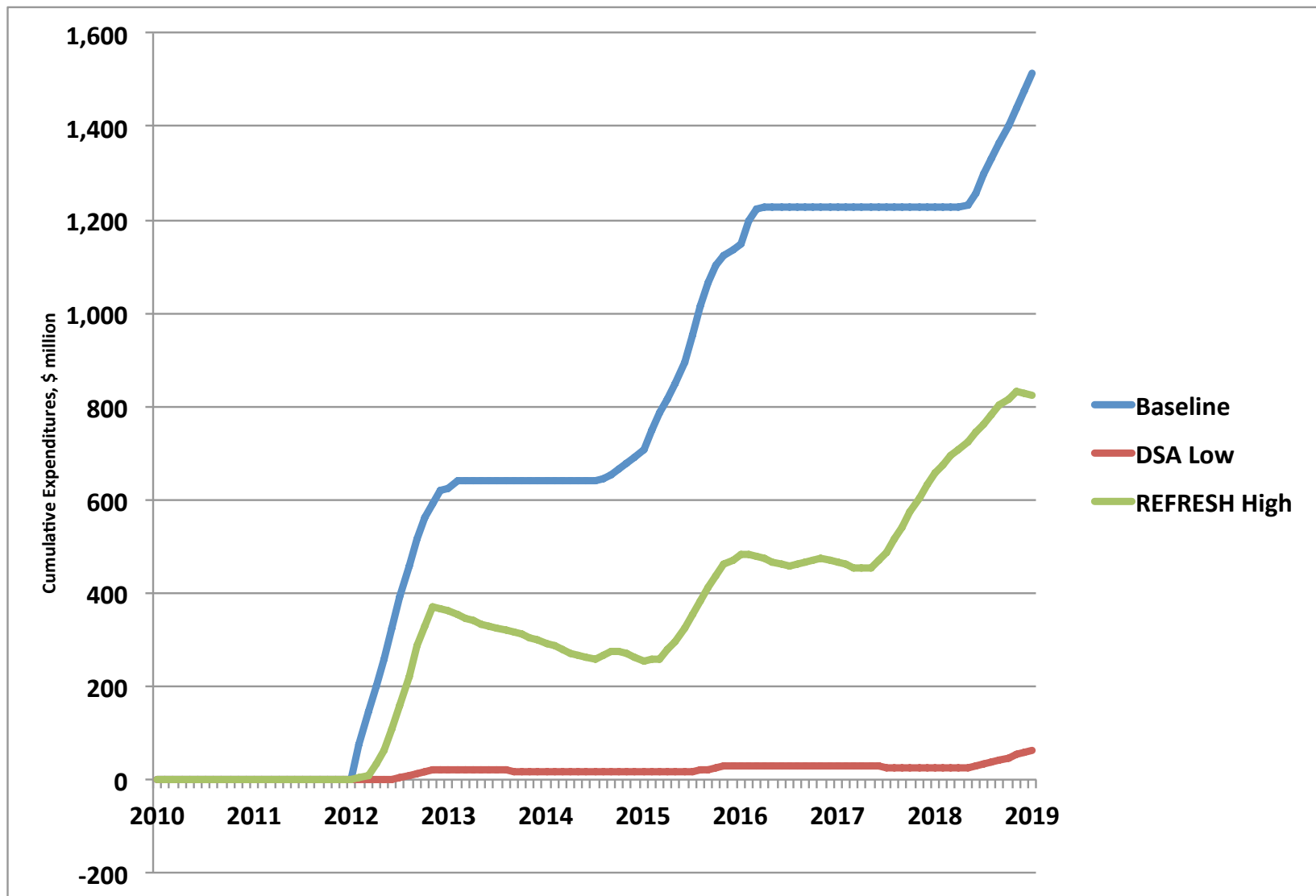
**Figure 2. Simulated Cumulative Government Expenditures 2012 to 2018, Baseline and Two Policy Scenarios**