FARM LEVEL IMPACTS OF EFFECTS OF A MODIFIED DAIRY SECURITY ACT OF 2011

Agricultural and Food Policy Center
Texas A&M University

April 2012
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Research Report 12-1

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FARM LEVEL IMPACTS OF EFFECTS OF A MODIFIED DAIRY SECURITY ACT OF 2011

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Executive Summary

The report analyzed the effect of the modified Dairy Security Act of 2011 (MDSA2011) provisions that was discussed in late 2011 on individual dairy farms using data on 22 actual representative dairy farms developed and maintained by AFPC. These representative dairy farms vary significantly in size and are distributed throughout the United States.

The following are the some of the key conclusions of the study:

1) The overwhelming majority (19 out of 22) of the representative farms would have higher net cash farm income over the study period under the MDSA2011 proposed policy relative to current policy. Eleven dairies would choose the $6.50 buy-up level and 8 would choose $5.00 buy-up level as their most preferred option. The remaining three would choose non-participation as their preferred option.

2) In general, the current policy alternative (option 1) was among the least preferred across the representative dairies.

3) Sector level analysis from Brown indicates that MDSA2011 will result in very minor changes in milk prices and milk production, compared with current dairy policy.

4) Although the analysis formally assumes that the milking herd sizes of the representative farms remains constant throughout the analysis period (2009-2016), it was determined that the results would not change under a more general assumption of herd size growth.
This report provides the results of farm level analyses of the modified Dairy Security Act of 2011 provisions that was discussed in late 2011. This analysis is a companion to the sector level analysis of these provisions developed by Brown. The sector level results were utilized in this analysis and imposed on the representative dairy farms maintained by the Agricultural and Food Policy Center at Texas A&M University. Detailed descriptions of the sector results are contained in the report, The Effects of a Modified Dairy Security Act of 2011 on Dairy Markets.

AFPC Panel Process

AFPC has developed and maintains data to simulate 22 representative dairy farms in the major production areas across the United States (Figure 1). Characteristics for each of the operations in terms of location, size, and crop mix are summarized in Appendix A. More detailed information on the farms are contained in Richardson, et al., 2012.

The locations of these farms are primarily the result of past discussions with staff members of the U.S. House and Senate Agriculture Committees. Information necessary to simulate the economic activity on these representative farms is developed from panels of producers using a consensus-building interview process. Often, two farms are developed in each region using separate panels of producers: one is representative of moderate size full-time farm operations, and the second panel usually represents farms two to three times larger.

The data collected from the panel farms are analyzed using the whole farm simulation model (FLIPSIM) developed by AFPC. The producer panels are provided pro-forma financial statements for their representative farm and are asked to verify the accuracy of simulated results for the past year and the reasonableness of a multi-

Figure 1. Location and Size of AFPC Representative Dairies.
year projection. Each panel must approve the model’s ability to reasonably reflect the economic activity on their representative farm prior to using the farm for policy analyses.

Initial debt levels for dairy farms were set at 30 percent. The debt levels the farms have at the outset of 2009 are based on a stratified tabulation of the ERS-USDA Farm Cost and Returns Survey (using the survey data for moderate to large size farms in states where AFPC has representative farms) and panel member input.

**Panel Member Input**

AFPC often gets asked to analyze policy changes on our representative farms and the results often hinge on the assumptions made for the analysis. We often fact check our assumptions with our panel members or at least try to get a feel from them for how they might react to a policy change. The significance of the changes being analyzed in this report prompted us to seek our panel member input via an email survey. These email surveys are not meant to represent a scientific sample, but rather provide anecdotal information and raise issues for both policy makers and modelers to address. The dairy producers were asked whether they would participate in the potential program laid out under the Modified Dairy Security Act. In general, the responses were pretty evenly split between intending to participate and not participating. It was clear that many producers were not fully aware of the dairy provisions of the bill presented to the Supercommittee. There was a clear indication that producers needed more information about the details of the provision to make an informed decision. Some reasons listed for potential lack of participation in the program were: too complicated, potential to hurt export markets, and doubting the market stabilization portion of the program would work if not full participation. On the question of what information the producers need to make a decision on whether to buy-up coverage and at what level, the most mentioned responses included: futures prices for both milk and feed, their operations cost of production, and premium costs. The results of our ad hoc survey suggested that more analysis, such as this study were indeed needed to help producers more fully understand the economic implications of the modified Dairy Security Act.

Brief descriptions of assumptions that apply to all alternatives are as follows:

1) The study period runs from 2009 to 2016. Several years of history are included to ensure the results are tracking what actually occurred in the industry appropriately. Several common financial condition measures are reported for each representative dairy as of the end of 2016.

2) The milking herd size remains constant throughout the study period.

3) Milk production is expected to increase at 1.5% annually.

Brief descriptions of alternatives analyzed in this report are as follows:

1. **Current Policy.** Assumes that a new farm bill reauthorizes MILC and other farm programs included in baseline projections by the Congressional Budget Office (CBO) without changing program provisions. This means that MILC payments are limited to 2.4 million pounds of milk, the feed cost adjustor is raised to $9.50, and payments are made on 34% of the difference between the $16.94 base price and the class 1 Boston price.

2. **Non-Participant.** Assumes that a new farm bill puts in place the provisions of the Dairy Security Act, but that individual representative dairies choose not to participate in the margin protection and market stabilization.

3. **Participant Base Coverage.** Assumes that each representative dairy chooses to participate in margin protection, but only at the basic level (no buy-up). Applicable reductions in dairy payments occur when the margin has been $6.00/cwt or less for the immediately preceding two months or $4.00/cwt or less for the immediately preceding month.

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1 Several farms were analyzed to determine whether their preferences would change under a herd growth scenario. The preferred choice for these farms did not change from the constant herd size analysis.
4. **Participant Buy-up $4.50 Coverage.** Individual representative dairies are simulated at the $4.50 margin buy-up covering 90% of their annual production history. Premium payments correspond to rates found in Tables 1 and 2. Applicable reductions in dairy payments occur when the margin has been $6.00/cwt or less for the immediately preceding two months or $4.00/cwt or less for the immediately preceding month.

5. **Participant Buy-up $5.00 Coverage.** Individual representative dairies are simulated at the $5.00 margin buy-up covering 90% of their annual production history. Premium payments correspond to rates found in Tables 1 and 2. Applicable reductions in dairy payments occur when the margin has been $6.00/cwt or less for the immediately preceding two months or $4.00/cwt or less for the immediately preceding month.

6. **Participant Buy-up $5.50 Coverage.** Individual representative dairies are simulated at the $5.50 margin buy-up covering 90% of their annual production history. Premium payments correspond to rates found in Tables 1 and 2. Applicable reductions in dairy payments occur when the margin has been $6.00/cwt or less for the immediately preceding two months or $4.00/cwt or less for the immediately preceding month.

7. **Participant Buy-up $6.00 Coverage.** Individual representative dairies are simulated at the $6.00 margin buy-up covering 90% of their annual production history. Premium payments correspond to rates found in Tables 1 and 2. Applicable reductions in dairy payments occur when the margin has been $6.00/cwt or less for the immediately preceding two months or $4.00/cwt or less for the immediately preceding month.

8. **Participant Buy-up $6.50 Coverage.** Individual representative dairies are simulated at the $6.50 margin buy-up covering 90% of their annual production history. Premium payments correspond to rates found in Tables 1 and 2. Applicable reductions in dairy payments occur when the margin has been $6.00/cwt or less for the immediately preceding two months or $4.00/cwt or less for the immediately preceding month.

9. **Participant Buy-up $7.00 Coverage.** Individual representative dairies are simulated at the $7.00 margin buy-up covering 90% of their annual production history. Premium payments correspond to rates found in Tables 1 and 2. Applicable reductions in dairy payments occur when the margin has been $6.00/cwt or less for the immediately preceding two months or $4.00/cwt or less for the immediately preceding month.

10. **Participant Buy-up $7.50 Coverage.** Individual representative dairies are simulated at the $7.50 margin buy-up covering 90% of their annual production history. Premium payments correspond to rates found in
Tables 1 and 2. Applicable reductions in dairy payments occur when the margin has been $6.00/cwt or less for the immediately preceding two months or $4.00/cwt or less for the immediately preceding month.

11. Participant Buy-up $8.00 Coverage. Individual representative dairies are simulated at the $8.00 margin buy-up covering 90% of their annual production history. Premium payments correspond to rates found in Tables 1 and 2. Applicable reductions in dairy payments occur when the margin has been $6.00/cwt or less for the immediately preceding two months or $4.00/cwt or less for the immediately preceding month.

**Results**

AFPC applied the sector level results developed in Brown’s analysis for the set of 22 representative dairy farms located across the United States, using AFPC’s farm level simulation model for this analysis.

The farm level results reflect actual dairy data developed in our representative farm process. The representative dairies are all analyzed under each of the alternative scenarios described above. The sector level results provided by Brown reflect sector level supply response analyzing current policy as the baseline alternatives based on analysis of the provisions of the DSA.

Table 3 contains the rankings of the 11 alternatives (defined above) for each of the representative dairies. The rankings are based on average Net Cash Farm Income (NCFI) from 2012 to 2016 for each alternative. The alternative with the highest NCFI was given the highest ranking of 1. The next highest NCFI was given a ranking of 2 and so forth, all the way to 11. Table 3 reveals that 11 of the 22 dairies have the highest average NCFI under the $6.50 buy-up alternative (option 8 described above) followed closely with 8 dairies having the highest average NCFI under the $5.00 buy-up alternative (option 5). The large Missouri grazing dairy (MOGD550) and both Florida dairies received the largest average NCFI under the Non-Participant alternative.
In order to convey the magnitude between alternatives, the difference between the highest NCFI option and the next best alternative is presented in Figure 2. The color code in Figure 2 relates to the next best option. The results indicate the average difference per year over the 2012 to 2016 study period. The large Florida dairy shows the largest difference between its highest NCFI alternative (Non-Participation) and its next best option ($6.50 buy-up) at $13,600/year. Conversely, there are 10 dairies that show less than a $1,000/year difference.

Figures 3 and 4 also show magnitude of differences between alternatives. Figure 3 shows the annual average difference in NCFI between the Preferred option and Non-Participation. Three dairies (the large MOGD and both Florida dairies) indicate $0 difference because their preferred option was Non-Participation. Idaho has the largest average annual NCFI difference at $53,500. In general, given the analysis of margin volatility and the ability of the policy options to provide a safety net for that volatility combined with the affects of market stabilization, the analysis suggests that the costs of non-participation for a dairy would be significant especially for the larger dairies.

Figure 4 shows the differences for each dairy between their Preferred option and Current Policy alternatives. These results are similar as those in Figure 3, as most dairies have Non-Participation and Current Policy ranked closely in their order of preference. For example, the large Wisconsin dairy has a $14,600 difference between the non-participation ($18,300) and the current policy baseline option ($32,900). The smaller Wisconsin dairy has a very small difference between these same options. Non-participation tends to have the smaller NCFI difference from either of the preferred buy-up options ($6.50 or $5.00) than does the current program. That implies that non-participants in the new program would experience higher NCFI's than otherwise achieved under the current program.

Table 4 contains the average annual premium, lost marketings, and indemnity payments during the 2012 to 2016 study period. This table is a complement to Table 3 as it gives detail to the representatives dairies highest NCFI.
Figure 3. Difference in $1,000s in Average Annual NCFI between the Preferred Option and Non-Participation.

Figure 4. Difference in $1,000s in Average Annual NCFI between the Preferred Option and Current Policy.
for each alternative. For most dairies, the expected average annual indemnity payments outweigh, or exceed, the lost income triggered by the market stabilization and premium payments combined.

Table 5 contains the average annual milk prices for states where representative dairies are located assuming continuation of current policies. Table 6 contains the average annual milk prices for the same states assuming that the modified DSA is in effect for the 2012 to 2016 study period. The annual average milk prices in Tables 5 and 6 are averages from a risk-based analysis which simulated 500 different possible future paths for demand and production of crops, livestock, and milk; and thus 500 different paths of annual prices for feed and milk. The 500 sector level price paths were developed by Brown for the current farm program and DSA program both used the same risk so the only differences in prices is attributable to the policy change. The 500 possible price paths for dairy feed prices and milk prices simulated by Brown are appropriately correlated based on historical correlation among these variables. The farm level analyses used Brown’s 500 price paths so the DSA premiums and indemnities were calculated using a wide range of possible projections for milk and feed prices, that were correlated based on historical relationships. By using the 500 draws of prices, the results of the farm level analysis are more robust than if the policies were simply analyzed using only the average prices.

Table 7 is related to the previous two tables as it shows the difference in prices between the DSA and current policy for each state (DSA prices minus Current policy). Current Policy (Baseline) milk prices and those projected under the DSA are projected by Brown.

Summary and Conclusions

AFPC analyzed the modified Dairy Security Act of 2011 provisions that was discussed in late 2011 utilizing our set of 22 representative dairy farms located in 10 states across the U.S. Each farm was simulated 500 times each year in AFPC’s farm level simulation model (FLIPSIM) to incorporate risk in commodity prices and crop and milk yields into the analysis. Each farm was analyzed under 11 options from current policy (MILC) (option 1), to the modified DSA scenario as a non-participant (option 2), to participation at the base level of margin coverage (option 3), to 8 buy-up alternatives (options 4 – 11).
The options were ranked for each farm based on average Net Cash Farm Income (NCFI) from 2012 to 2016 for each alternative. Eleven of the 22 dairies have the highest average NCFI under the $6.50 buy-up alternative (option 8) with 8 additional dairies having the highest NCFI under the $5.00 buy-up alternative (option 5). Only the large Missouri grazing dairy and both Florida dairies received the largest average NCFI under a different alternative (option 2 - Non-Participation). For most of the farms, the second best option was a slightly lower buy-up level. In general, the current policy alternative (option 1) was among the least preferred.
References


CAD1710  A 1,710-cow, large-sized central California (Tulare County) dairy, the farm plants 1,200 acres of hay/silage for which it employs custom harvesting. Milk sales generated 94 percent of 2011 total receipts.

WAD250   A 250-cow, moderate-sized northern Washington (Whatcom County) dairy. This farm plants 200 acres of silage and generated 92 percent of its 2011 gross receipts from milk sales.

WAD850   An 850-cow, large-sized northern Washington (Whatcom County) dairy. This farm plants 605 acres for silage annually. During 2011, 95 percent of this farm’s gross receipts came from milk.

IDD3000  A 3,000-cow, large-sized dairy located in the Magic Valley of Idaho (Twin Falls County). This farm plants 1,250 acres of corn silage annually. Milk sales account for 94 percent of 2011 gross receipts.

NVD500   A 500-cow, moderate-sized Nevada (Churchill County) dairy. This farm plants 150 acres of hay and 100 acres of corn silage annually. Milk sales accounted for 93 percent of NVD500’s gross receipts for 2011.

TXND3000 A 3,000-cow, large-sized dairy located in the South Plains of Texas (Bailey County). This farm plants 1,440 acres of corn silage annually. Milk sales account for 93 percent of 2011 gross receipts.

TXCD550  A 550-cow, moderate-sized central Texas (Erath County) dairy, TXCD550 plants 1,100 acres of hay each year. Milk sales represented 93 percent of this farm’s 2011 gross receipts.

TXCD1300 A 1,300-cow, large-sized central Texas (Erath County) dairy, TXCD1300 plants 680 acres of silage and 440 acres of hay annually. During 2011, milk sales accounted for 93 percent of receipts.

TXED400  A 400-cow, moderate-sized northeast Texas (Hopkins County) dairy. This farm has 400 acres of silage and 125 acres of hay. During 2011, milk sales represented 87 percent of annual receipts.

TXED1000 A 1,000-cow, large-sized northeast Texas (Hopkins County) dairy. This farm plants 1,025 acres of hay/silage. This farm generated 95 percent of 2011 receipts from milk sales.

WID145   A 145-cow, moderate-sized eastern Wisconsin (Winnebago County) dairy, the farm plants 180 acres of silage, 90 acres for hay, 150 acres of corn, and 130 acres of soybeans. Milk constituted 84 percent of this farm’s 2011 receipts.

WID1000  A 1000-cow, large-sized eastern Wisconsin (Winnebago County) dairy, the farm plants 600 acres of hay, 600 acres of silage, 600 acres of corn and 100 acres of soybeans each year. Milk sales comprised 92 percent of the farm’s 2011 receipts.
Appendix A. 2011 Characteristics of Panel Farms Producing Milk (continued)

NYWD600  A 600-cow, moderate-sized western New York (Wyoming County) dairy. This farm plants 600 acres of silage, 450 acres of haylage, 100 acres of corn, and 50 acres of hay annually. Milk sales accounted for 91 percent of the gross receipts for this farm in 2011.

NYWD1200  A 1,200-cow, large-sized western New York (Wyoming County) dairy. This farm plants 1,900 acres of silage and 200 acres of corn annually. Milk sales accounted for 93 percent of the gross receipts for this farm in 2011.

NYCD110  A 110-cow, moderate-sized central New York (Cayuga County) dairy, the farm plants 30 acres for hay, 90 acres for corn, and 185 acres for silage annually. Milk accounted for 92 percent of the gross receipts for 2011 on this dairy.

NYCD550  A 550-cow, large-sized central New York (Cayuga County) dairy, this farm plants 625 acres of hay and haylage and 475 acres of silage. Milk sales make up 93 percent of the 2011 total receipts for this dairy.

VTD140  A 140-cow, moderate-sized Vermont (Washington County) dairy. VTD140 plants 60 acres of hay and 160 acres of silage annually. Milk accounted for 91 percent of the 2011 receipts for this farm.

VTD400  A 400-cow, large-sized Vermont (Washington County) dairy. This farm plants 100 acres of hay and 850 acres of silage annually. Milk sales represent 93 percent of VTD400’s gross receipts in 2011.

MOGD180  A 180-cow, grazing dairy in southwest Missouri (Dade County), the farm grazes cows on 265 acres of improved pasture. Milk accounted for 91 percent of gross farm receipts for 2011.

MOGD550  A 550-cow, grazing dairy in southwest Missouri (Dade County), the farm grazes cows on 520 acres of improved pasture. Milk accounted for 91 percent of gross farm receipts for 2011.

FLND550  A 550-cow, moderate-sized north Florida (Lafayette County) dairy. The dairy grows 130 acres of hay each year. All other feed requirements are purchased in a pre-mixed ration. Milk sales accounted for 93 percent of the farm receipts.

FLSD1500  A 1,500-cow, large-sized south central Florida (Okeechobee County) dairy, FLSD1500 plants 100 acres of hay and 400 acres of silage annually. Milk sales represent 94 percent of 2011 total receipts.
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