Notes on a California Perspective of the Dairy Margin Protection Program (DMPP)

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If I were a California dairy producer I would want to know:

- How does the DMPP shape up for California? That is, how different are feed prices and milk prices here compared to the national prices used for the DMPP?
- Do our feed costs and milk prices in California correlate with feed costs and milk prices used for the 2014 farm Bill?
- How does DMPP compare to LGM-Dairy, and also to other risk management strategies such as futures and options for milk and feeds?
- Should I sign up for DMPP?

These brief notes are designed to help California dairy producers to gain a perspective on how California milk prices, average feed costs and margins (or IOFC) measure up to national milk prices and feed costs used to calculate the national DMPP margins.

Since the DMPP is a national program and there are no unique state perspectives, the following websites are recommended to ALL dairy producers to become familiar with the program.

http://www.fsa.usda.gov/mpptool

http://www.futurefordairy.com/program-details

http://www.dairymarkets.org/mpp/

http://farmdocdaily.illinois.edu/2014/05/2014-farm-bill-mpp-dairy-dashboard.html

http://www.agchoice.com/knowledge-center/field-notes-2?Article=401

The most important things to know about the DMPP:

- KNOW YOUR OWN MARGIN and what margin you require to survive. I cannot emphasize this enough. It is REALLY important to know what your margin is, otherwise you have no idea whether you need to sign up or not, and whether you need more protection.
- Sign up for the DMPP for 2014-2015 is September 2 – November 28, 2014. November 28 is the day after Thanksgiving, so to ensure sign up, you should probably do it just before Thanksgiving. But do not sign up too early! The FSA Margin Protection Program Decision Tool at http://www.fsa.usda.gov/mpptool is updated every day until 11/26/2014. You cannot change your decision choices for 2014/15 after November 28, 2014

- Be aware that if you do sign up for the DMPP, you are committed to stay with the DMPP for the lifetime of the 2014 Farm Bill (that is, until it expires in 2018). You cannot opt out of it. Since you are not able to use both DMPP and LGM-Dairy at the same time, signing up for DMPP this year means that you cannot use LGM-Dairy until after 2018.
- Therefore is essential that you give careful consideration to how DMPP stacks up against LGM-Dairy for your operation. You can check out how DMPP compares to LGM-Dairy right on the FSA Margin Protection Decision Tool indicated previously.
- Also remember that if you feel that your margins are threatened sometime in 2015, you can use the futures and/or options markets to design risk management strategies on a short term basis, and at any time during the Farm Bill period you want to.
- Become familiar with the FSA MPP decision tool at http://www.fsa.usda.gov/mpptool and remember it is updated every business day until November 26, 2014.
- Download and print out the instructions for use. They are very helpful (6 pages).
- Be aware that the FSA decision tool projections for margins are predicated on the futures markets for milk, corn, soybean meal and alfalfa. In general, futures markets are NOT very accurate at predicting LEVELS of prices and costs, but they are generally pretty accurate at predicting the DIRECTION of the markets, and more importantly the CHANGE in direction. Take some time to examine the historical coverages available on the FSA MPP decision tool. Remember, the projections for each year are calculated on September 28 of each year. So when you look at the historical coverages, click on the "Include Actual Margins" button to see how the futures market information stacked up against the actual margins. (This button does not operate for the current projections). Note that the projected margins (the black line encased in the green and red bands) does not do a good job of predicting the actual margins (the blue line), but it is pretty good at predicting the direction of the margins.
- You might also note that the historical data for 2008 (calculated on September 28, 2007) looks a lot like the 2015 (current) margin projection. In my opinion, you can probably bet on the fact that margins will fall over the next few months, but currently there is a less than 25% chance that they will fall below $8 by the end of 2015. In fact, you can see the probabilities calculated by pressing the Probability Table button.
- Producers will need to provide their actual production history when they sign up. The production history for most farms will be the highest level of milk sales in the 2011, 2012 or 2013 calendar years. That production history will not change over the life of the Farm Bill, and will not be able to be changed once you have signed up. However, your production history will be adjusted each year by the national average rate of growth in milk production. Put your production history level into the box in the upper right hand corner.
- After you have entered your Actual Production History (APH), you can then begin to calculate whether you need additional coverage. Press the "Select Coverage" button.
- Note that the Fees and Premiums quoted are based on YOUR actual production history in the upper right hand box and the Coverage Percentage of milk you chose.
- The "Expected Payments" are based on probabilities calculated at the time you view the tool.
- The "Expected Net Returns" is simply the Fees and Premiums in the left hand column LESS the expected payments in the center column.
- Take some time to play with the MPP tool to become familiar with ALL of its facets. It is a very useful tool, and will probably be all you need to do make a basic decision about DMPP.

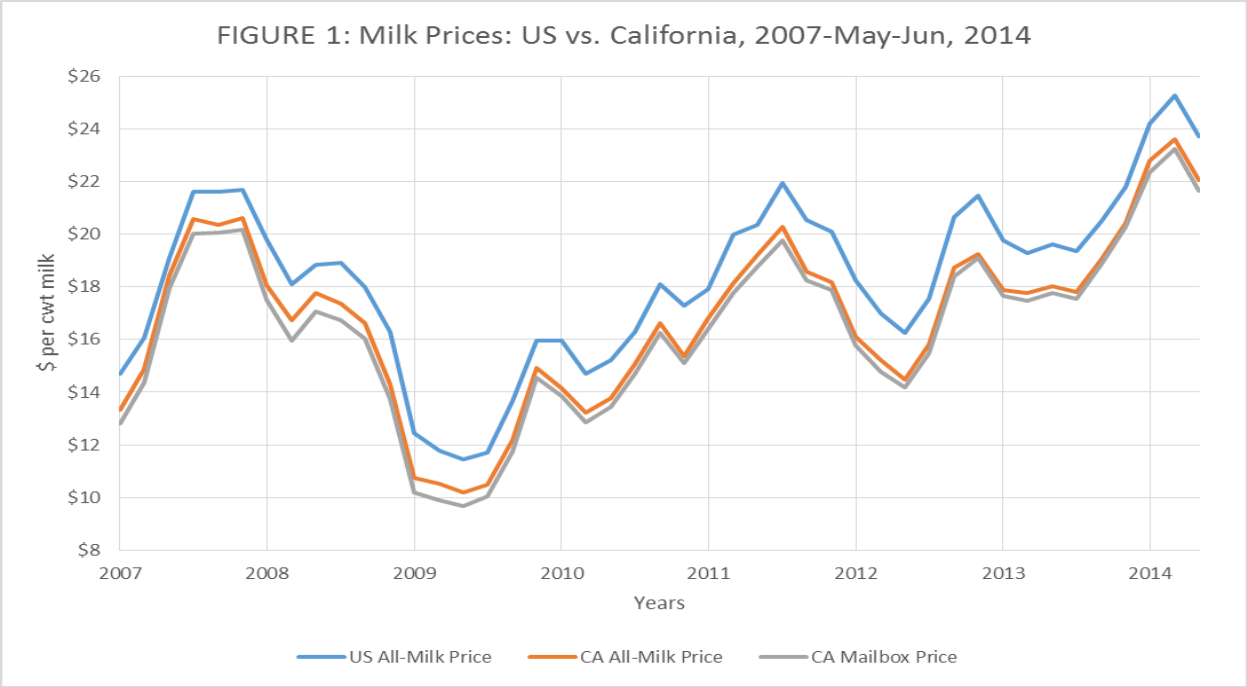
How does California fare with DMPP?

- The first and most important aspect of the DMPP with respect to California is that there is NO difference in DMPP for California dairy producers. There are no "adjustments" that a California dairy producer can make that make DMPP any better or worse compared to producers in other states.
- The most important thing about the DMPP is that all producers should know THEIR OWN income over feed costs (IOFC) or margin.
- The best way to get a feel for how the DMPP can affect you is to compare your own milk prices, feed costs and margins with national milk prices, feed costs and margins.
- The following is some statistical data that may help some California producers get a feel for what California milk prices, feed costs and margins look like compared to national averages used in the DMPP.

Milk Prices

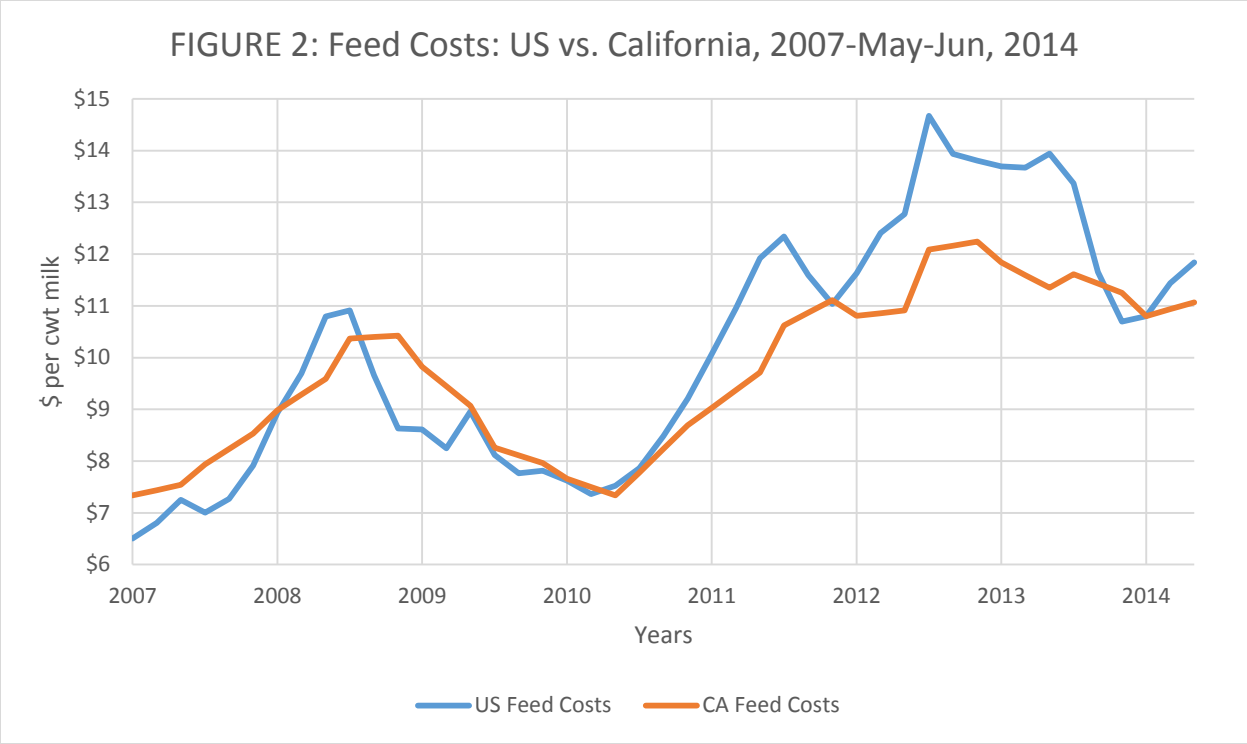
- In Figure 1, we compared the US All-Milk Price (which is used in the DMPP) to the California All-Milk price and the California Mailbox price from 2007 - present. Bear in mind that the DMPP operates on a two monthly basis, so all prices, costs and margins used in the DMPP are averages of each 2 months in the calendar year. i.e. Jan-Feb, Mar-Apr, May-Jun, etc. Therefore, there are only 6 bi-monthly average prices in each year. (Averages are simple averages, not weighted averages).
- The California Mailbox price is the price that CDFA uses to calculate the income over feed costs (IOFC) in the cost comparison data presented on their website. CDFA feels that the California mailbox price, which includes bonuses and does not include marketing costs is generally more reflective of the actual milk price that California dairy producers receive in their milk checks.
- However, since every producer in California receives a different price for their milk, depending on a number of factors including how much quota they have, it is recommended that they use their own actual historical prices when calculating their own margins.
- As is clear in Figure 1, California milk prices are generally lower than the US All milk price. On average the California Mailbox price since 2007 has been $1.92 less than the US All-Milk price. That $1.92 is of course not a constant, but merely an average. It is however, fairly consistent. The difference tends to be smaller for very low ($10/cwt) and very high ($23/cwt) prices. However, there is a very high correlation between California Mailbox prices and the US All-Milk prices. Since 2007 to the present, the correlation coefficient is 99.6%[1].

[1] For those who want to calculate the average California Mailbox Price from the US All-Milk price, use
CA Mailbox = 1/(-0.00880859 + (1.28415/US All Milk)) R^2 = 99.23%



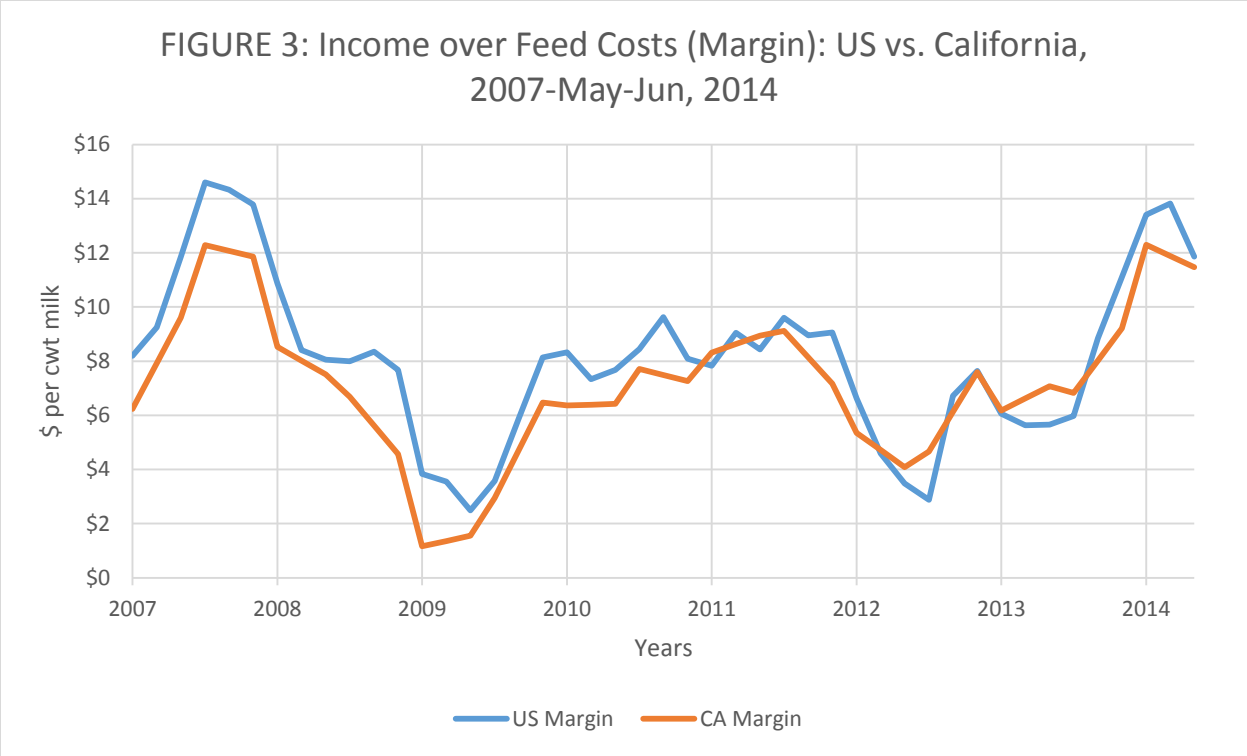
Feed Costs

- There are no good comparative data on the quantities of feed or the prices of feed that California producers use vis-à-vis the national average feed prices. In addition, it is not at all useful to use the feeds that are used to calculate the national average feed costs (corn, soybean meal and alfalfa) for obvious reasons. Therefore, the best estimates of average feed costs that we have for California can be obtained from the CDFA Dairy Survey data. In this case, I used the average feed costs and the income over feed costs (IOFC) found on the CDFA website http://www.cdfa.ca.gov/dairy/uploader/postings/copcostcomp/Default.aspx.
- In Figure 2, I compare the US Feed costs used to calculate the DMPP margin, with average California feed costs from the CDFA Dairy survey data. As is clear in Figure 2, California feed costs were higher (mostly) than US feed costs from 2007 through 2009, but since 2010, have been significantly lower than US feed costs, especially in the last two years (2012 and 2013). But it looks like they have come together again in 2014.
- On average, since 2007, California feed costs have been $0.44 per cwt lower than US feed costs. However in 2011-2013, they were significantly lower, indicating that California producers have adjusted to the rather tough conditions we experienced in 2009 and the higher costs of shipping feed from out-of-state. In general, statistical analysis reveals that when US feed costs are higher than $10 per cwt, average California feed costs tend to be from $0.60 - $1.60 per cwt lower than US feed costs. In fact, the average feed costs from 2011 through 2013 are $1.18 per cwt lower than US feed costs.
- Please remember, these are AVERAGE California feed costs. They may not be the same as your feed costs.

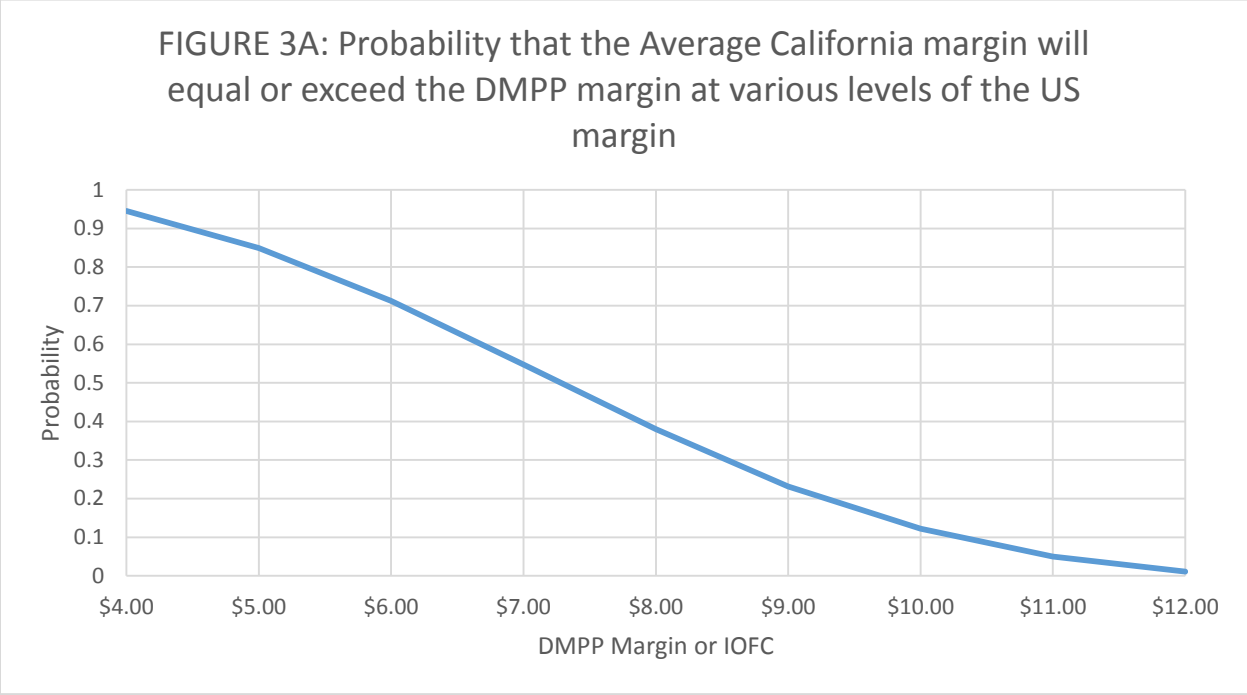


Income over Feed Costs (Margins)

- Figure 3 shows the results of income over feed costs (IOFC) or the "margin", as it is called, for the US and for California.
- As one might expect from the previous analysis, the California margin has been lower than the US margin for the years 2007 through 2010, but for 2011 – 2013 the difference has been minimal. On average, since 2007, the California margin has been $0.99 lower than the US margin. But due to the lower average feed costs, the margins have narrowed considerably. In fact, in 2012 and 2013, the average California margin was $0.10 higher than the US average.
- My statistical analysis (from 2007 to present) shows that the correlation between the DMPP margin and the average California margin since 2007 is about 95%. However, the average difference between them increases as margins get higher. If the US margin is at $4, the average California margin is also at about $4. If the US margin is at $8, the average California margin is about $0.88 lower. If the US margin is at $12, the average California margin is about $1.60 lower.
- Please bear in mind that these comparisons with the US margin are ONLY for average California margins. They may not be the same as your margin.



- I ran a simulation of the margin comparisons for 3,000 iterations. Assuming a normal distribution of U.S. margins since 2007, the probability that the California would equal or exceed the US margin is shown in Figure 3A.



- Figure 3A shows that as the DMPP margin increases, the probability that the California margin will equal or exceed it decreases. If the DMPP is at $8, there is only about a 40% probability that the California margin will equal or exceed it. However, if the DMPP is at $4, there is a 95% chance that the California margin will equal or exceed it.
- Although these probabilities apply only to average margins, it would appear that California dairy producers are probably adequately protected at or below the $4 minimum, and probably up to the $6 mark. However, if California dairy producers want more protection above the $4 minimum of the DMPP, they might be better off choosing LGM-Dairy for margin insurance or some other risk management tool such as futures and/or options.

Feed Costs vs. Milk Prices

- Figures 4 and 5 show a comparison of California Milk prices and feed costs (Figure 4) and US All Milk prices and feed costs (Figure 5).
- The point of showing these figures is to note that feed costs are much less volatile than milk prices. Therefore, although feed costs do contribute significant changes in the margin (Milk Price less Feed Cost), it is milk prices that have contributed significantly more volatility to the margin than feed costs.
- In addition, it is worth noting that since 2007, California feed costs, as reflected by the CDFA data, are less volatile than US feed costs. While this may be an anomaly of the data, California dairy producers should note that, on average, the major source of risk that they face is mainly due to milk price volatility. This is also backed up by statistical analysis. The variability of average California feed costs is lower than US feed costs. And the variability of California milk prices is slightly higher than US All milk prices, as measured by the coefficient of variation from 2007 – present.

FIGURE 4: California Milk Prices and Feed Costs, 2007-May-Jun, 2014

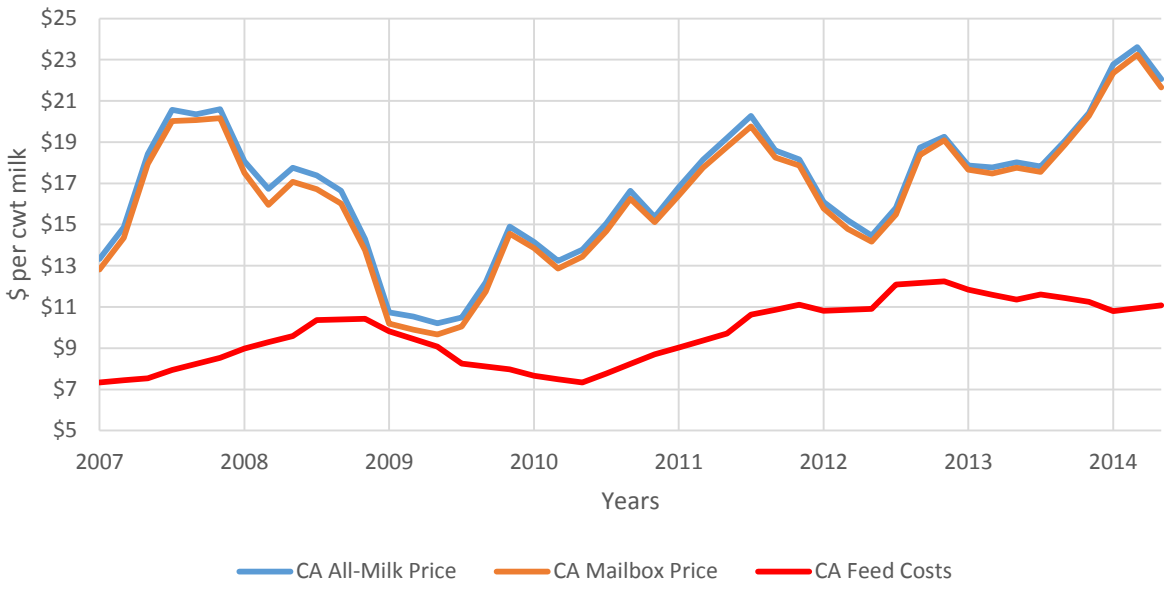
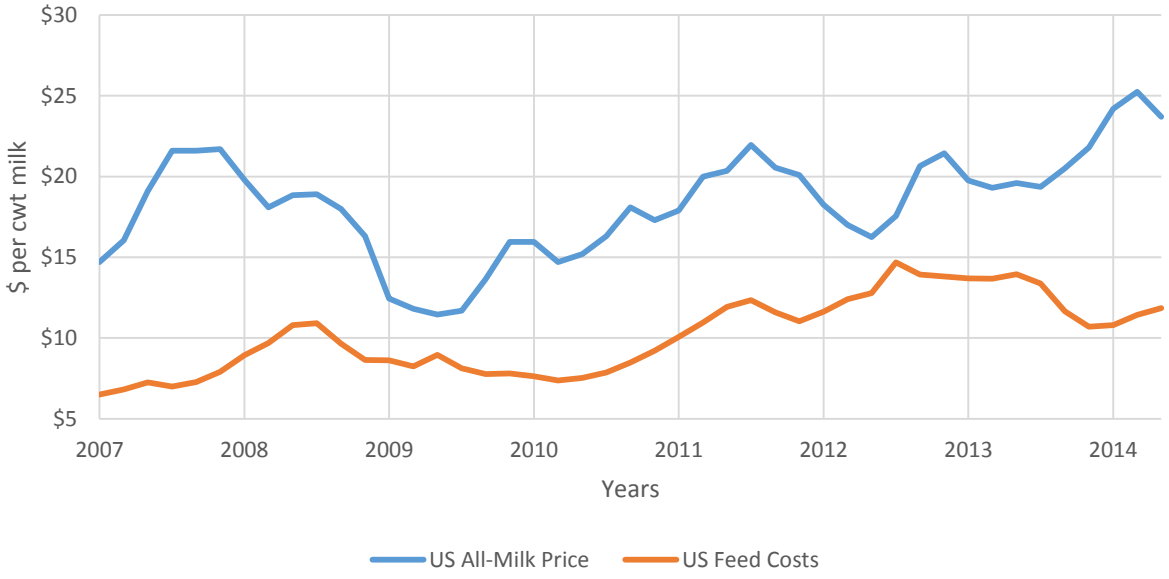


FIGURE 5: US Milk Prices and Feed Costs, 2007-May-Jun, 2014



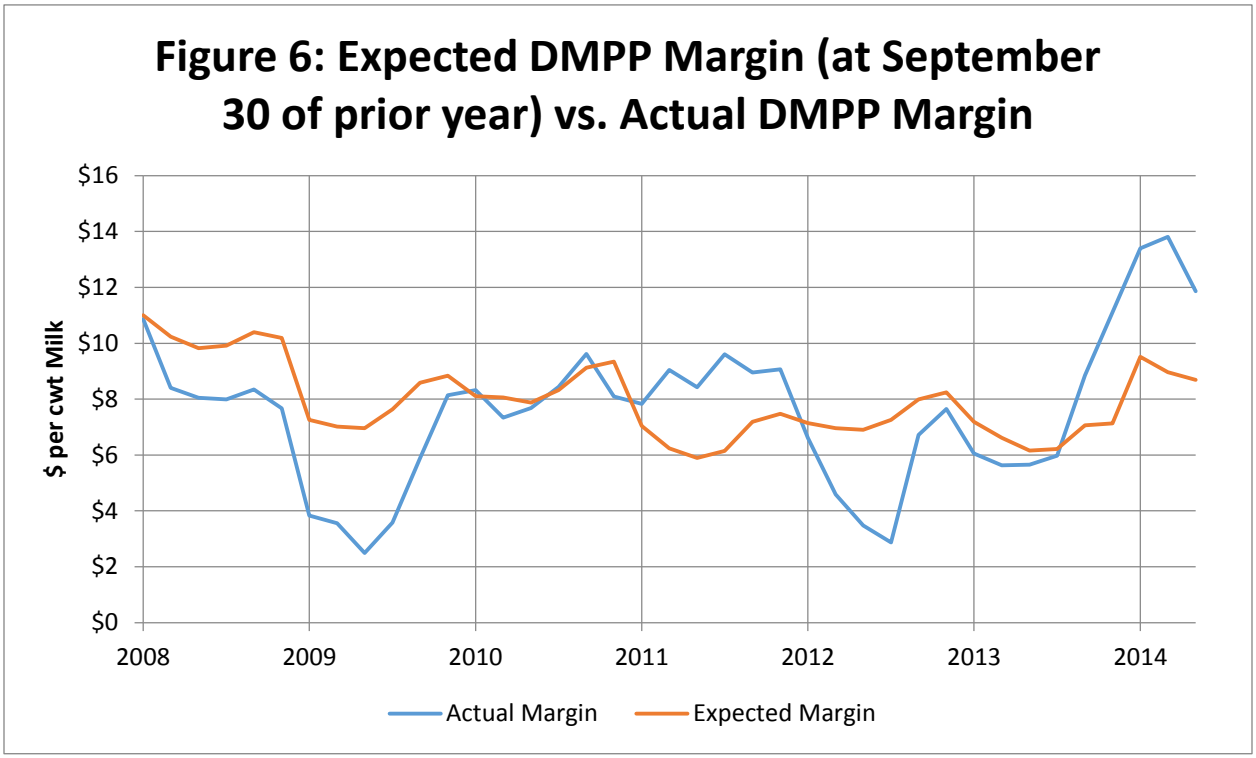
The Bottom Line

- DMPP is not a betting game! It is an insurance scheme that offers some protection for dairy producers against catastrophic levels of margins when feed costs are high and milk prices are low.
- There is no unique state strategy that can be invoked to account for differences in state milk prices and feed costs.
- Dairy producers should know their own margin. It is only by knowing your own margin, and what you need to survive, that you can hope to make rational decisions about the need for risk management strategies.
- The first comparison dairy producers should make is comparing DMPP with LGM-Dairy. You cannot be in both programs.
- The second comparison that producers need to make is between their own milk prices, feed cost and margins with the national milk prices, feed costs and margins.
- Producers should bear in mind that DMPP is not the only risk management tool that is available. If dairy producers feel at any time that their margins are threatened, they have the option of looking at futures and/or options to create floors and ceilings below which milk prices will not fall, or above which feed prices will not rise.
- At this time my own feeling is that producers who, after analyzing their own margins and are concerned about catastrophic prices and costs should seriously consider signing-up for the DMPP, paying the $100 fee and covering their margin for $4 for 90% of their milk. Despite the fact that you probably will not get any return on your $100, it is probably a worthwhile investment to make. If the DMPP margins do fall, the length of time for recovery is likely to be longer under the DMPP because others will have no incentive to decrease production if they are being supported by DMPP.
- But remember that if you do sign up, you are committed to DMPP for the length of the program through the end of 2018.
- For those who want to do further analysis, I have included the data used in these notes below.

Data Used for Analysis

Year	Bi-Month	US All Milk Price	CA All Milk Price	CA Mailbox Price	US Feed Cost	IOFC US	CA Feed Cost	IOFC CA
2007	Jan-Feb	14.70	13.34	12.82	6.50	8.20	7.34	6.23
2007	Mar-Apr	16.05	14.87	14.36	6.81	9.24	7.44	7.92
2007	May-Jun	19.10	18.43	17.95	7.25	11.85	7.54	9.60
2007	Jul-Aug	21.60	20.57	20.02	7.00	14.60	7.94	12.29
2007	Sep-Oct	21.60	20.35	20.07	7.27	14.33	8.24	12.07
2007	Nov-Dec	21.70	20.61	20.17	7.91	13.79	8.53	11.85
2008	Jan-Feb	19.80	18.07	17.51	8.94	10.86	8.98	8.52
2008	Mar-Apr	18.10	16.73	15.96	9.70	8.40	9.29	8.02
2008	May-Jun	18.85	17.76	17.07	10.80	8.05	9.59	7.51
2008	Jul-Aug	18.90	17.38	16.72	10.91	7.99	10.37	6.68
2008	Sep-Oct	18.00	16.64	16.02	9.66	8.34	10.40	5.62
2008	Nov-Dec	16.30	14.30	13.75	8.63	7.67	10.43	4.57
2009	Jan-Feb	12.45	10.74	10.19	8.61	3.84	9.82	1.16
2009	Mar-Apr	11.80	10.54	9.90	8.25	3.55	9.45	1.36
2009	May-Jun	11.45	10.21	9.67	8.96	2.49	9.07	1.55
2009	Jul-Aug	11.70	10.49	10.06	8.12	3.58	8.26	2.95
2009	Sep-Oct	13.65	12.20	11.75	7.77	5.88	8.11	4.71
2009	Nov-Dec	15.95	14.91	14.56	7.82	8.13	7.97	6.47
2010	Jan-Feb	15.95	14.16	13.86	7.62	8.33	7.66	6.36
2010	Mar-Apr	14.70	13.24	12.87	7.37	7.34	7.50	6.39
2010	May-Jun	15.20	13.79	13.45	7.52	7.68	7.34	6.42
2010	Jul-Aug	16.30	15.06	14.69	7.86	8.44	7.78	7.71
2010	Sep-Oct	18.10	16.64	16.25	8.48	9.62	8.24	7.49
2010	Nov-Dec	17.30	15.36	15.12	9.21	8.09	8.70	7.26
2011	Jan-Feb	17.90	16.81	16.41	10.07	7.83	9.03	8.31
2011	Mar-Apr	20.00	18.15	17.76	10.96	9.04	9.37	8.63
2011	May-Jun	20.35	19.20	18.76	11.92	8.43	9.71	8.94
2011	Jul-Aug	21.95	20.27	19.76	12.34	9.61	10.62	9.12
2011	Sep-Oct	20.55	18.59	18.25	11.59	8.96	10.87	8.14
2011	Nov-Dec	20.10	18.16	17.87	11.04	9.06	11.11	7.16
2012	Jan-Feb	18.25	16.10	15.79	11.63	6.62	10.81	5.35
2012	Mar-Apr	17.00	15.21	14.79	12.41	4.59	10.86	4.72
2012	May-Jun	16.25	14.47	14.18	12.77	3.48	10.91	4.09
2012	Jul-Aug	17.55	15.82	15.49	14.67	2.88	12.09	4.66
2012	Sep-Oct	20.65	18.73	18.38	13.94	6.71	12.16	6.13
2012	Nov-Dec	21.45	19.26	19.10	13.81	7.64	12.24	7.59
2013	Jan-Feb	19.75	17.87	17.66	13.69	6.06	11.84	6.17
2013	Mar-Apr	19.30	17.77	17.48	13.67	5.63	11.60	6.62
2013	May-Jun	19.60	18.02	17.75	13.94	5.66	11.35	7.07
2013	Jul-Aug	19.35	17.81	17.56	13.37	5.98	11.61	6.83
2013	Sep-Oct	20.50	19.06	18.87	11.65	8.85	11.43	8.02
2013	Nov-Dec	21.80	20.41	20.27	10.69	11.11	11.25	9.21
2014	Jan-Feb	24.20	22.78	22.36	10.80	13.40	10.80	12.30
2014	Mar-Apr	25.25	23.61	23.25	11.44	13.81	10.94	11.89
2014	May-Jun	23.70	22.06	21.66	11.84	11.86	11.07	11.47

So just how accurate are the projections based on the futures markets?



- Figure 6 shows a comparison of the actual DMPP margin and the expected margin as calculated at the end of September of the previous year. This is the expected margin shown in the FSA DMPP Decision Tool.
- The expected margin does NOT do a good job of predicting the actual margin, at least from a visual point of view. But it does do a reasonable job of "signaling" the direction and the changes in direction of the actual margin.
- Statistical analysis reveals that the direct correlation between the expected margin and the actual margin is very poor (about 42%). I tried regression analysis using the General Linear Model (GLM) technique to account for individual years, and this gave a much better result. However, since each individual year is a unique aspect of the predictability of the model, it is limited in its ability to predict further than the current year.
- It is tempting to try to extract probabilities of the ability of the expected margins to predict the actual margins. But the amount of serial correlation present and the uniqueness of each individual year limit the usefulness of such probabilities.
- BOTTOM LINE: There just is no good way of predicting how well the "expected" margins predict the actual margins, at least without further advanced analysis and more information.