1315 K STREET
MODESTO, CALIFORNIA 95354-0917
TELEPHONE (209) 527-6453
FAX (209) 527-0630

MEMORANDUM

To: Theresa A. Dunham; Somach, Simmons & Dunn

From: Annie AcMoody

Subject: Financial Impact to Retrofit Dairies that Do Not Have Tier 1 or Tier 2 Lagoons

Date: August 6, 2013

This memo estimates the financial impact to retrofit existing dairies that do not have Tier 1 or Tier 2 lagoons for a range of dairy sizes.

Scope/methodology

No two California dairies are exactly alike; dairy operators have different resources and production facilities. Therefore, this report provides a range of financial impacts. The estimated costs to retrofit dairy lagoons were based on an analysis provided by Provost and Pritchard (P&P). See memorandum from P&P dated August 5, 2013.

Specific farm financial information was compiled using California Department of Food and Agriculture (CDFA) data. The Cost of Production Unit, within the Dairy Marketing Branch of the CDFA, compiles cost of producing milk on a quarterly basis and publishes yearly averages for each of the production regions in California. More specifically for this analysis, a sample of dairies within California's Central Valley was used for each of the size categories analyzed by P&P.

Assumptions regarding the financing of the projects were made after interviewing personnel from three different lending institutions.

Due to market place volatility, it is extremely difficult to forecast dairy margins with any accuracy. One more reliable way is to look at past recent market conditions. The last five years presented an array of market conditions and provide insight on the financial situation faced by California dairy farmers. Assuming upcoming years are filled with similar extremely variable conditions, allows for an analysis of different scenarios.

Qualifications

Annie AcMoody graduated from Universite Laval, Quebec, Canada with a B.S in Agricultural Economics and Management. She also holds an M.S. in Agricultural Economics from Purdue University, West Lafayette, Indiana. Mrs. AcMoody has been the director of economic analysis for Western United Dairymen (WUD) since 2010. She has been an agricultural economist focusing on dairy economics issues in the state of California since 2007. More specifically, prior to working at WUD, she was an economist at the California Department of Food and Agriculture's Dairy Marketing Branch. In that role, she frequently analyzed the financial health of the California dairy industry, both from the dairy producers' and manufacturers' perspectives.

Dairy production in California

Milk and associated dairy products (cheese, dry milk powder, butter, ice cream, etc.) are California's top grossing agricultural products. Based on a study commissioned by the California Milk Advisory Board, California's dairy industry supported 450,000 jobs and generated $63 billion in economic impact statewide in 2008. Nationally, California's production is significant: in 2012, California led the nation in milk production, producing 21% of the U.S.'s milk supply.

In recent years, milk price volatility has become a part of dairy operators' reality. The large variation in estimated margins over the past five years is a clear illustration of that. 2009 was especially negative as dairy operators in California were faced with historically low prices for milk and unusually high cost of production. Costs of production have remained high, fueled notably by high feed costs that remain supported by the government's ethanol policies. The margins outlined in this document do not include the cost of compliance with environmental regulations, which are becoming an increasingly larger part of the cost of producing milk in California. Each year, dairies have been forced out of business. The net loss of dairy operations over the past five years totaled 387 farms. This data does not include the number of farmers forced out of business and whose dairies were acquired by another dairy operation that managed to stay in business.

California dairies are complex and advanced operations. Nearly all California dairies are family run, and the farmers strive for production efficiencies through the use of advanced technologies in genetics, nutrition, reproduction, animal housing, and animal welfare.

Data

1) Cost of production

   To calculate the impact of retrofitting dairy lagoons, data from the CDFA Cost of production studies were used. Those studies are conducted quarterly. CDFA staff goes to dairies and gather actual financial information. A sample representing approximately 10% of the dairy farms in California is analyzed each year to provide a representative picture of the financial health of the state's dairy operations (cost of production studies can be found at: http://cdfa.ca.gov/dairy/dairycop_annual.html). In this financial impact study, data from that sample was analyzed. More specifically, dairies representative of the sizes used in the P&P study were studied (300 cows, 750 cows, 1,500 cows and 3,000 cows).

   CDFA releases a cost of production that includes allowances (return on investment and return on management). Because the return on investment is an allowance that can be foregone if the dairy operation is in a dire situation, it was not included in the cost of production number for the purpose of this analysis.

   The cost of retrofitting dairy lagoons was analyzed under four different scenarios. Because the "new location" without assuming a wet clean-up cost was the cheaper option, it was used for a low end estimate. Utilization of both single and double liners was analyzed. The "new location" with wet clean-up cost is the most expensive option; therefore it was used as the most expensive end of the range for analysis purposes. Both single and double liners were also analyzed. From these four scenarios, specific yearly costs to the dairy were calculated using financing assumptions (repayment estimates included in Appendix A).

2) Revenue
Dairy operations' revenues come from the milk check they receive each month. In California, there is a milk pricing system that guarantees a minimum price processors are required to pay. However, each dairy ends up getting a different price due to different milk components, premiums, marketing costs, etc. Therefore, the mailbox price, which represents the net price received by a dairy, was used to determine the dairy revenue for each farm in the sample.

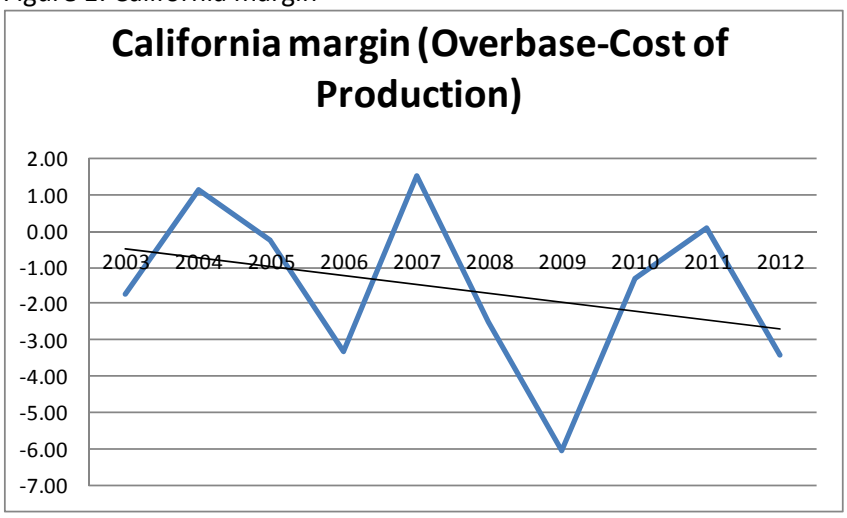
3) Financing
Because the cost of retrofitting dairy lagoons is significant, dairies would have to secure financing to pay for the project. The lack of available credit for dairy operations has been a popular topic in recent years and will be discussed in the Impact section further. For the sake of this study, it was assumed the dairy operation was able to secure a loan. But it is debatable whether a dairy would be able to secure a loan to proceed with the project because retrofitting a dairy lagoon does not create new value on the farm. Therefore, collateral, free of liens, would need to be available. Although some banks would rather lend on a shorter time frame, a twenty year loan seems to be a conservative option, lower yearly cost option and was used as an assumption. The current going interest rate for those terms is 6%.

Impact to dairies

1) Financial impact

Over the last decade, dairies have had to weather various pricing conditions, with some positive and some negative margin years. However, the overall trend is one of declining margins. A quick glance at the overbase price (minimum milk price paid producers) minus the cost of production (including allowances) illustrates that point (see Figure 1).

Figure 1: California margin



The bottom line experienced by dairies of the sizes outlined in the P&P memorandum did not exhibit a different trend during the past five years. 2008 and 2009 were not profitable years and forced dairies to dig into their equity to stay afloat (2008 for the 1,500 cow herd sample was an exception). 2010 and 2011 were profitable years while 2012 was not. Table 1 illustrates the net revenue per cow for each herd size.

Table 1: Net Revenue per Cow

Herd Size	2008	2009	2010	2011	2012
300	$ (89.74)	$ (891.12)	$ 52.11	$ 396.30	$ (321.12)
750	$ (33.26)	$ (745.69)	$ 175.36	$ 364.25	$ (309.39)
1500	$ 98.59	$ (840.59)	$ 195.37	$ 622.35	$ (117.88)
3000	$ (51.19)	$ (747.42)	$ 265.71	$ 746.33	$ (139.97)

Overall, for the past five years, dairy operations have fallen behind as the average net revenue per cow was negative for all herd sizes but one (see Table 2).

Table 2: Net revenue per cow, five year average

Average net revenue per cow				
Herd size	300	750	1500	3000
Past five year	$ (170.71)	$ (109.75)	$ (8.43)	$ 14.69

Looking at this data clearly explains the declining trend in the number of dairy operations in California. Left with no financial room to maneuver, adding on the cost of retrofitting dairy lagoons would prove impossible for most operations. The negative margins resulting are evidence of how much more economically fragile dairy operations would be if the costs of retrofitting lagoons were to be imposed on them. In no analyzed scenarios were dairies profitable with the added costs. Figure 2 illustrates that point. Table 3 after shows a more detailed analysis for each year and herd size.

Figure 2: Average net revenue per cow

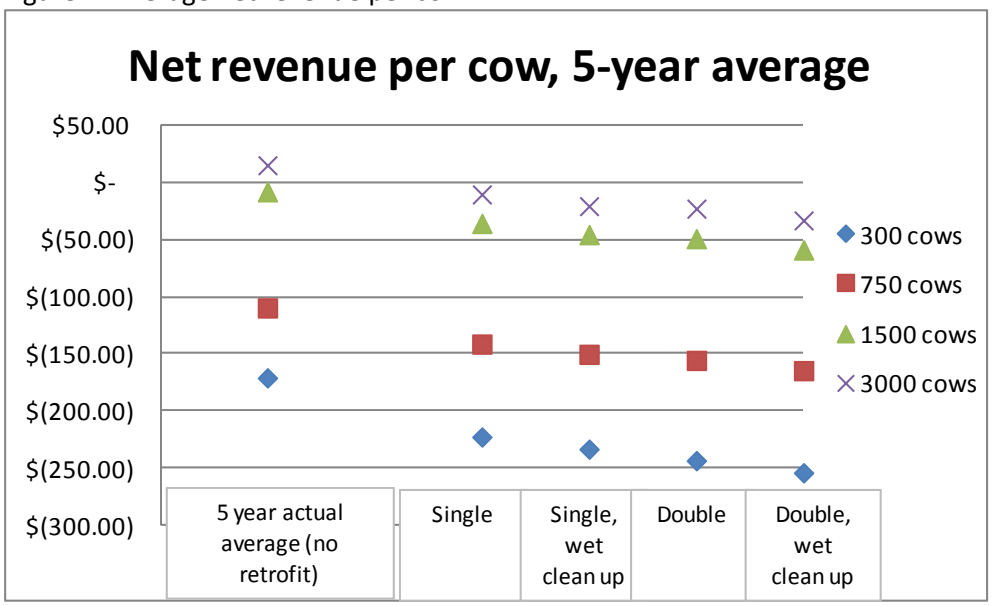


Table 3: Yearly margins by herd size based on four different costs scenarios

300	2008	2009	2010	2011	2012
Single liner	$ (141.32)	$ (942.70)	$ 0.52	$ 344.72	$ (372.71)
Single, wet clean up	$ (151.92)	$ (953.30)	$ (10.08)	$ 334.11	$ (383.31)
Double liner	$ (161.95)	$ (963.33)	$ (20.11)	$ 324.08	$ (393.34)
Double, wet clean up	$ (172.55)	$ (973.94)	$ (30.71)	$ 313.48	$ (403.94)
750	2008	2009	2010	2011	2012
Single liner	$ (64.79)	$ (777.21)	$ 143.83	$ 332.72	$ (340.91)
Single, wet clean up	$ (73.73)	$ (786.16)	$ 134.89	$ 323.78	$ (349.85)
Double liner	$ (79.00)	$ (791.43)	$ 129.62	$ 318.51	$ (355.13)
Double, wet clean up	$ (87.94)	$ (800.37)	$ 120.68	$ 309.57	$ (364.07)
1500	2008	2009	2010	2011	2012
Single liner	$ 70.96	$ (868.22)	$ 167.75	$ 594.72	$ (145.51)
Single, wet clean up	$ 61.16	$ (878.02)	$ 157.95	$ 584.92	$ (155.31)
Double liner	$ 57.67	$ (881.52)	$ 154.45	$ 581.42	$ (158.81)
Double, wet clean up	$ 47.87	$ (891.32)	$ 144.65	$ 571.62	$ (168.61)
3000	2008	2009	2010	2011	2012
Single liner	$ (76.60)	$ (772.84)	$ 240.29	$ 720.91	$ (165.39)
Single, wet clean up	$ (86.83)	$ (783.07)	$ 230.06	$ 710.68	$ (175.62)
Double liner	$ (89.04)	$ (785.27)	$ 227.86	$ 708.47	$ (177.82)
Double, wet clean up	$ (99.27)	$ (795.51)	$ 217.63	$ 698.24	$ (188.06)

2) Availability of credit

In conversations with lenders, the financing of the retrofitting projects would be difficult for most operations. To qualify for a real estate secured term loan covering the capital expenses amortized over 20 years, the loan would need to be secured by a 1st priority lien with a maximum debt against the appraised value of the real estate of 65%; this may cover 100% of the expenses or only a portion depending on the available lendable equity of the property. The borrower would need to have a debt-service coverage ratio (for all debt) of 1.25x.

If the dairy lagoon is retrofitted, the value of the dairy would most likely not change, i.e. the dairy's value would not increase because the retrofit was performed. Further, to obtain credit, the dairy likely needs to be free and clear of liens to have equity available. Due to the low profitability in the dairy industry over the past 5 years (as outlined in the previous section), facility values have been discounted heavily. One positive that the aforementioned analysis does not take into account is that farm-land values have appreciated greatly. However, this appreciation may not be sustainable and that appreciation is typically for a highest and best use of something other than growing forage crops to feed cows. It is generally tied to permanent plantings with most of the influence coming from nuts such as almonds, walnuts and pistachios.

Conclusion

A dairy lagoon retrofit would increase the overhead and breakeven cost to the operation. This increased cost of production, because it is not revenue generating, cannot be passed on to the processor or consumer so it reduces the profitability of the dairy. Ultimately, these costs could be the final add-on that may put a dairy operation out of business. Further, a large percentage of dairy operations would not be eligible for financing to complete a retrofit due to the lack of repayment capacity and because the operation is already likely over leveraged with existing debt.

Appendix A

TERMS OF LOAN

Life of loan (years)	20
Payments per year	12
Annual interest rate	6.00%

300 MC	New location, no clean up cost, Single liner	New location, wet clean up cost, Single liner	New location, no clean up cost, Double liner	New location, wet clean up cost Double liner
PRINCIPAL	$ 180,000.00	$ 217,000.00	$ 252,000.00	$ 289,000.00
Monthly Payment	$ 1,289.58	$ 1,554.66	$ 1,805.41	$ 2,070.49
750 MC				
PRINCIPAL	$ 275,000.00	$ 353,000.00	$ 399,000.00	$ 477,000.00
Monthly Payment	$ 1,970.19	$ 2,529.00	$ 2,858.56	$ 3,417.38
1500 MC				
PRINCIPAL	$ 482,000.00	$ 653,000.00	$ 714,000.00	$ 885,000.00
Monthly Payment	$ 3,453.20	$ 4,678.29	$ 5,115.32	$ 6,340.41
3000 MC				
PRINCIPAL	$ 887,000.00	$ 1,244,000.00	$ 1,321,000.00	$ 1,678,000.00
Monthly Payment	$ 6,354.74	$ 8,912.40	$ 9,464.05	$ 12,021.71