The Impact of the Dairy Margin Coverage (DMC) Program on the Risk Levels of Dairy Producers

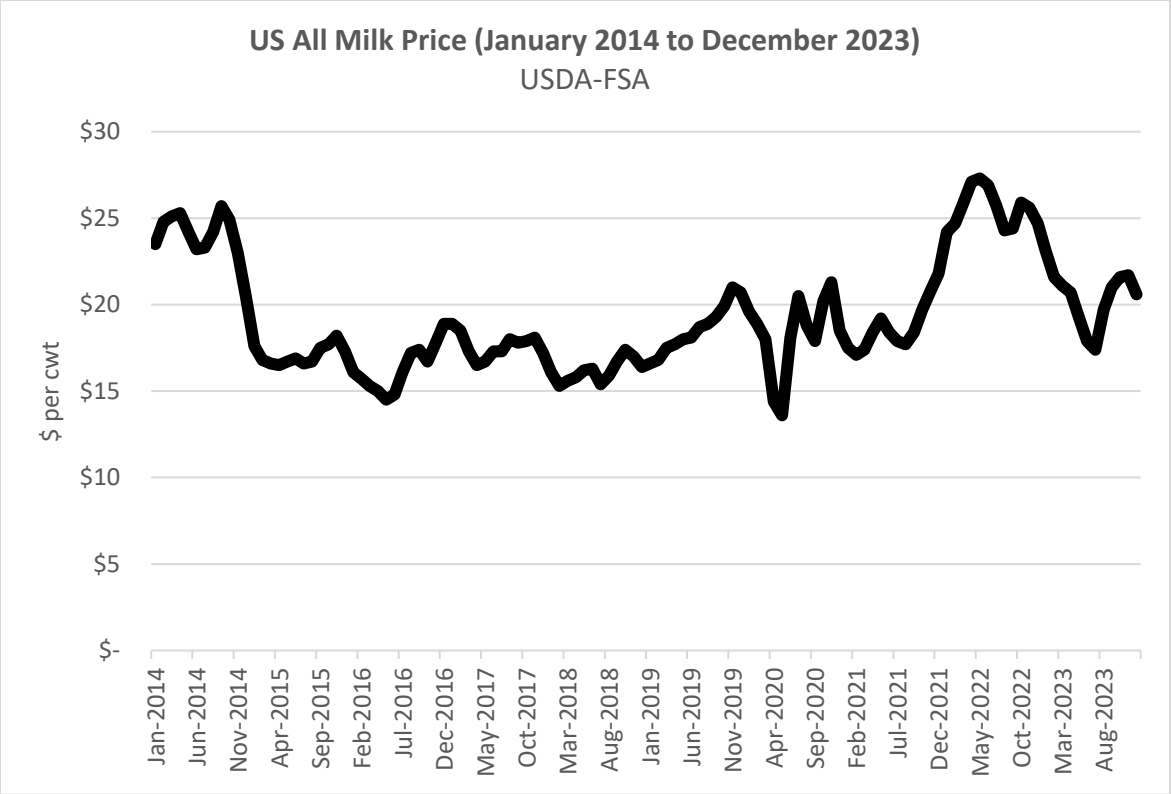
Kenneth H. Burdine, University of Kentucky Department of Agricultural Economics, kburdine@uky.edu
Tyler B. Mark, University of Kentucky Department of Agricultural Economics, tbmark0@uky.edu
Brian Williams, USDA Economic Research Service, Brian.Williams2@usda.gov
Erik Dohlman, USDA Economic Research Service, erik.dohlman@usda.gov

Selected Paper prepared for presentation at the 2024 Agricultural & Applied Economics Association Annual Meeting, New Orleans, LA; July 28-30, 2024

The Impact of the Dairy Margin Coverage (DMC) Program on the Risk Levels of Dairy Producers

Introduction and Background

The Dairy Margin Coverage (DMC) program was established by the 2018 Farm Bill and was really a significant revamp of the Margin Protection Program for dairy from the 2014 Farm Bill. DMC provides dairy producers an opportunity to guarantee a minimum estimated return over feed cost based on a set formula approximating milk revenue and production costs for a portion of their historical milk production. The program has been heavily utilized by dairy farmers and has resulted in significant payments since its inception. The DMC program is really the most recent tool made available to the dairy sector after several significant changes over the last couple of decades. Milk price has historically been very volatile (see figure 1) and numerous programs have existed historically to reduce the impact of this volatility on dairy farmers. Over time, these programs have included direct payments, subsidized insurance programs and ad hoc assistance, most notably during the COVID-19 pandemic (Wolfe, Novak, and Stephenson, 2021). The evolution of dairy programs over the last two decades largely laid the groundwork for the DMC program that is known today.



The Milk Income Loss Contract (MILC) program began in 2002 and provided direct payments to dairy farmers when fluid milk prices fell below a specified level (Bryant, Outlaw, and Anderson, 2007). The MILC program was truly counter cyclical in that it only provided payments when milk prices were systemically low. Changes were later made to the MILC program to increase the share of milk upon which payment could be received and add a feed cost element such that greater payment would be received when feed prices were higher (Federal Register, 2008,). The inclusion of the feed cost element was likely significant in the sense that it paved the way for more margin-oriented programs in the future.

While the MILC program was in existence, ag policy was generally evolving towards more market-based insurance tools. The Livestock Gross Margin program for dairy (LGM-Dairy) was initiated in 2009 and still exists today. Through the LGM-Dairy program, dairy farmers can purchase subsidized insurance that effectively allows them to capitalize on the expectations of prices of milk, corn, and soybean meal in the form of CME© futures prices. The resulting risk management position is similar to a bundled option, except the margin is insured (milk price minus feed cost), rather than the individual margin elements. The LGM-Dairy program had the additional benefit of allowing producers to scale milk and feed quantities for their operation, rather than being locked into CME© futures contract sizes. Research suggested considerable potential for risk reduction impacts from the program (Burdine et al., JAAE 2014).

Dairy Revenue Protection (DRP) was another insurance product that eventually became available to dairy producers. The DRP program allowed dairy farmers to purchase subsidized and scalable put options on milk they planned to market in the future (Wolfe, Novak, and Stephenson, 2021). It was similar to LGM-Dairy with the exception that it did not include any mechanism for managing feed cost risk. It is noteworthy that neither LGM-Dairy nor DRP provided countercyclical payments. If futures prices were such that milk prices and / or margins were unattractive, then these tools only allowed producers to cover themselves against prices / margins worsening.

With that background, the Margin Protection Program for Dairy (MPP-Dairy) was established in the 2014 Farm Bill and represented somewhat of a blend between a program like LGM-Dairy

and MILC. MPP-Dairy utilized the margin concept that was present in the LGM-Dairy program but moved away from the futures-based approach. Coverage levels (ie: margins) and the premium levels associated with MPP-Dairy were fixed for the life of the farm bill, making the program more counter cyclical like MILC. For this reason, MPP-Dairy was administered by the USDA Farm Service Agency, rather than being offered as a subsidized insurance product. Despite the fact that MPP-Dairy was not a very popular program, historical examinations of margins suggested potential for margin risk reduction from the program (Mark et al., 2016). However, expectations of milk and feed prices at the time the program was established were such that the potential for significant payouts was unlikely (Mark, Burdine, and Halich, 2014) and this largely proved to be the case.

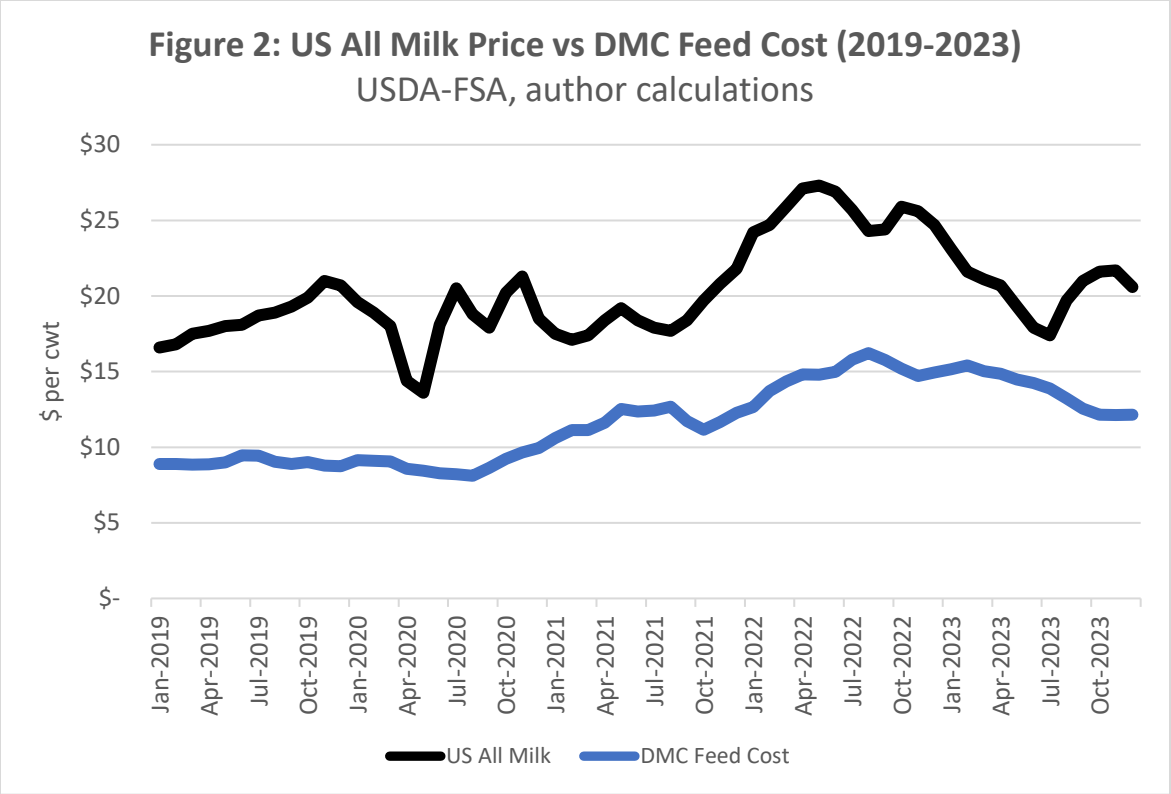
The current Dairy Margin Coverage program really evolved from the MPP-Dairy program and was established in the 2018 Farm Bill. Several changes were made to improve MPP-Dairy, most notably raising the maximum coverage level from $8 to $9.50 per cwt of milk, lowering premium levels paid by producers and increasing the amount of production history that could be covered at the lower premium levels (Yu and Gabrielyan, 2023). Put simply, it was made much more attractive to dairy farmers. Just like MPP-Dairy, DMC remains a bit of an old school program in the sense that the margins and premiums are fixed and do not evolve with the market. The following section will provide an overview of how the DMC program works.

An Overview of the DMC Program

The Dairy Margin Coverage program was designed to provide a layer of margin risk protection for dairy farmers. A set of formulas is utilized to estimate a monthly margin (return above feed cost) for a typical dairy farm on a per cwt basis. Dairy farmers can then enroll in the program to guarantee that margin at a specific level. For the purposes of the program, a dairy operation's production history is defined as their highest level of annual production from 2011 to 2013 and the operation can cover up to 95% of this production history. Price factors utilized in the calculation are national prices that are publicly available on a monthly basis. The DMC margin formula is as follows.

DMC Margin = (US all milk price) minus (corn price X 1.0728) minus (soybean meal price X 0.00735) minus (Alfalfa hay price X 0.0137).

An alternative way to think about the formula is that DMC margin calculation assumes that every cwt of milk produced requires 60.1 bushels of corn, 14.7 lbs of soybean meal, and 27.4 lbs of Alfalfa hay. Figure 2 tracks the US all milk price and the DMC feed cost from 2019-2023 using the prices and formula from above. The difference between the two lines is the DMC margin that producers can guarantee through DMC. Note the relatively low margins experienced in 2021 and 2023, and for a short period of time in 2020.



As mentioned previously, two of the primary changes made to MPP-Dairy when DMC was established were increasing the maximum level of coverage and lowering producer premiums (Yu and Gabrielyan, 2023). Premiums were divided into two tiers such that considerably lower premium rates were available on covered production up to 5 million lbs. And the highest three coverage levels were not available for production history beyond that level. Table 1 below shows premiums associated with each coverage level for both tiers. For clarity, a dairy farm with a large production history can still receive the lower rates associated with tier 1 on the first 5 million lbs they choose to cover. As a simple illustration of premium calculation for a producer that falls in tier 1, consider a producer that chose to cover 3 million lbs at the $9.50 coverage

level. That producer would pay a premium of $4,500 for the year (30,000 cwt times $0.15 per cwt in premium). Most farms will also pay a $100 per year administrative fee.

Table 1: Dairy Margin Coverage Premium by Lbs Covered Annually

Coverage Level	Premium per cwt (First 5 million lbs)	Premium per cwt (After 5 million lbs)
$4.00	None	None
$4.50	$0.0025	$0.0025
$5.00	$0.005	$0.005
$5.50	$0.03	$0.10
$6.00	$0.05	$0.31
$6.50	$0.07	$0.65
$7.00	$0.08	$1.107
$7.50	$0.09	$1.413
$8.00	$0.10	$1.813
$8.50	$0.105	Not offered
$9.00	$0.11	Not offered
$9.50	$0.15	Not offered

Once enrolled in the program, a participating farmer will receive a payment for each month that the actual DMC is below the coverage level they choose. The payment will be in the amount of the difference between their coverage level and the actual margin, times each cwt of milk they

had covered for that month (1/12 of the total covered for the year). Consider the scenario described above - a producer that enrolled in DMC and was covering 3 million lbs at the $9.50 coverage level. If the actual DMC margin was $8.50 for a given month, they would receive a payment for that month in the amount of $2,500 (2,500 cwt times $1 per cwt). This would be done for each of the 12 months in the year.

At tier 1 premium levels, indemnities from the DMC program exceeded premium levels over the 60 months from January 2019 to December 2023. This likely explains why participation in the program has been relatively high with 72% of CFAP participants enrolling in DMC and why $9.50 has been the most utilized margin level at tier 1 (Yu and Gabrielyan, 2023). Table 2 estimates the net gain to a producer covering 1 million to 5 million lbs of production over that time period. In all fairness, this 5-year period includes some very challenging time periods in the dairy business, namely 2021 and 2023, but the table does speak to the fact that the DCM program has significantly impacted producers that enrolled in tier 1 over the last 5 years.

Table 2: Historical Payments and Costs of DMC Participation (2019-2023)

Lbs Covered Annually	Premium + Admin Fee	Total Indemnity	Net Gain on DMC
1,000,000	$8,000.00	$69,360.33	$61,360.33
2,000,000	$15,500.00	$138,720.66	$123,220.66
3,000,000	$23,000.00	$208,081.00	$185,081.00
4,000,000	$30,500.00	$277,441.33	$246,941.33
5,000,000	$38,000.00	$346,801.66	$308,801.66

Note: Indemnities would be slightly lower due to sequestration, but that is not considered in the above calculations.

Materials, Methods, and Expected Results

While the program has clearly provided countercyclical aid to dairy producers, the focus of this paper was the examine the risk reduction impact of the DMC program. This was accomplished by collecting historical data available on the four elements of the DMC margin calculation – USDA All Milk, corn, soybean meal, and Alfalfa hay prices and using that to estimate distributions for these elements in the future. Through Monte Carlo Simulation (very similar to Mark, Burdine, and Halich (2014)), estimates were made of the impact of the DMC program on dairy producer margins and the percentage of reduction in margin risk participation in the program. It is expected that participation in the DMC program will positively impact milk margins for small dairies but have limited impact for medium and large dairies. Similarly, downside margin risk is expected to be significantly reduced by the DMC program for small dairies while having minimal impact on the risk levels of medium and large dairies.

References

Bryant, H., J. Outlaw, D. Anderson. 2007. "Aggregate Milk Supply Response to the Milk Income Loss Contract Program." Journal of Agribusiness 25(2)133-146.

Burdine, K., Y. Kusunose, L. Maynard, D. Blayney, and R. Mosheim. 2014. *Journal of Agricultural and Applied Economics* 46(2): 245-256.

Federal Register. 2008. “Milk Income Loss Contract Program and Price Support Program for Milk”. Commodity Credit Corporation.

Mark, T., K. Burdine, J. Cessna, and E. Dohlman. 2016. “The Effects of the Margin Protection Program for Dairy Producers.” Economic Research Service. Economic Research Report Number 214.

Mark, T., K. Burdine, and G. Halich. 2014. “How Sensitive are the Frequencies and Magnitudes of MPP-Dairy Indemnities.” *Journal of Agribusiness* 32(2).

Wolfe, A., W. Nowak, M. Stephenson. 2021. “COVID-19 and the U.S. Dairy Supply Chain.” *Choices* 36(3): 1-8.

Yu, J. and G. Gabrielyan. 2023. “Do large farms make better choices: Evidence from dairy margin coverage program participation patterns”. **Applied Economic Perspectives and Policy** 45: 2235-2254.