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Department of Agricultural and Consumer Economics, University of Illinois Urbana-Champaign

Livestock Gross Margin Insurance for Dairy: The Other Dairy Safety Net Solution

John Newton

Department of Agricultural and Consumer Economics
University of Illinois

Cameron Thraen

Department of Agricultural, Environmental and Development Economics
Ohio State University

Brian W. Gould

Department of Agricultural and Applied Economics
University of Wisconsin

Marin Bozic

Department of Applied Economics
University of Minnesota

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Overview

With all the attention on the new Margin Protection Program for Dairy Producers (MPP) let us not forget about Livestock Gross Margin Insurance for Dairy Cattle (LGM-Dairy). Similar to MPP, LGM-Dairy is *also* a USDA risk management instrument which offers protection against declines in average dairy income-over-feed-cost (IOFC) margins. Introduced in 2008, LGM-Dairy is an insurance product overseen by USDA's Risk Management Agency. Like crop insurance, LGM-Dairy is sold by private insurance agents and underwritten by the Federal Crop Insurance Corporation (for a complete description of LGM-Dairy rules see here).

As both LGM-Dairy and MPP are USDA programs, the 2014 Farm Bill allows dairy farmers to participate in either MPP or LGM-Dairy but they may not simultaneously use both programs. Given this one-or-the-other feature it is important to consider the benefits of each risk management instrument before making a participation decision. The features of MPP have been covered comprehensively here on *farmdoc daily* (see *farmdoc daily* February 12, 2014 and May 1, 2014). Today's post will complement previous posts on the dairy title and assist producers by reviewing the provisions and risk management opportunities under LGM-Dairy.[1]

What is Livestock Gross Margin Insurance for Dairy Cattle?

The primary feature of LGM-Dairy is that it is highly customizable. As a risk management instrument LGM-Dairy insures *average farmer-selected IOFC margins*, rather than a sequence of bi-monthly margins, and offers protection against a decline in average margins over a period of up to 10 months. Farmers can purchase a single month or some combination of months during the 10-month contract period. Multiple contracts can cover a particular month's milk production so long as no more than 100% of milk marketed is insured. The feed ration consisting of corn and soybean meal can be customized to accommodate dairies that buy feed, those that grow feed, or those who face little feed market risk and want to use LGM-Dairy to insure milk revenue.

Under LGM-Dairy, an indemnity at the end of the coverage period is the difference, if positive, between the total guaranteed gross margin less the deductible, and the total actual gross margins realized over the coverage period. The guaranteed gross margin is the difference between revenue from milk sales and purchased feed costs and is determined upon the purchase of the insurance contract based on Chicago Mercantile Exchange (CME) futures prices for class III milk, corn, and soybean meal. The actual gross margin is based on CME settlement prices measured over the last three days prior to the applicable futures contract expiration. By insuring an average gross margin over the life of the contract it is possible for low margins in covered months to be offset by higher margins in other covered months with the net result that there is no payout at the end of the contract.

LGM-Dairy is Actuarially Fair

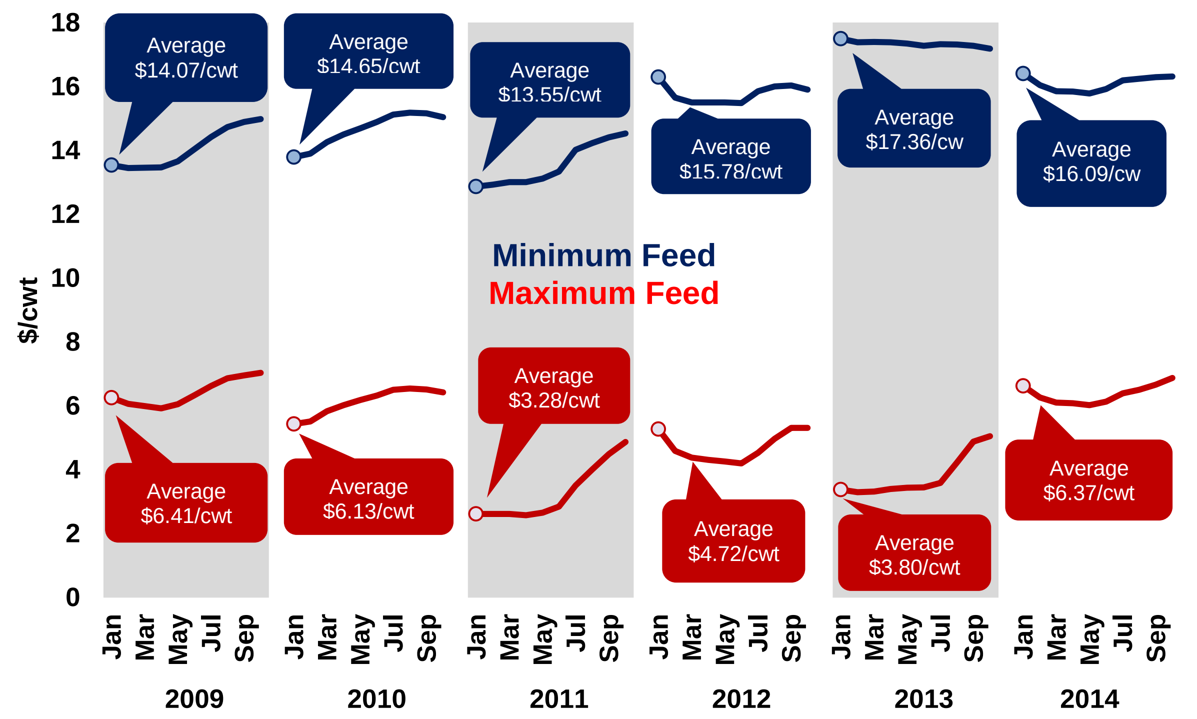
LGM-Dairy is an insurance product and as such is designed to reflect actuarially fair premiums. During every contract sales period the premiums for insurance coverage are *recalculated* based on farmer-selected parameters and price expectations in milk and feed markets. The premiums calculated during each sales period are contract specific and are equal to 1.03 times the expected indemnity less the declared deductible. For the details on the rating methodology or LGM-Dairy refer to here and here.

Premium subsidies from 18% to 50% are available and are determined based on the farmer-selected deductible level. Depending on underwriting capacity LGM-Dairy can be purchased once a month and is available on the last business Friday of each month on a first come, first served basis. Once the underwriting capacity has been reached sales of LGM-Dairy are suspended.

In order to illustrate how the risk management potential of LGM-Dairy is influenced by the rating methodology, a guaranteed gross margin using the maximum (red) and minimum (blue) allowable feed quantities per hundredweight (cwt) of milk was calculated. By using the maximum and minimum allowable feed rations a price range of available LGM-Dairy gross margins is formed. The guaranteed margins were calculated during the November sales period in order to establish a price floor for a 10-month LGM-Dairy insurance contract covering January through October of the following year. Adjustments were not made to account for milk and feed price basis.

[1] For more information on LGM-Dairy risk management opportunities see 1) Bozic, M., J. Newton, C.S. Thraen, and B.W. Gould. 2012. "Mean-reversion in Income Over Feed Cost Margins: Evidence and Implications for Managing Margin Risk by US Dairy Producers." *Journal of Dairy Science* 95:7417-7428. 2) Bozic, M., J. Newton, C.S. Thraen, and B.W. Gould. 2014. "Tails Curtailed: Accounting for Non-Linear Dependence in Pricing Margin Insurance for Dairy Farmers." *American Journal of Agricultural Economics* (Accepted March 2014) and 3) Valvekar, M., B. Gould, and V. Cabrera. 2010. "Identifying Cost-Minimizing Strategies for Guaranteeing Target Dairy Income Over Feed Cost via use of Livestock Gross Margin Dairy Insurance Program." *Journal of Dairy Science* 93:3350-3357.

Figure 1. Available Price Floors Using LGM-Dairy
November Prior Year Purchase Date (10-Month Contract)



As is apparent in Figure 1, LGM-Dairy covers a wide range of insurable margins and provides risk protection against unanticipated low margins. By design the insurable IOFC margin during each LGM-Dairy sales period is conditional on the price levels and market anticipated risk for milk and feed commodities. When the market forecast is for an increased likelihood of low margins, as was the case during November 2010, 2011, and 2012, it is not possible to lock-in high IOFC price floors if large quantities of feed are insured. As an example, during the November 2012 insurance sales period, a maximum feed insurance contract with a $0 deductible provided an average gross margin guarantee of $3.80 per cwt for January through October 2013. The inability to consistently lock in high IOFC margins with a maximum feed contract is a result of the rate making procedures underpinning LGM-Dairy. For this particular example, during the November 2012 sales period drought conditions across the U.S. increased uncertainty in corn and soybean meal futures contracts that resulted in January through October 2013 10-month average settlement prices of $7.30 per bushel of corn and $410 per ton of soybean meal.

The benefit of the actuarially fair nature of LGM-Dairy is that when projected margins are favorable there is an opportunity to lock in high margin levels. When current market IOFC margins levels are above average, margins sufficiently far into the future exhibit downside mean-reverting dynamics, i.e. distant months tend to move toward their average values. For example, during the most recent May 2014 insurance period, a maximum feed insurance contract with a $0 deductible provided an average gross margin guarantee of $7.84 per cwt for July through April 2015. Using the same parameters, a minimum feed contract provided an average 10-month gross margin guarantee of $18.32 per cwt. In this particular example the gross margin guarantee is influenced by present market information such as improved demand for U.S. dairy products overseas and lower feed input costs for corn.

What You See Is What You Get

Understanding these characteristics tells you that LGM-Dairy can only offer protection at levels which are consistent with market supply and demand fundamentals. The amount of coverage available under LGM-Dairy depends on the quantity of milk and feed protected, the farmer-selected deductible, premium subsidy, and market anticipated risk in the milk and feed prices. When anticipated margins or milk prices are low the LGM-Dairy guaranteed price floor will move down, and when expected margins or milk prices are high the LGM-Dairy guaranteed price floor will increase. In either case, the option-style nature of LGM-Dairy provides an opportunity to leave upside price potential open and lock in a price floor to limit downside risk.

This analysis represents a simplification of the use of the LGM-Dairy for risk management protection. It may be possible to generate higher gross margin guarantees by undertaking a series of shorter LGM-Dairy contracts or by changing other contract parameters such as the percentage of milk insured during a sales period. These changes in policy design allow additional market information to be integrated into the LGM-Dairy contract and will change the guaranteed price floor. However, additional specificity in LGM-Dairy contract design and the corresponding changes in the insurance premium and gross margin guarantee highlight the connection between LGM-Dairy and market supply and demand signals. MPP stands in contrast to these features of LGM-Dairy. Under MPP the insurance premium rates and IOFC coverage levels are fixed for the life of the Farm Bill and are disconnected from supply and demand fundamentals. These contract design features of MPP make it simple to use relative to other risk management instruments but increase the risk exposure to the underwriter, i.e. taxpayers.

The Farm Bill does not clarify if the decision to participate in LGM-Dairy or MPP is an annual decision or a one-time choice binding for the duration of the Farm Bill. If the decision is binding for the duration of the Farm Bill several issues are particularly worth emphasizing. First, consideration should be given to the availability of each program. MPP is designed to accommodate all U.S. producers, approximately 180 billion pounds of milk, while LGM-Dairy is limited by the underwriting capacity. Once the budget for insurance subsidies is depleted sales of LGM-Dairy is suspended. Therefore, when making a decision between MPP and LGM-Dairy you need to carefully access the likelihood of continuous LGM-Dairy availability compared to the guaranteed protection of MPP over the life of the Farm Bill. Second, if the enrollment decision is binding, the interplay between MPP and the U.S. milk supply could change the market fundamentals in such a way that insurable margins under LGM-Dairy may be reduced. With a high participation rate MPP could, at least in theory, increase the supply of milk and prolong the duration of low IOFC margins (see here). As illustrated in the previous section, if futures prices start to reflect expectations of extended sub-average margins, available margins using LGM-Dairy will also be sub-average.

Summary

The 2014 Farm Bill creates a new risk management instrument in the form of a Margin Protection Program for Dairy Producers. Dairy farmers may participate in the new MPP program or LGM-Dairy but not both. LGM-Dairy is available for purchase each month and is a fully customizable market based instrument offering protection only at prevailing market prices. MPP is available for purchase once per year and is a target-index safety net program offering single- or multi-year protection against declines in farm production margins. To help farmers better understand the merits of both programs today's post provided an overview of the risk management potential of LGM-Dairy and identified several key factors to consider between MPP and LGM-Dairy.

Before deciding to purchase LGM-Dairy or MPP as a risk management tool it is important to first review your dairy farm balance sheet to determine your farm-level risk exposure, how much margin variability your farm can withstand, and how much of an equity reduction you can sustain on your dairy (see here). Both programs provide the opportunity for dairy farmers to limit downside risk. When determining the advantages of one program over another it is important to consider additional factors in addition to basis, price floors, indemnities, and premium rates. Table 1 identifies several notable contract design differences among the two safety net programs. Consideration should be also be given to the program availability, coverage duration, frequency of indemnity payments, the level of customization, and potential interplay between MPP and LGM-Dairy coverage availability.

Table 1. Contract Design Features of MPP and LGM-Dairy

	MPP	LGM-Dairy
Coverage Level	Coverage is available each year from $4 to $8 per cwt in $0.50 increments on up to 90% of the maximum production over the 2011, 2012, and 2013 calendar years. The same percentage of milk covered is the same over all months of the contract.	Coverage is available at prevailing market prices. Insurable milk marketings are certified by the producer and subject to inspection from the insurance company. The percentage of milk covered can vary from month to month. Multiple contracts can be used to cover a month's production until 100% of a month's production is insured.
Sales Period	Farmer may change coverage options annually and coverage lasts one calendar year.	LGM-Dairy is available for purchase each month. Farmers may sign up 12 times per year. LGM-Dairy is offered on a first come, first serve basis and is subject to underwriting capacity.
Indemnity Payments	Payments made for consecutive two-month periods of Jan/Feb, Mar/Apr,…,Nov/Dec.	Payments made at the end of the coverage period.
Premium Rates	Fixed for the life of the Farm Bill (25% discount applied to 2014 and 2015 calendar year premium rates).	Designed to be actuarially fair. Sets the policy premium equal to 1.03 times the expected indemnity less the declared deductible.
Government Subsidy	No direct subsidy. There may exist significant indirect subsidies given the fixed premiums.	Premium subsidy up to 50% depending on a farmers declared deductible.
Farmer Customization	Fixed contract design with respect to feed ration and percent of milk covered. Dairy production margin formula is fixed. Feed quantities do not change.	LGM-Dairy can be tailored to farm size and feed usage (includes feed equivalent conversion) and to reflect actual feed market risk. Ration quantities are not fixed.
Agricultural Prices Used	Uses USDA announced prices for all-milk, corn, soybean meal, and alfalfa hay.	Uses simple average of futures prices for class III milk, corn, and soybean meal.

farmdoc has partnered with the National Program on Dairy Markets and Policy as well as the USDA to develop online decision aids and other materials to educate producers about MPP and LGM-Dairy (see here). One such decision aid already exists and that is the award-winning LGM-Dairy analyzer (see here). Once the final provisions of MPP are issued by USDA we will release the dairy decision tool in an effort to help producers across the U.S. may make informed risk management decisions regarding their dairy operation.

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