

# LGM-Dairy: Livestock Gross Margin for Dairy



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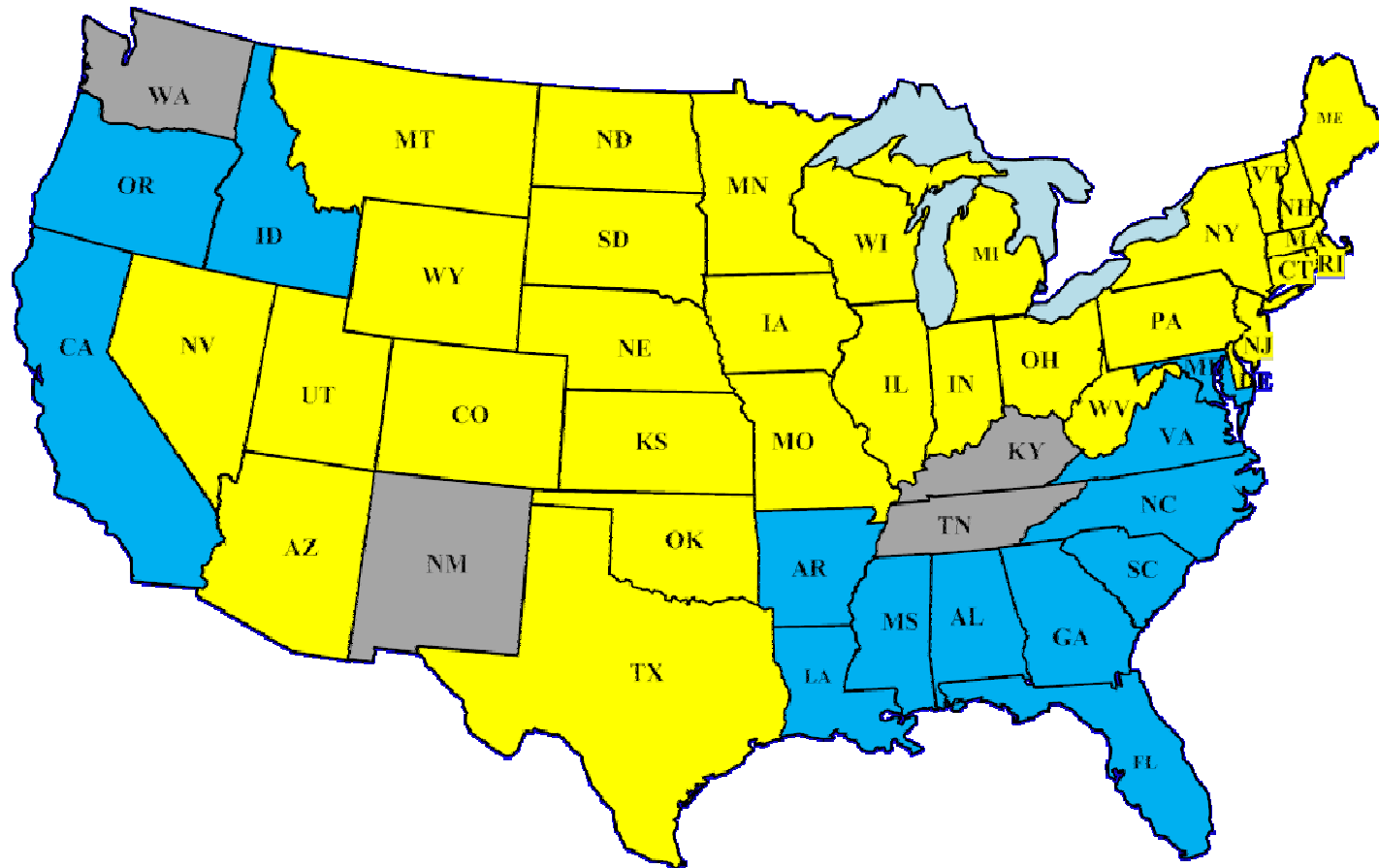
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Rochester, MN

## LGM-Dairy: What is it?

- New price risk management tool available to MN and WI dairy producers
  - Protects Dairy Business against Unexpected declines in Gross Margins
  - $\text{Gross Margin} = \text{Milk Revenue} - \text{Feed Costs}$
- Similar to a bundled option contract
  - Class III put option
  - Feeds call options
- Revenue neutral (No subsidies)
  - $\text{Premium} = \text{Expected Indemnity (long-run)}$

# LGM-Dairy: Who is eligible?

Milk producers of 32 states



LGM-Dairy eligible states shown in yellow, future states (July 2009) in gray

## LGM-Dairy: What it covers?

Prices of:

- Any proportion of producer's milk target marketing, restricted to:
  - Max 240,000 cwt during the 10-mo period
- Corn and soybean meal equivalents to be fed during insurance period, restricted to:
  - 0.13 – 1.04 bu corn/cwt milk
  - 1.61 – 12.85 lb SBM/cwt milk

# LGM-Dairy: What is the insurance period?

| Apr<br>2009                        | May<br>2009    | Jun<br>2009               | Jul<br>2009 | Aug<br>2009 | Sep<br>2009 | Oct<br>2009 | Nov<br>2009 | Dec<br>2009 | Jan<br>2010 | Feb<br>2010 | Mar<br>2010 |
|------------------------------------|----------------|---------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                                    |                | 1                         | 2           | 3           | 4           | 5           | 6           | 7           | 8           | 9           | 10          |
| <b>LGM-<br/>Dairy<br/>Contract</b> | No<br>Coverage | <b>Insurance Coverage</b> |             |             |             |             |             |             |             |             |             |
| <b>Coverage<br/>Selected</b>       |                | 100%                      | 0%          | 50%         | 50%         | 0%          | 0%          | 75%         | 100%        | 0%          | 50%         |

# LGM-Dairy: When is purchased?

Every month, but... March 2009

| Sunday                        | Monday | Tuesday              | Wednesday | Thursday | Friday | Saturday |
|-------------------------------|--------|----------------------|-----------|----------|--------|----------|
| 1                             | 2      | 3                    | 4         | 5        | 6      | 7        |
| 8-Daylight Saving Time Begins | 9      | 10                   | 11        | 12       | 13     | 14       |
| 15                            | 16     | 17-St. Patrick's Day | 18        | 19       | 20     | 21       |
| 22                            | 23     | 24                   | 25        | 26       | 27     | 28       |
| 29                            | 30     | 31                   |           |          |        |          |

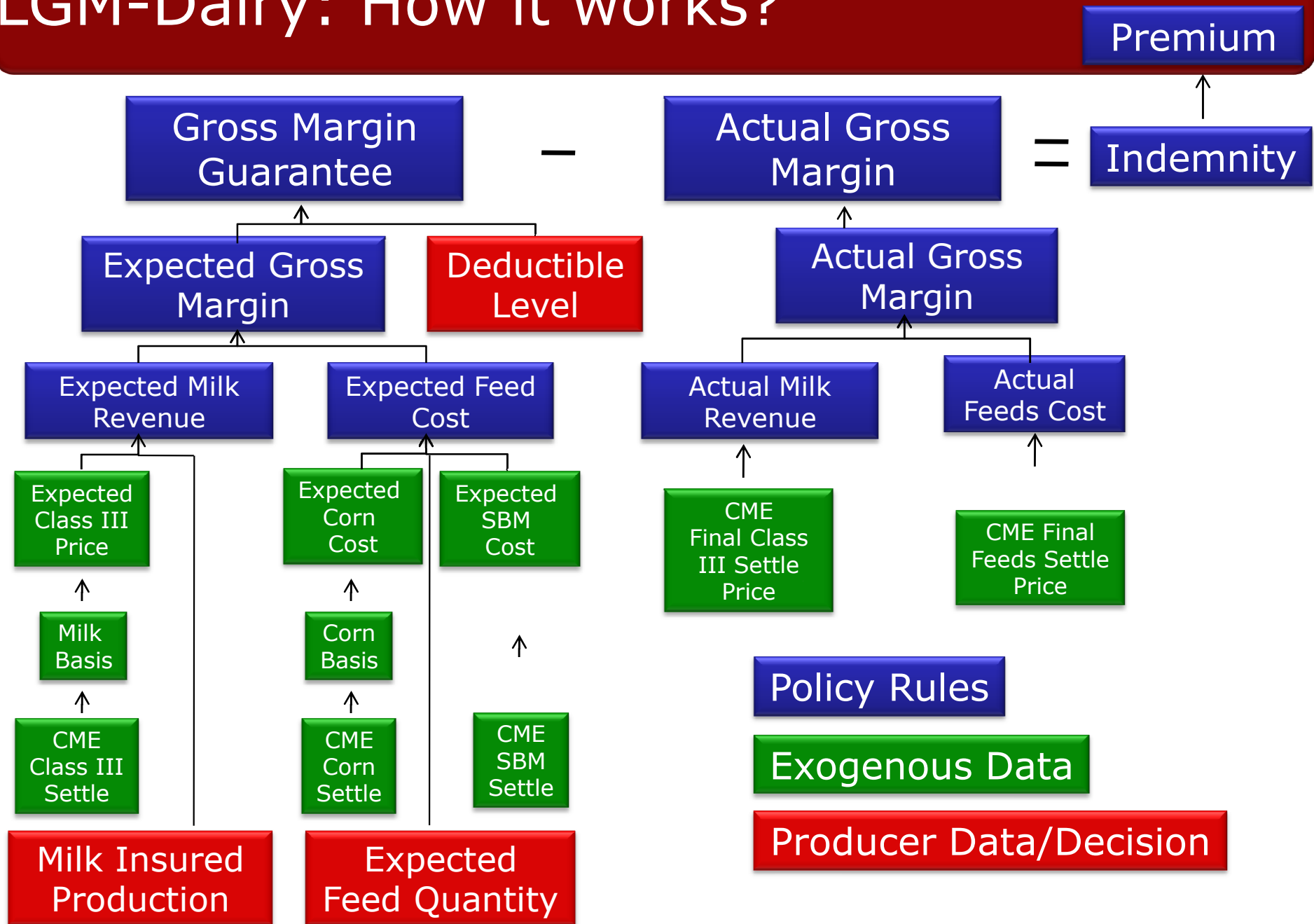
**Average Settle Prices Over These Days for Expected Prices**

**Purchase Day**

**Last Business Day**

**Have from 4 pm (EDT) on 27<sup>th</sup> until 9 am (EDT) on the 30<sup>th</sup> to make purchase decision**

# LGM-Dairy: How it works?



## LGM-Dairy: What are feed equivalents?

- All feed ingredients are converted to corn and soybean meal equivalents
- Conversion rates and tools are available at our web pages
- Flexible as long as they are inside the allowable ranges
- Example:
  - 1 ton of oats:
    - 0.78 tons corn equivalents, and
    - 0.12 tons soybean meal equivalents



## LGM-Dairy: How a deductible works?

- Deductible is the gross margin not insured
- Ranges from \$0 to \$1.5 in \$0.1 increments
- Impact on insurance
  - Higher deductible
    - Lower premium
    - Less coverage
    - Producer assumes more risk

## LGM-Dairy: How to calculate premiums?

- Use official RMA Premium Calculator
- Use University of Wisconsin Premium Calculator
- How it is done:
  - 5,000 random draws for Class III, corn, and soybean meal prices for the 10 months of a contract
  - Payouts =  $\max(\text{GMG-Simulated GM}, 0)$
  - Premium = Average Payouts + 3% reserve load

# LGM-Dairy: What impacts premiums?

- Producer controlled
  - Milk insured (+)
  - Feed insured (+)
  - Deductible (-)
  - Months insured
- Beyond producer control
  - Expected milk price (+)
  - Expected feed costs (-)
  - Expected price volatility (+)

# LGM-Dairy: How to calculate indemnities?

- Actual prices when futures expire
  - Average settle of 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> days prior to last trading day
  - Calculated for every month of the insurance contract
  - Every month Expected is compared with Actual
  - Indemnity is paid when
    - Total GMG < Actual GM
  - Indemnity paid after the last month insured

# LGM-Dairy: A Wisconsin Example (Mar 09)

## Contract

- Purchased Mar 29<sup>th</sup> 2009
- Coverage period: May 09 to Feb 10
- 250 cow farm (~20,000 lb RHA)
- Feed expected to be fed:
  - 41 lb corn/cwt milk (69% max allowable)
  - 10 lb of SBM/cwt milk (78% max allowable)
- Calculations performed with the University of Wisconsin LGM Premium Calculator

# LGM-Dairy: An Example (Mar 09)

## Wisconsin

| Insured Months | Expected Prod. (cwt) | Expected Corn Eq Fed (Tons) | Expected SBM Eq. Fed (Tons) | Expected All-Milk Price (\$/cwt) | Expected Corn Price (\$/bu) | Expected SBM Price (\$/Ton) | Gross Margin Guarantee @ \$1.5 Deductible |              |
|----------------|----------------------|-----------------------------|-----------------------------|----------------------------------|-----------------------------|-----------------------------|---|--------------|
|                |                      |                             |                             |                                  |                             |                             | Total \$                                  | \$/cwt       |
| May-09         | 4724                 | 95.8                        | 21.1                        | 13.68                            | 3.76                        | 289.63                      | 38,563                                    | 8.16         |
| Jun-09         | 4399                 | 101.1                       | 22.3                        | 14.51                            | 3.81                        | 287.23                      | 37,069                                    | 8.43         |
| Jul-09         | 4506                 | 97.6                        | 21.5                        | 15.57                            | 3.86                        | 284.83                      | 43,821                                    | 9.72         |
| Aug-09         | 4399                 | 98.8                        | 21.8                        | 16.60                            | 3.88                        | 277.70                      | 46,680                                    | 10.61        |
| Sep-09         | 4033                 | 97.6                        | 21.5                        | 17.33                            | 3.97                        | 268.03                      | 44,241                                    | 10.97        |
| Oct-09         | 4266                 | 93.7                        | 20.7                        | 18.06                            | 3.97                        | 258.57                      | 52,007                                    | 12.19        |
| Nov-09         | 3957                 | 94.9                        | 20.9                        | 18.15                            | 3.98                        | 257.49                      | 47,013                                    | 11.88        |
| Dec-09         | 4319                 | 94.1                        | 20.8                        | 18.06                            | 3.98                        | 256.40                      | 52,814                                    | 12.23        |
| Jan-10         | 4319                 | 94.7                        | 20.9                        | 18.01                            | 4.10                        | 257.63                      | 52,055                                    | 12.05        |
| Feb-10         | 3857                 | 96.7                        | 21.3                        | 17.71                            | 4.15                        | 259.25                      | 42,668                                    | 11.06        |
| <b>Total</b>   | <b>42,779</b>        | <b>965.0</b>                | <b>212.8</b>                | <b>-----</b>                     | <b>-----</b>                | <b>-----</b>                | <b>456,931</b>                            | <b>10.68</b> |

# LGM-Dairy: An Example (Mar 09)

## Minnesota

| Insured Months | Expected Prod. (cwt) | Expected Corn Eq Fed (Tons) | Expected SBM Eq. Fed (Tons) | Expected All-Milk Price (\$/cwt) | Expected Corn Price (\$/bu) | Expected SBM Price (\$/Ton) | Gross Margin Guarantee @ \$1.5 Deductible |              |
|----------------|----------------------|-----------------------------|-----------------------------|----------------------------------|-----------------------------|-----------------------------|---|--------------|
|                |                      |                             |                             |                                  |                             |                             | Total \$                                  | \$/cwt       |
| May-09         | 4724                 | 95.8                        | 21.1                        | 13.48                            | 3.63                        | 289.63                      | 38,063                                    | 8.06         |
| Jun-09         | 4399                 | 101.1                       | 22.3                        | 14.33                            | 3.69                        | 287.23                      | 36,710                                    | 8.35         |
| Jul-09         | 4506                 | 97.6                        | 21.5                        | 15.41                            | 3.73                        | 284.83                      | 43,553                                    | 9.67         |
| Aug-09         | 4399                 | 98.8                        | 21.8                        | 16.54                            | 3.76                        | 277.70                      | 46,840                                    | 10.65        |
| Sep-09         | 4033                 | 97.6                        | 21.5                        | 17.27                            | 3.82                        | 268.03                      | 44,522                                    | 11.04        |
| Oct-09         | 4266                 | 93.7                        | 20.7                        | 17.88                            | 3.84                        | 258.57                      | 51,674                                    | 12.11        |
| Nov-09         | 3957                 | 94.9                        | 20.9                        | 17.97                            | 3.86                        | 257.49                      | 46,708                                    | 11.80        |
| Dec-09         | 4319                 | 94.1                        | 20.8                        | 17.86                            | 3.89                        | 256.40                      | 52,253                                    | 12.10        |
| Jan-10         | 4319                 | 94.7                        | 20.9                        | 17.73                            | 4.01                        | 257.63                      | 51,151                                    | 11.84        |
| Feb-10         | 3857                 | 96.7                        | 21.3                        | 17.43                            | 4.00                        | 259.25                      | 42,106                                    | 10.92        |
| <b>Total</b>   | <b>42,779</b>        | <b>965.0</b>                | <b>212.8</b>                | <b>-----</b>                     | <b>-----</b>                | <b>-----</b>                | <b>453,579</b>                            | <b>10.60</b> |

# LGM-Dairy: An Example (Mar 09)

| Insured Months | Coverage (%) |
|----------------|--------------|
| May-09         | 100%         |
| Jun-09         | 100%         |
| Jul-09         | 100%         |
| Aug-09         | 100%         |
| Sep-09         | 100%         |
| Oct-09         | 100%         |
| Nov-09         | 100%         |
| Dec-09         | 100%         |
| Jan-10         | 100%         |
| Feb-10         | 100%         |

| Deductible Level (\$/cwt) | Total Premium (\$) | Prem/cwt (\$/cwt) | Gross Margin Guarantee (\$) | Premium as % of GMG | Guarantee/cwt (\$/cwt) | % Prem/cwt Change | %GMG Change | Probability of Payout (%) |
|---------------------------|--------------------|-------------------|-----------------------------|---------------------|------------------------|-------------------|-------------|---------------------------|
| 0.0                       | 41,182             | 0.963             | 521,100                     | 7.90                | 12.18                  | -----             | -----       | 51.7                      |
| 0.1                       | 38,942             | 0.910             | 516,822                     | 7.53                | 12.08                  | -5.44             | -0.82       | 49.8                      |
| 0.2                       | 36,789             | 0.860             | 512,544                     | 7.18                | 11.98                  | -10.67            | -1.64       | 48.0                      |
| 0.3                       | 34,714             | 0.811             | 508,266                     | 6.83                | 11.88                  | -15.71            | -2.46       | 46.3                      |
| 0.4                       | 32,702             | 0.764             | 503,988                     | 6.49                | 11.78                  | -20.59            | -3.28       | 44.9                      |
| 0.5                       | 30,770             | 0.719             | 499,710                     | 6.16                | 11.68                  | -25.28            | -4.10       | 42.8                      |
| 0.6                       | 28,924             | 0.676             | 495,432                     | 5.84                | 11.58                  | -29.76            | -4.93       | 41.1                      |
| 0.7                       | 27,158             | 0.635             | 491,154                     | 5.53                | 11.48                  | -34.05            | -5.75       | 39.3                      |
| 0.8                       | 25,478             | 0.596             | 486,876                     | 5.23                | 11.38                  | -38.13            | -6.57       | 37.0                      |
| 0.9                       | 23,880             | 0.558             | 482,599                     | 4.95                | 11.28                  | -42.01            | -7.39       | 35.4                      |
| 1.0                       | 22,356             | 0.523             | 478,321                     | 4.67                | 11.18                  | -45.71            | -8.21       | 33.8                      |
| 1.1                       | 20,897             | 0.488             | 474,043                     | 4.41                | 11.08                  | -49.26            | -9.03       | 32.4                      |
| 1.2                       | 19,498             | 0.456             | 469,765                     | 4.15                | 10.98                  | -52.65            | -9.85       | 31.1                      |
| 1.3                       | 18,168             | 0.425             | 465,487                     | 3.90                | 10.88                  | -55.88            | -10.67      | 29.4                      |
| 1.4                       | 16,907             | 0.395             | 461,209                     | 3.67                | 10.78                  | -58.95            | -11.49      | 27.9                      |
| 1.5                       | 15,709             | 0.367             | 456,931                     | 3.44                | 10.68                  | -61.85            | -12.31      | 26.5                      |



# LGM-Dairy: An Example (Mar 09)

| Insured Months | Coverage (%) | Deductible Level (\$/cwt) | Total Premium (\$) | Prem/cwt (\$/cwt) | Gross Margin Guarantee (\$) | Premium as % of GMG | Guarantee/cwt (\$/cwt) | % Prem/cwt Change | %GMG Change | Probability of Payout (%) |
|----------------|--------------|---------------------------|--------------------|-------------------|-----------------------------|---------------------|------------------------|-------------------|-------------|---------------------------|
|                |              | 0.0                       | 8,735              | 0.792             | 121,733                     | 7.18                | 11.04                  | -----             | -----       | 52.2                      |
|                |              | 0.1                       | 8,152              | 0.739             | 120,630                     | 6.76                | 10.94                  | -6.68             | -0.91       | 50.3                      |
|                |              | 0.2                       | 7,593              | 0.688             | 119,527                     | 6.35                | 10.84                  | -13.08            | -1.81       | 47.9                      |
| May-09         | 50%          | 0.3                       | 7,062              | 0.640             | 118,424                     | 5.96                | 10.74                  | -19.16            | -2.72       | 45.6                      |
| Jun-09         | 50%          | 0.4                       | 6,556              | 0.594             | 117,320                     | 5.59                | 10.64                  | -24.95            | -3.62       | 43.3                      |
| Jul-09         | 50%          | 0.5                       | 6,077              | 0.551             | 116,217                     | 5.23                | 10.54                  | -30.43            | -4.53       | 41.0                      |
| Aug-09         | 50%          | 0.6                       | 5,623              | 0.510             | 115,114                     | 4.88                | 10.44                  | -35.63            | -5.44       | 38.9                      |
| Sep-09         | 50%          | 0.7                       | 5,194              | 0.471             | 114,011                     | 4.56                | 10.34                  | -40.54            | -6.34       | 36.6                      |
| Oct-09         | 0%           | 0.8                       | 4,788              | 0.434             | 112,908                     | 4.24                | 10.24                  | -45.19            | -7.25       | 34.7                      |
| Nov-09         | 0%           | 0.9                       | 4,403              | 0.399             | 111,805                     | 3.94                | 10.14                  | -49.59            | -8.16       | 32.9                      |
| Dec-09         | 0%           | 1.0                       | 4,041              | 0.366             | 110,702                     | 3.65                | 10.04                  | -53.74            | -9.06       | 30.9                      |
| Jan-10         | 0%           | 1.1                       | 3,701              | 0.335             | 109,599                     | 3.38                | 9.94                   | -57.63            | -9.97       | 29.0                      |
| Feb-10         | 0%           | 1.2                       | 3,381              | 0.307             | 108,496                     | 3.12                | 9.84                   | -61.29            | -10.87      | 27.1                      |
|                |              | 1.3                       | 3,081              | 0.279             | 107,393                     | 2.87                | 9.74                   | -64.72            | -11.78      | 25.4                      |
|                |              | 1.4                       | 2,802              | 0.254             | 106,290                     | 2.64                | 9.64                   | -67.92            | -12.69      | 23.8                      |
|                |              | 1.5                       | 2,542              | 0.230             | 105,187                     | 2.42                | 9.54                   | -70.90            | -13.59      | 22.1                      |

# LGM-Dairy: An Example (Mar 09)

| Insured Months | Coverage (%) |
|----------------|--------------|
| May-09         | 0%           |
| Jun-09         | 0%           |
| Jul-09         | 0%           |
| Aug-09         | 0%           |
| Sep-09         | 0%           |
| Oct-09         | 50%          |
| Nov-09         | 50%          |
| Dec-09         | 50%          |
| Jan-10         | 50%          |
| Feb-10         | 50%          |

| Deductible Level (\$/cwt) | Total Premium (\$) | Prem/cwt (\$/cwt) | Gross Margin Guarantee (\$) | Premium as % of GMG | Guarantee/cwt (\$/cwt) | % Prem/cwt Change | %GMG Change | Probability of Payout (%) |
|---------------------------|--------------------|-------------------|-----------------------------|---------------------|------------------------|-------------------|-------------|---------------------------|
| 0.0                       | 13,853             | 1.337             | 138,817                     | 9.98                | 13.40                  | -----             | -----       | 52.2                      |
| 0.1                       | 13,302             | 1.284             | 137,781                     | 9.65                | 13.30                  | -3.98             | -0.75       | 51.0                      |
| 0.2                       | 12,763             | 1.232             | 136,745                     | 9.33                | 13.20                  | -7.87             | -1.49       | 49.9                      |
| 0.3                       | 12,238             | 1.181             | 135,709                     | 9.02                | 13.10                  | -11.66            | -2.24       | 48.6                      |
| 0.4                       | 11,725             | 1.132             | 134,674                     | 8.71                | 13.00                  | -15.37            | -2.98       | 47.4                      |
| 0.5                       | 11,227             | 1.084             | 133,638                     | 8.40                | 12.90                  | -18.96            | -3.73       | 45.9                      |
| 0.6                       | 10,743             | 1.037             | 132,602                     | 8.10                | 12.80                  | -22.45            | -4.48       | 44.8                      |
| 0.7                       | 10,273             | 0.992             | 131,566                     | 7.81                | 12.70                  | -25.84            | -5.22       | 43.4                      |
| 0.8                       | 9,817              | 0.948             | 130,530                     | 7.52                | 12.60                  | -29.13            | -5.97       | 42.1                      |
| 0.9                       | 9,374              | 0.905             | 129,494                     | 7.24                | 12.50                  | -32.33            | -6.72       | 40.9                      |
| 1.0                       | 8,945              | 0.864             | 128,458                     | 6.96                | 12.40                  | -35.43            | -7.46       | 39.5                      |
| 1.1                       | 8,531              | 0.824             | 127,422                     | 6.70                | 12.30                  | -38.42            | -8.21       | 38.2                      |
| 1.2                       | 8,128              | 0.785             | 126,386                     | 6.43                | 12.20                  | -41.33            | -8.95       | 37.3                      |
| 1.3                       | 7,737              | 0.747             | 125,350                     | 6.17                | 12.10                  | -44.15            | -9.70       | 36.0                      |
| 1.4                       | 7,362              | 0.711             | 124,315                     | 5.92                | 12.00                  | -46.86            | -10.45      | 34.3                      |
| 1.5                       | 7,003              | 0.676             | 123,279                     | 5.68                | 11.90                  | -49.45            | -11.19      | 33.1                      |

## LGM-Dairy: Summary

### Advantages:

- Unique bundled insurance protects the margin: milk price less feed cost
- Very flexible and customizable
- Offered every month of the year

### Drawbacks:

- Short enrollment period
- Total premium due at sign-up

# LGM-Dairy: More Information



**UW Extension**



Understanding Dairy  
Your Source for Market Information

Home | Pub/Software | Dairy Data | Dairy Situation | Graphs | Links | PAFRI All

## Livestock Gross Margin Insurance for Dairy

This section of our website provides information concerning the LGM-Dairy program made available by the Risk Management Agency of USDA. The site is updated as new information becomes available and related new materials are added.

As with other sections of this website by clicking on an active link, you may generate an expanded menu. To make this menu disappear, click on the link again. If you have material that you think you would find useful please contact [Prof. Brian W. Gould](#) with your suggestions.

[http://future.aae.wisc.edu/lgm\\_dairy.html](http://future.aae.wisc.edu/lgm_dairy.html)

- **Background Material Made Available by the RMA**  
This is a collection of information provided by USDA as to introduce the LGM-Dairy program
- **Supporting Software**  
This is a collection of spreadsheet and other software used to exemplify the use of LGM-Dairy
- **Underlying Data**  
This is a collection of data used in the implementation of LGM-Dairy
- **Additional Material Explaining LGM-Dairy**  
Background Material Related to LGM-Dairy

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Download a copy of the free Adobe Acrobat Reader to view and print information provided as PDF files.



## Livestock Gross Margin for Dairy: LGM - Dairy

<http://www.uwex.edu/ces/dairymgt/dairy.cfm> and

- [USDA's Gross Margin Insurance Program for Dairy: What is it and Can it be Used for Risk Management](#) by B.W. Gould, P. Mitchell and V. Cabrera, Univ. of Wisconsin, Aug. 2008
- [Managing the Newly Created LGM-Dairy Insurance Under Seasonal Climate Variability](#), by V.E Cabrera and Daniel Solis, University of Wisconsin-Madison, June 2008
- [LGM-Dairy: Livestock Gross Margin for Dairy](#), a Powerpoint Presentation presented at the Eastern Wisconsin Farm Management Update Seminar, Sept. 12, 2008
- [LGM-Dairy: A Wisconsin Example](#), a Powerpoint Presentation presented at the Eastern Wisconsin Farm Management Update Seminar, Sept. 12, 2008
- [Premium Calculator](#) from RMA's
- [LGM for Cattle RMA Website](#)
- [Understanding Dairy Markets - LGM-Dairy](#)

Victor E. Cabrera, PhD, Assistant Professor and Extension Specialist in Dairy Management, is available to [contact for more information](#).

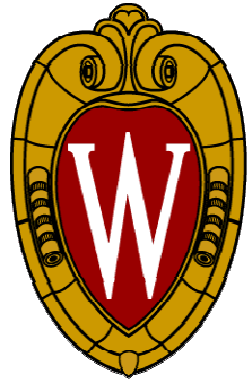
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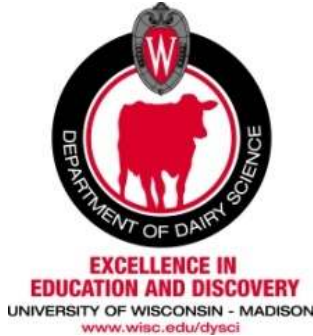
<http://www.rma.usda.gov/livestock/>



# LGM-Dairy: Livestock Gross Margin for Dairy



THE UNIVERSITY  
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**WISCONSIN**  
MADISON



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<http://www.uwex.edu/ces/dairymgt/dairy.cfm>  
[http://future.aae.wisc.edu/lgm\\_dairy.html#5](http://future.aae.wisc.edu/lgm_dairy.html#5)