



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Effectiveness of Margin Protection Program for Dairy Producers for Managing Catastrophic Financial Risks

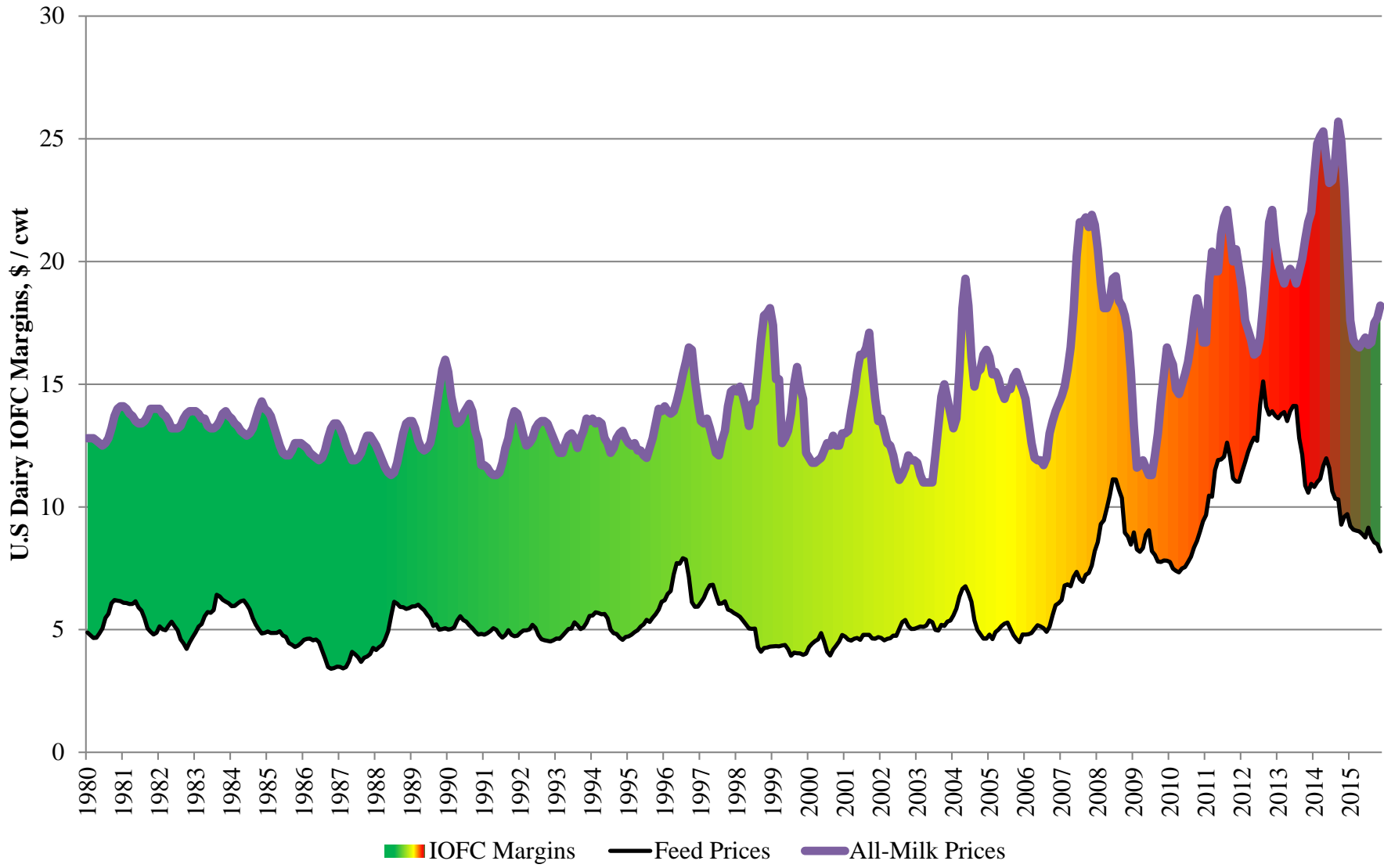
Marin Bozic

NC-1177, Minneapolis, MN, 10/2/2017

UNIVERSITY OF MINNESOTA

Driven to DiscoverSM

Dairy Income over Cost Margin Risk



Margin Protection Program for Dairy Producers

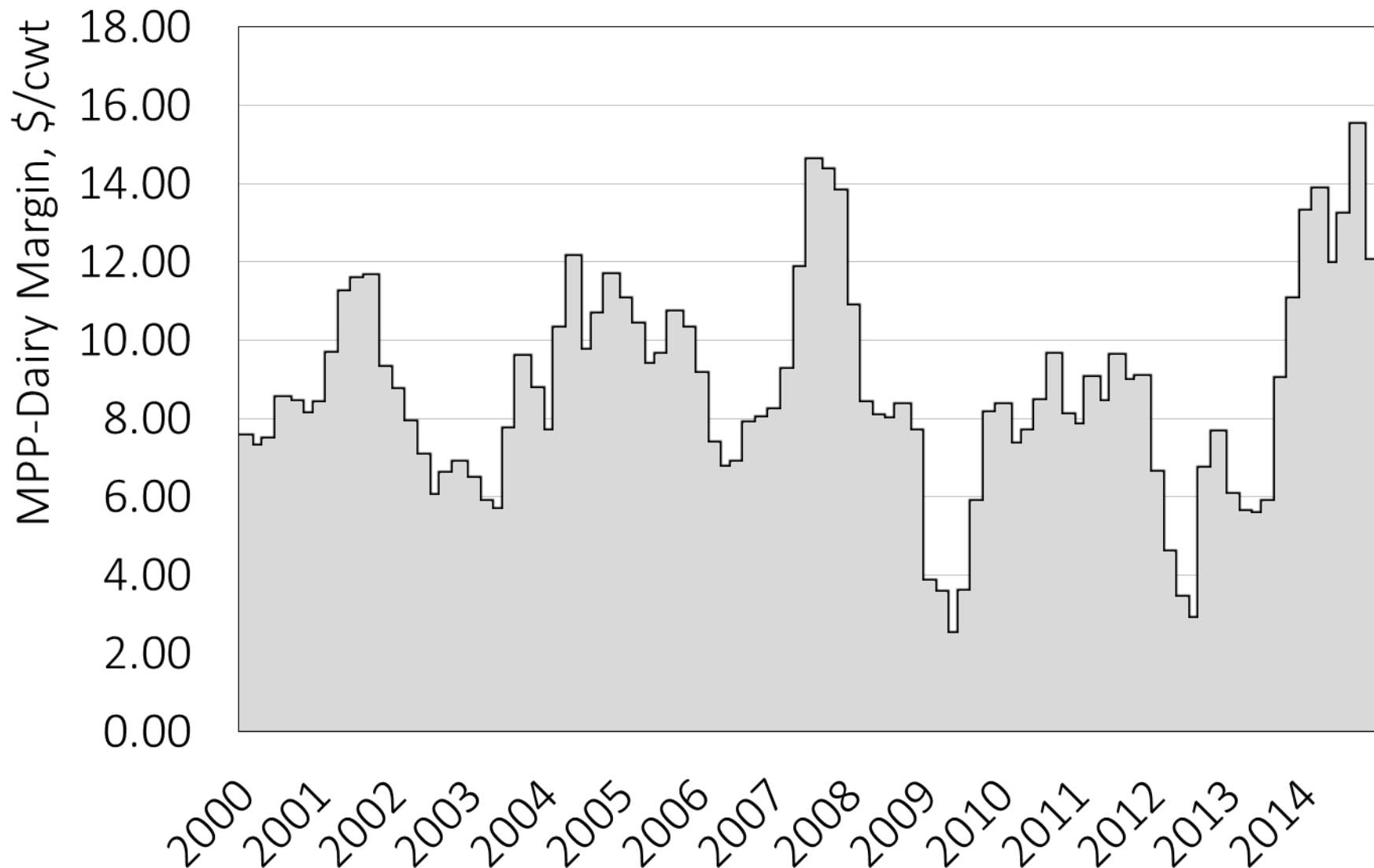
- Voluntary USDA risk management program that replaces MILC program.
- Offers protection against low margins that may come from low milk prices, high feed prices, or a combination of both.
- Provides a payment when “the margin” falls below a specified level, insurable margin levels are \$4.00 to \$8.00 in \$0.50/cwt increments.
- Very simple and hassle-free



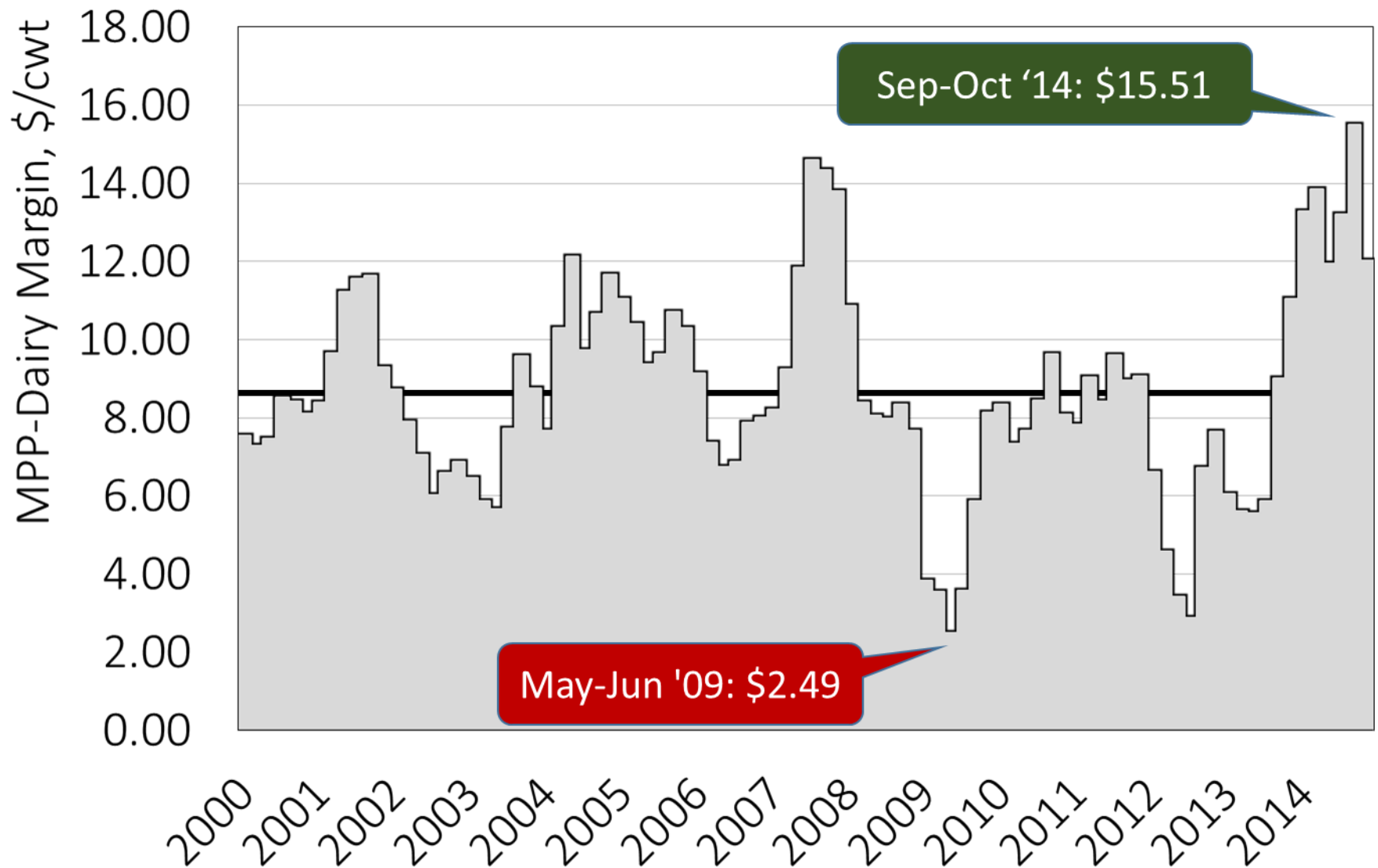
MPP Coverage Levels and Premiums

Coverage Level	First 4mil lbs (\$/cwt)	Above 4 mil lbs (\$/cwt)
\$4.00	\$0.000	\$0.000
\$4.50	\$0.010	\$0.020
\$5.00	\$0.025	\$0.040
\$5.50	\$0.040	\$0.100
\$6.00	\$0.055	\$0.155
\$6.50	\$0.090	\$0.290
\$7.00	\$0.217	\$0.830
\$7.50	\$0.300	\$1.060
\$8.00	\$0.475	\$1.360

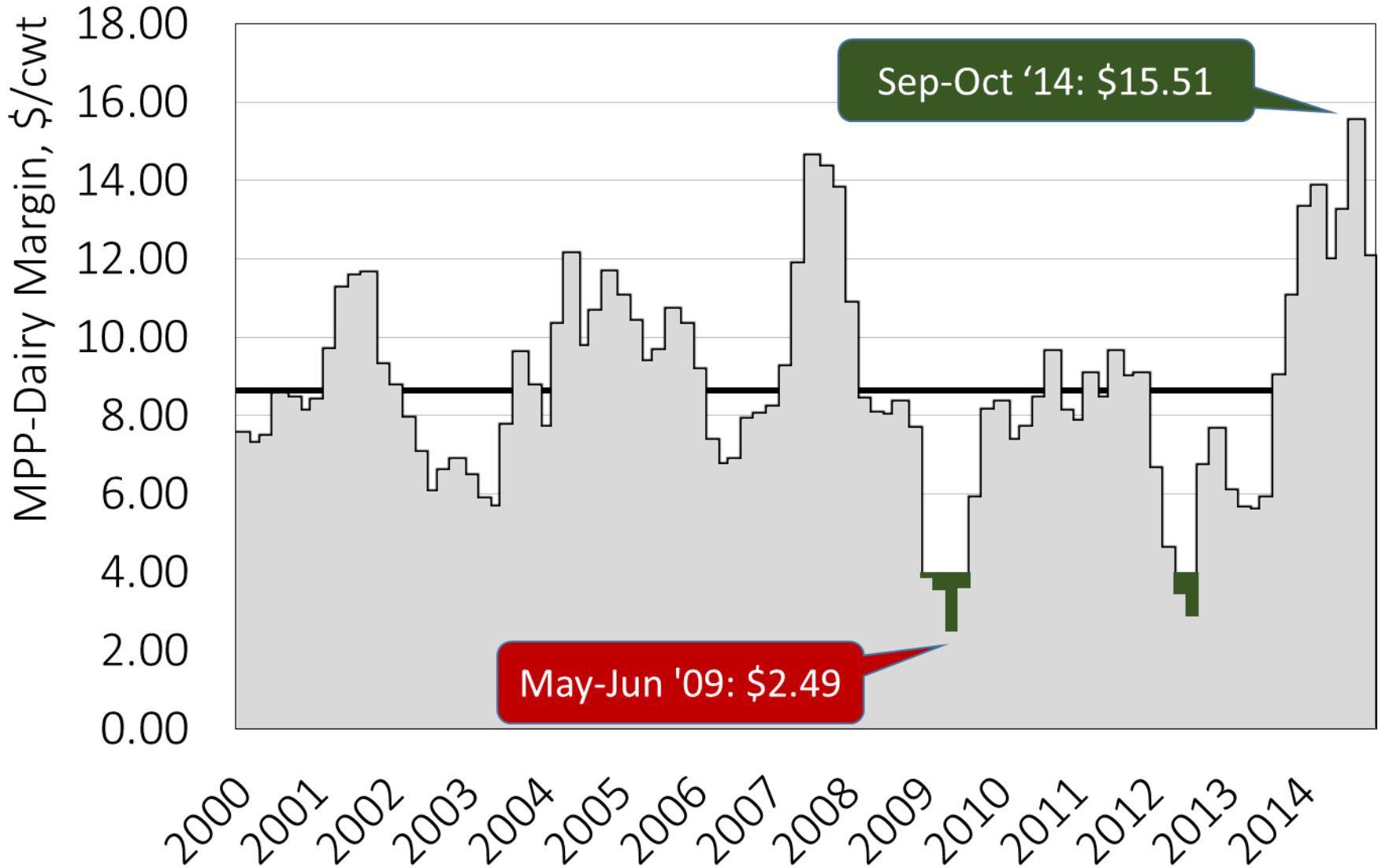
Actual Dairy Production Margin: Historical



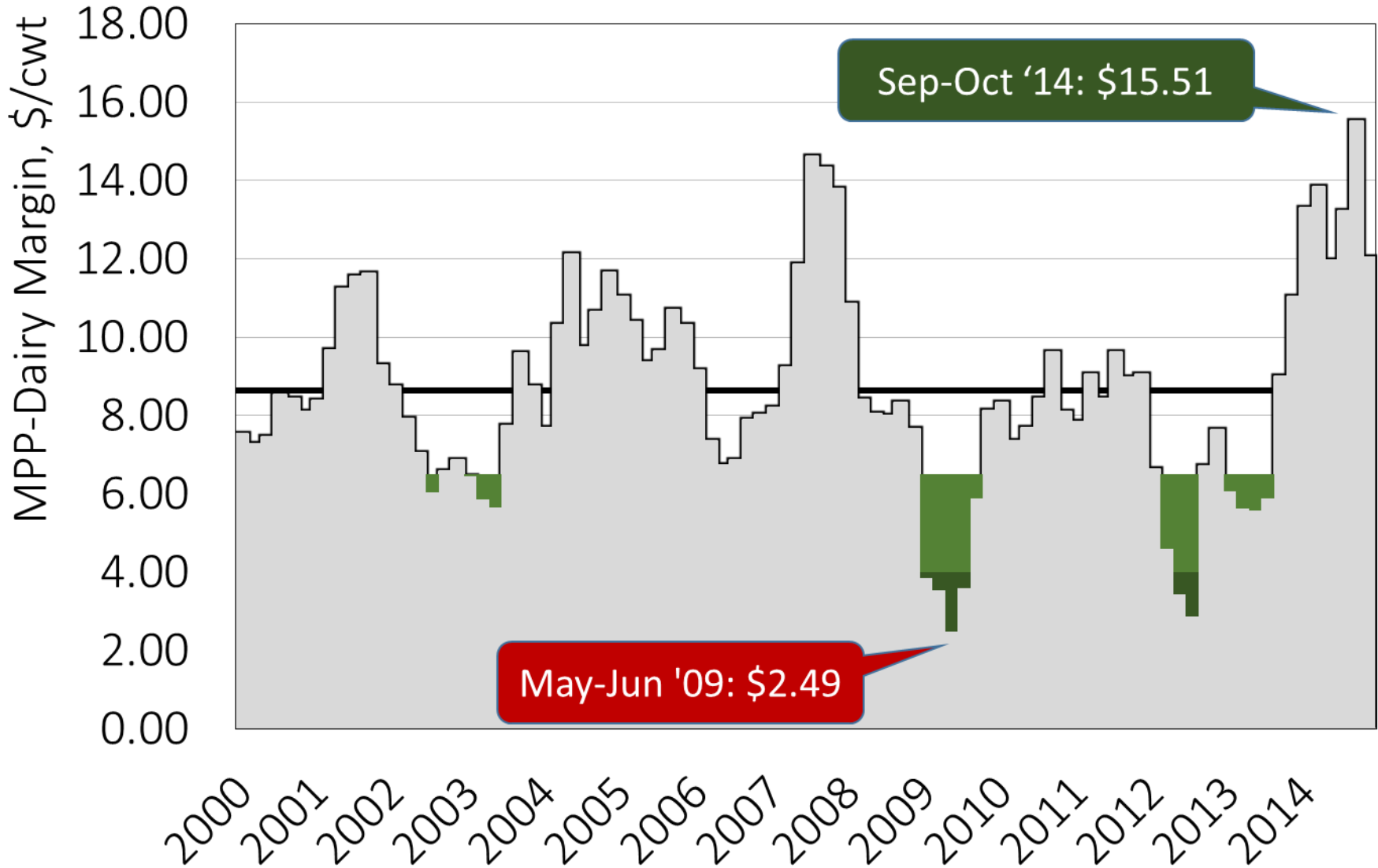
Actual Dairy Production Margin: Historical



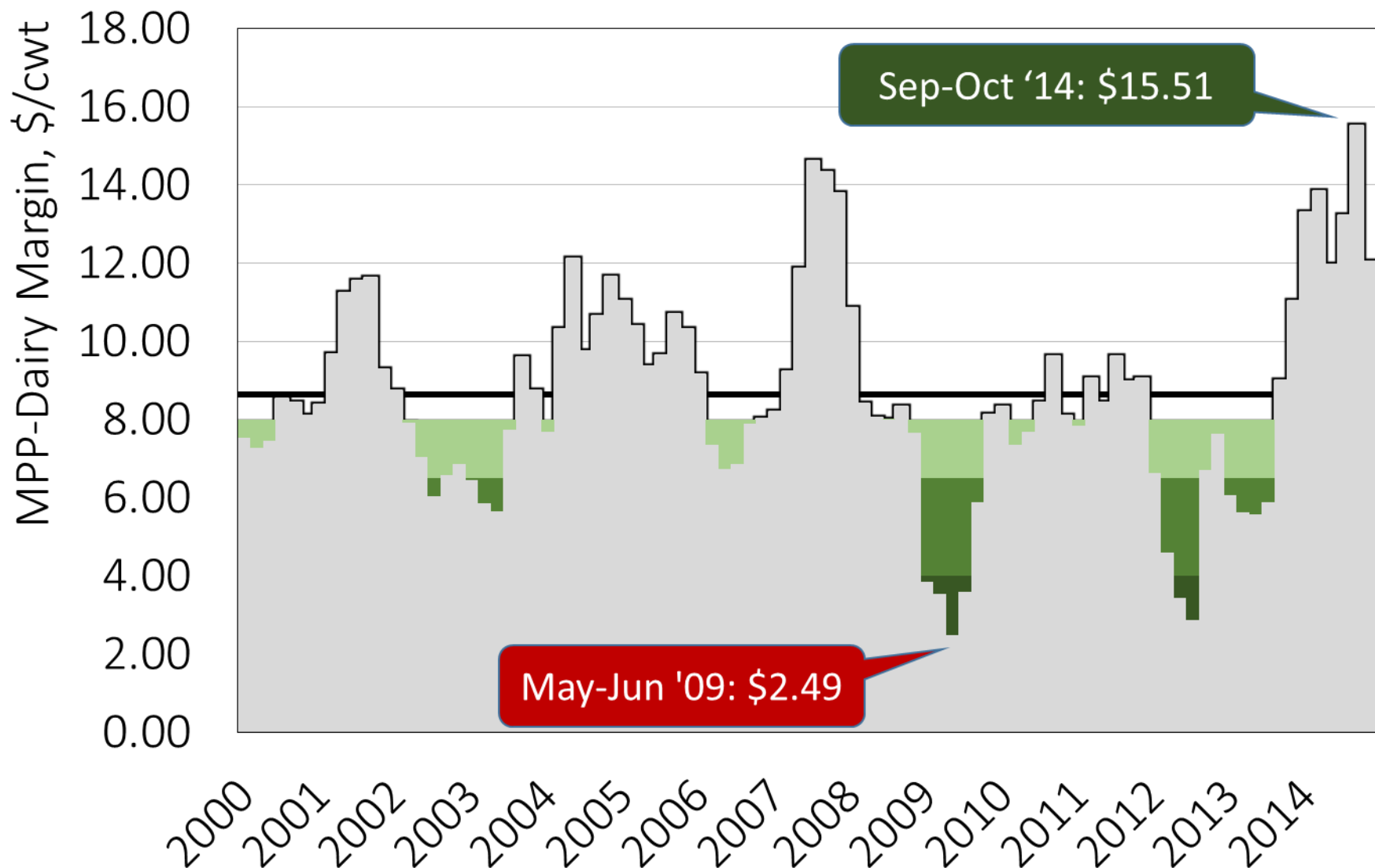
CAT Coverage: \$4.00/cwt



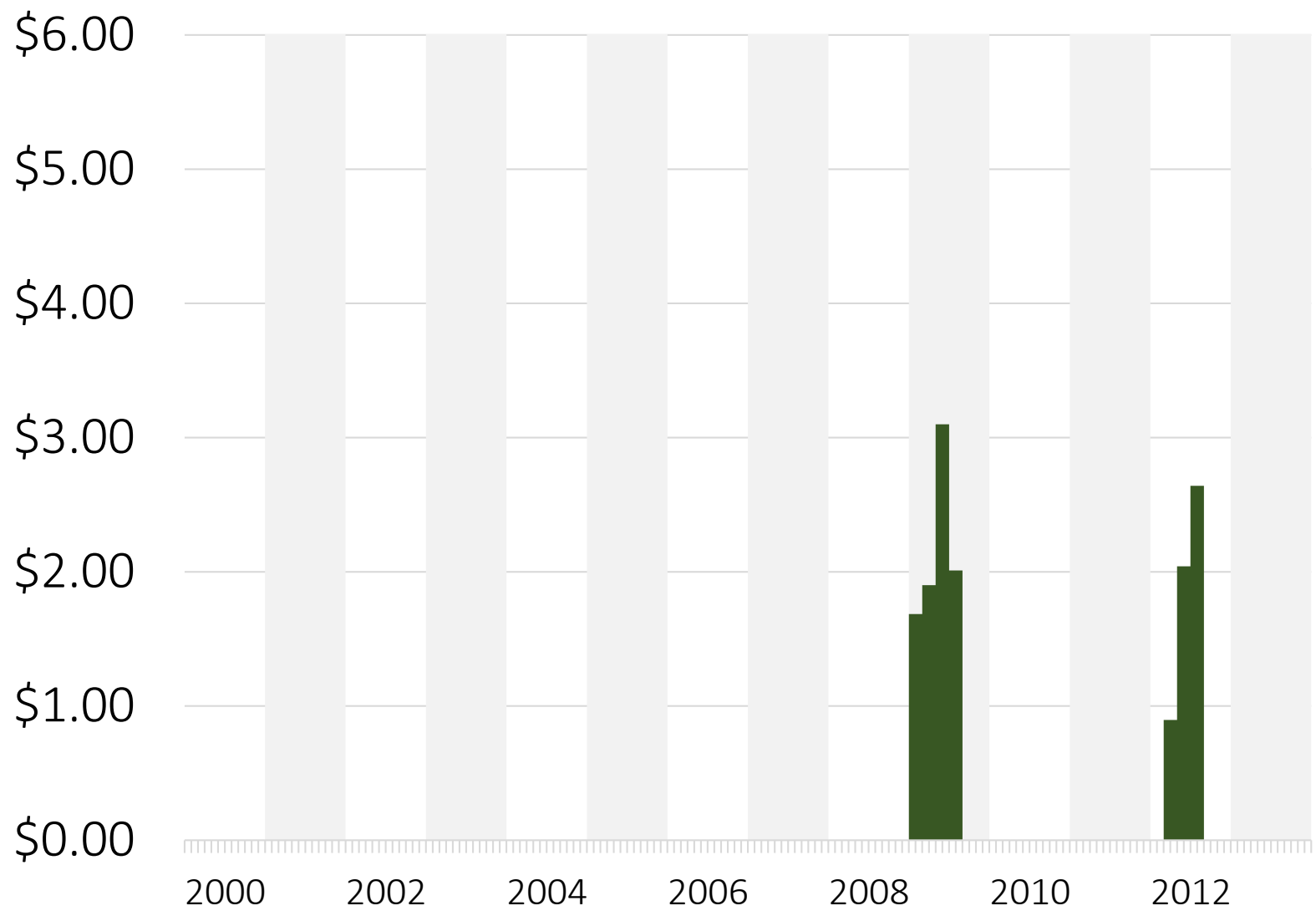
Coverage Level: \$6.50/cwt



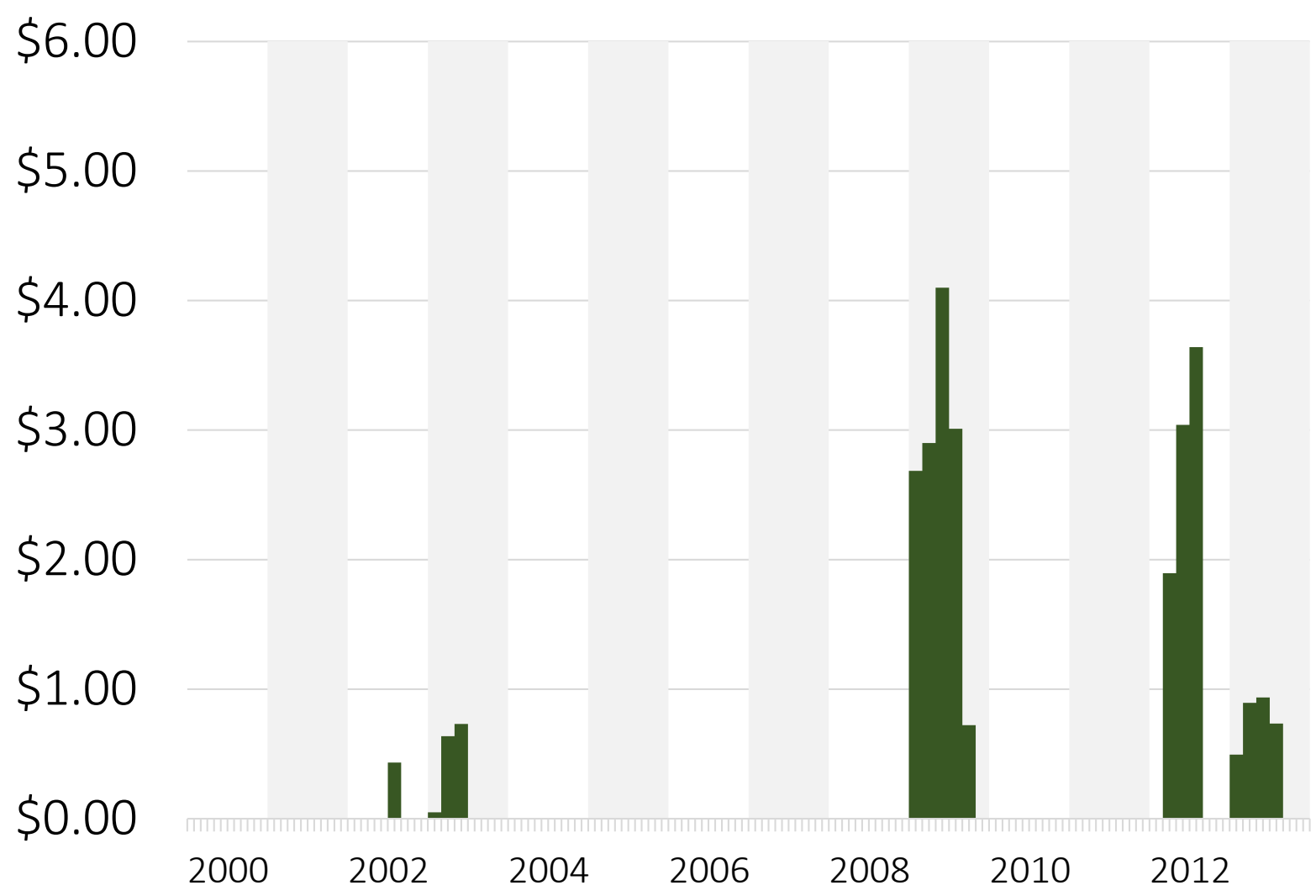
The highest coverage level: \$8.00/cwt



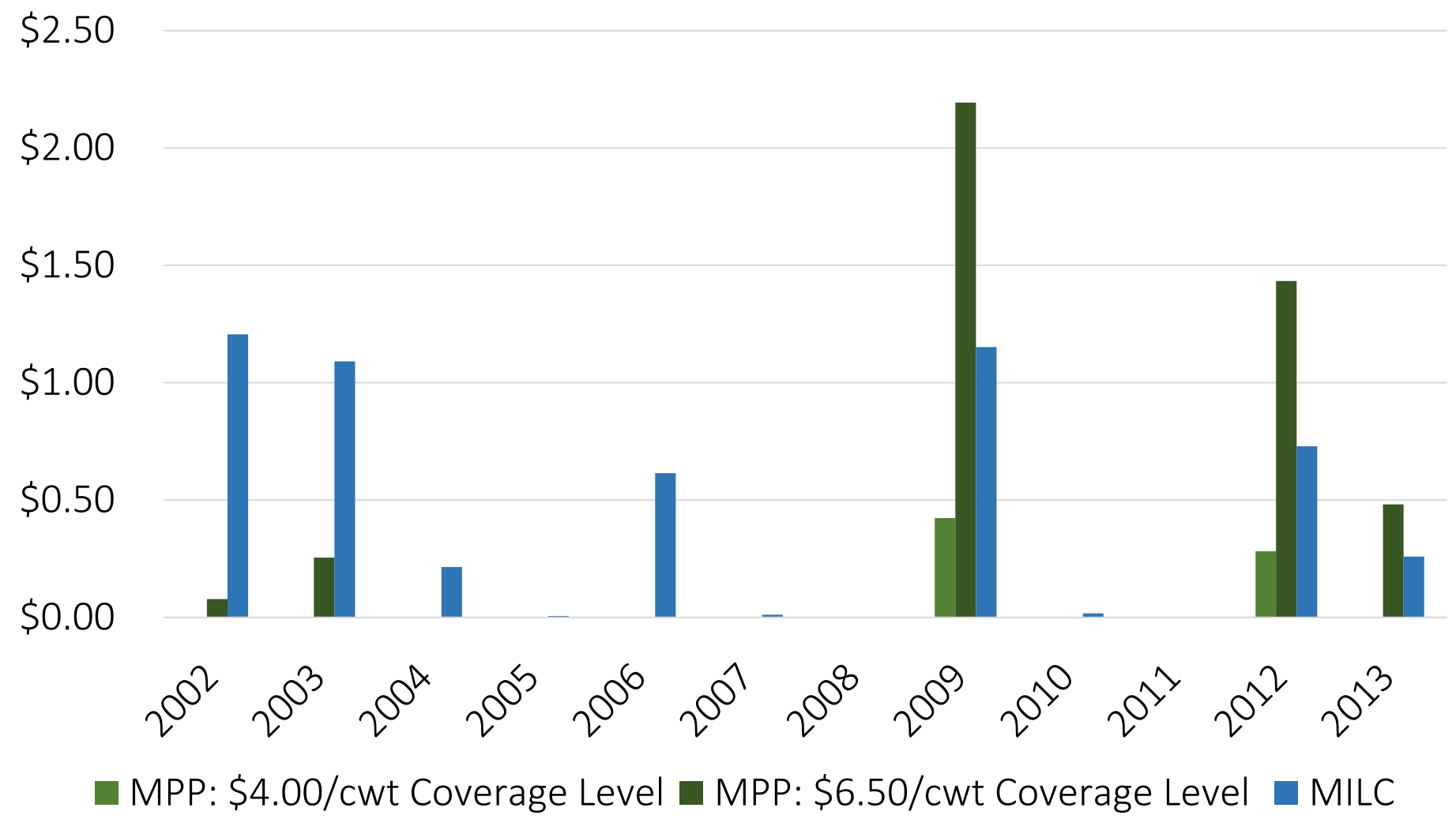
MPP-Dairy Payments: \$5.50 Coverage Level



MPP-Dairy Payments: \$6.50 Coverage Level



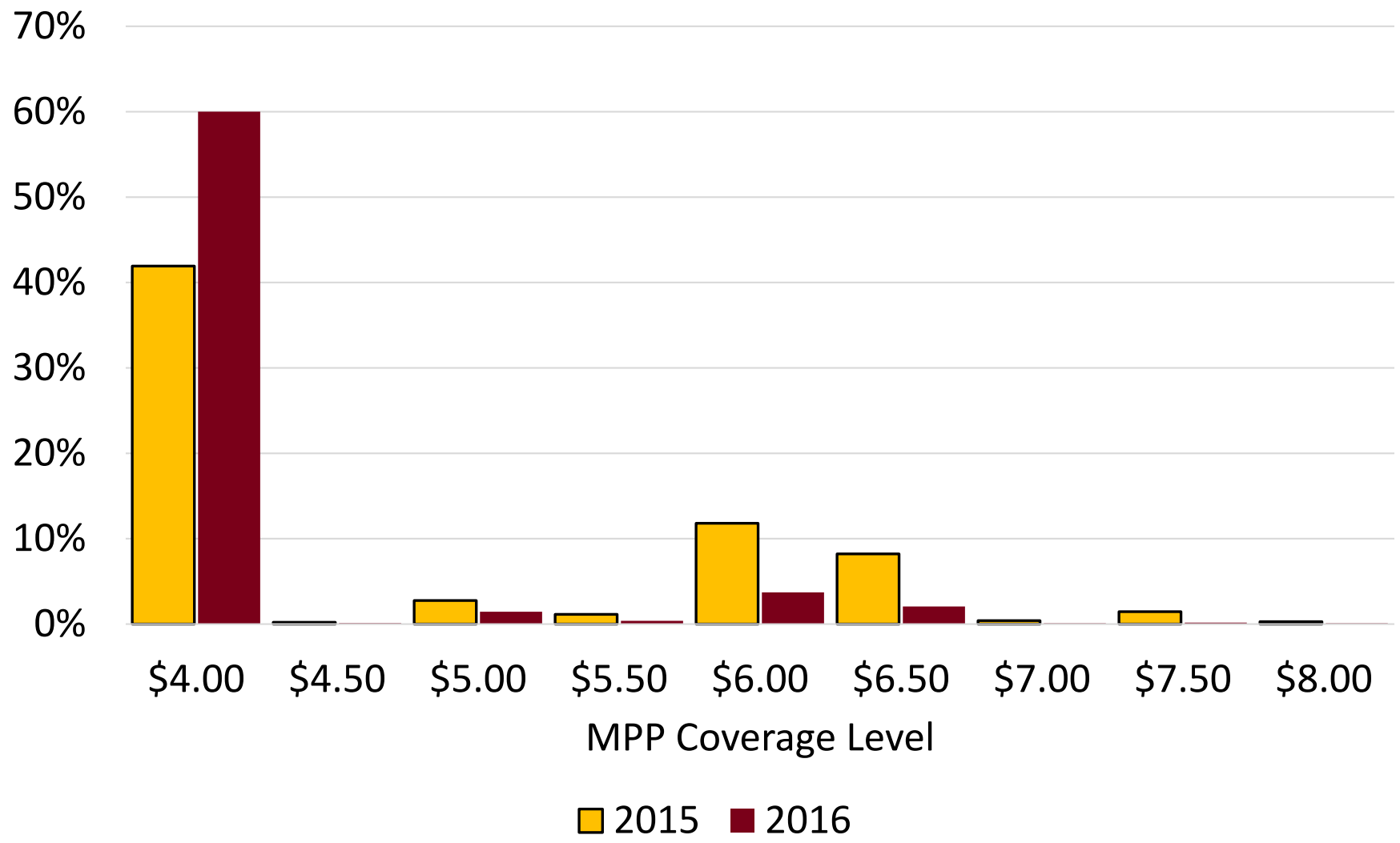
MPP-Dairy Payments: \$6.50 Coverage Level



MPP Coverage as % of 2015 U.S. Milk Production



MPP Coverage as % of 2015 and 2016 U.S. Milk Production





Home FSA Home Help Contact Us

FARM BILL HOME / FARM SAFETY NET / DAIRY PROGRAMS / MARGIN PROTECTION PROGRAM DECISION TOOL

MPP

MPP Advanced

LGM

Margin Protection Program Decision Tool

www.DairyMarkets.org

Farm Name:

Coverage Year:

Annual Production History
(From Form CCC-781)

lbs

Forecast Margin

Select Coverage

2016 Estimate Forecast Not Available

Coverage Percentage:

Participated In 2015 And Paid The \$100 Fee Timely

Covered Annual Production: 3,726,097 lbs

Include Actual Net Revenue

Coverage Level	Administrative Fees & Premiums	Expected Payment	Expected Net Returns
\$8.00	\$17,799	\$23,766	\$5,967
\$7.50	\$11,278	\$13,754	\$2,476
\$7.00	\$8,186	\$6,836	(\$1,350)
\$6.50	\$3,453	\$3,068	(\$386)
\$6.00	\$2,149	\$1,238	(\$911)
\$5.50	\$1,590	\$413	(\$1,177)
\$5.00	\$1,032	\$112	(\$920)
\$4.50	\$473	\$23	(\$449)
\$4.00	\$100	\$3	(\$97)

You have selected to cover 90% of your production history at a \$5.00 margin level. The annual premium and fee for this coverage is \$1,032. The expected payment for the year at this coverage is \$112.

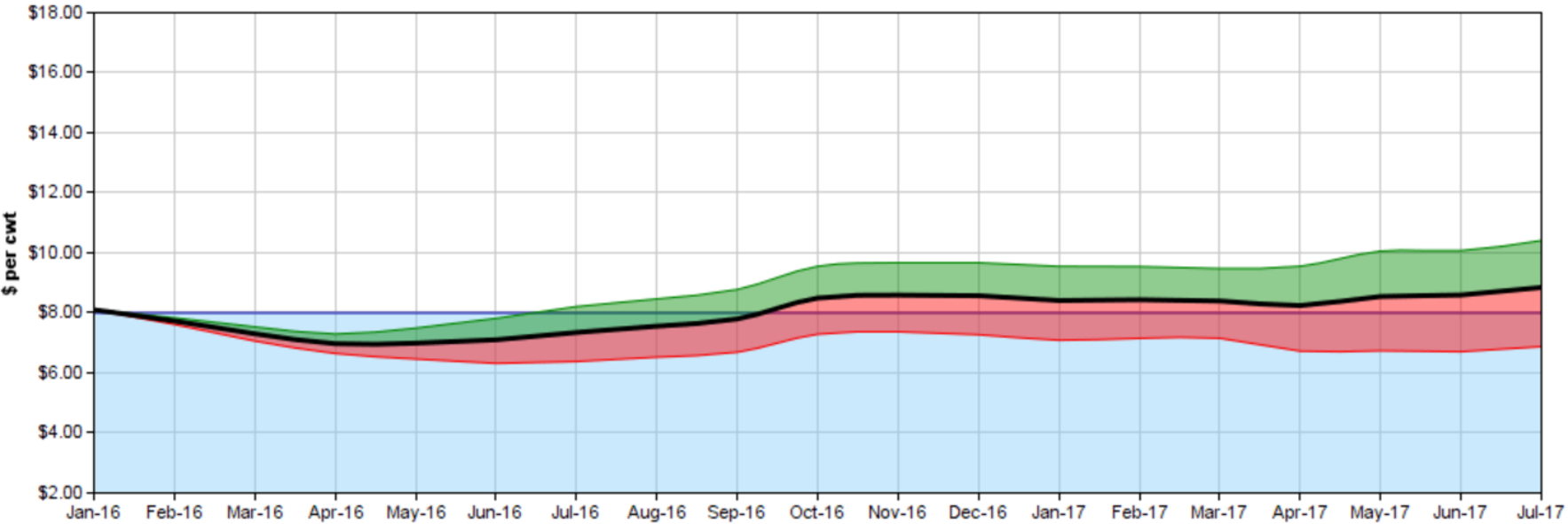
Focus on Probability of Indemnity Payments

Farm Name: Coverage Year: Annual Production History (From Form CCC-781) lbs

Forecast Margin Select Coverage

Probability Table Forecast Graph

Include Actual Margins

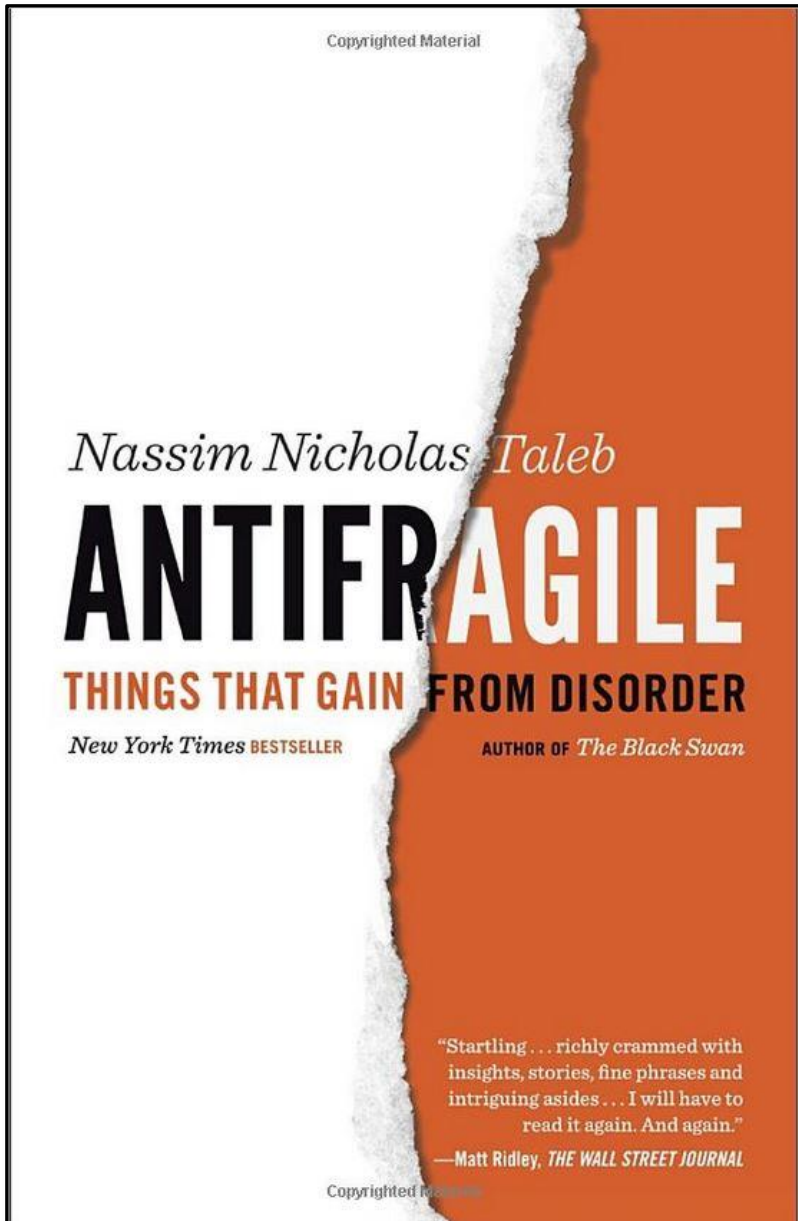


The colored bands show the middle 50% probability interval for forecast margins. There is a 25% chance that the margin could be above the green band and a 25% chance that the margin could be below the red band. The graph data and probabilities are calculated from futures market data available on 03/17/2016.

Focus on Probability of Indemnity Payments

Margin Level	Jan-Feb 2016	Mar-Apr 2016	May-Jun 2016	Jul-Aug 2016	Sep-Oct 2016	Nov-Dec 2016
Expected	\$7.92	\$7.14	\$7.05	\$7.45	\$8.14	\$8.58
< \$8.00	84%	99%	85%	68%	49%	40%
< \$7.50	-	86%	71%	54%	37%	28%
< \$7.00	-	34%	50%	40%	25%	18%
< \$6.50	-	2%	28%	26%	14%	11%
< \$6.00	-	-	12%	14%	8%	5%
< \$5.50	-	-	3%	6%	3%	3%
< \$5.00	-	-	1%	2%	1%	1%
< \$4.50	-	-	-	1%	-	-
< \$4.00	-	-	-	-	-	-

Fragility vs. Robustness



FRAGILE – If your farm would have serious problems surviving a major downturn in profit margins.

ROBUST – If your financial position and cost of production allow you to withstand a very large and prolonged unexpected downturn in profit margins.

ANTIFRAGILE – If your farm benefits from milk and feed price volatility. For example, if you have very strong financial position, low cost of production, *and* have protected against downside in margins. Then as your competitors go out of business, you will have an opportunity to buy their farm at a great price.

Is your farm fragile or robust? A PLS Approach

Profitability: How much money will I lose if the year turns out to be unexpectedly really bad?

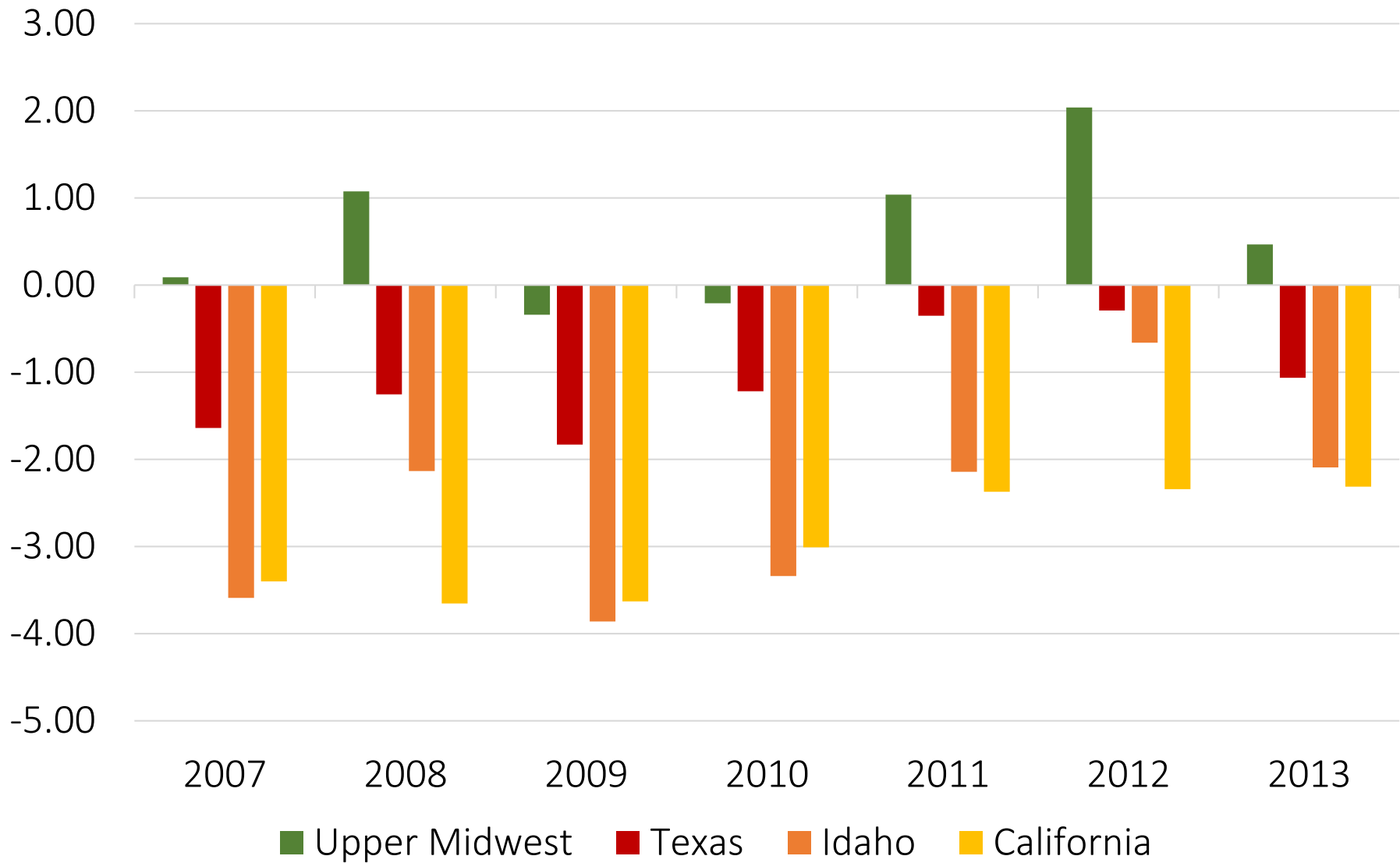


Liquidity: Will my working capital suffice to cover those losses or will I have to take on more debt?

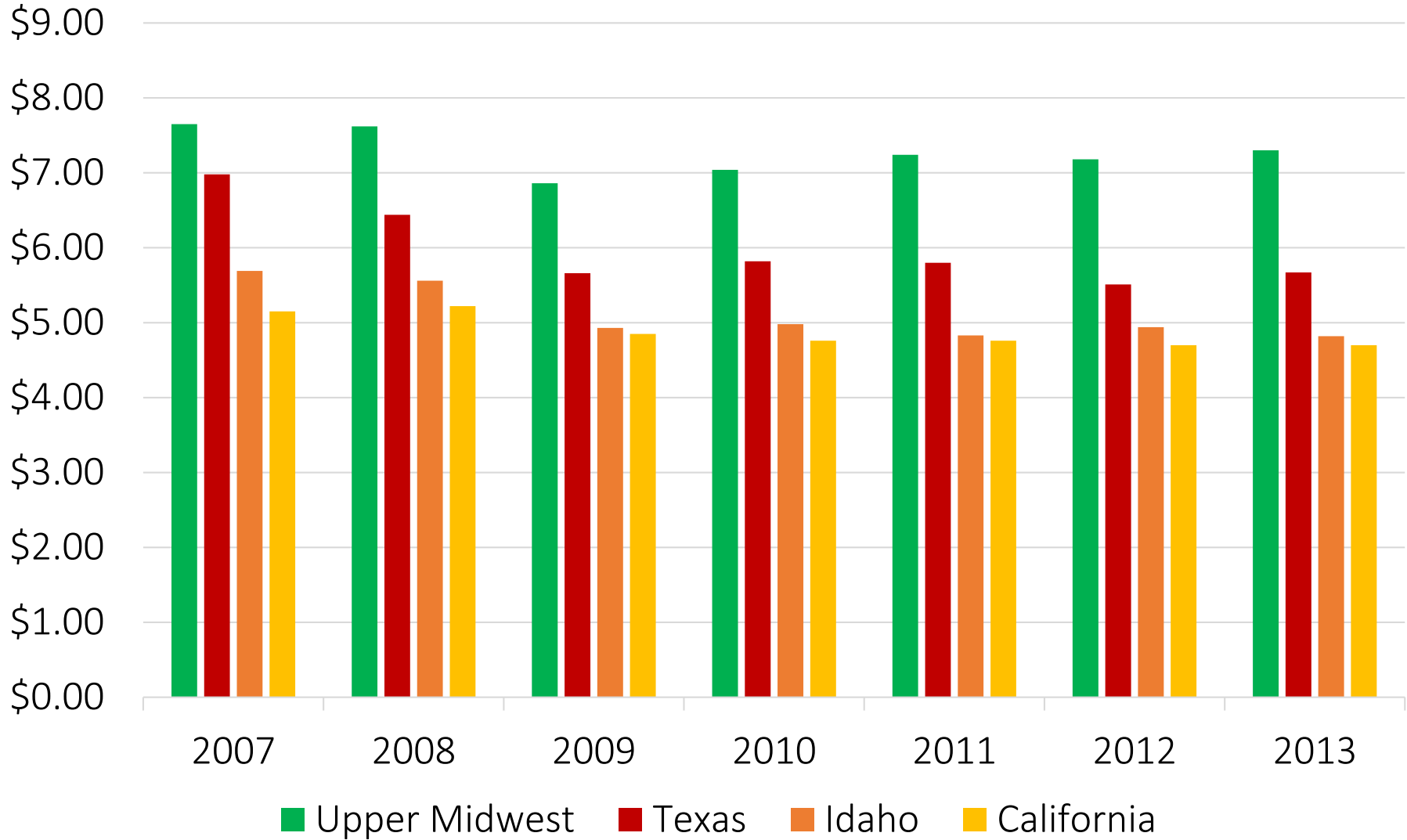


Solvency: If I have to take on more debt, will my lenders want to lend it to me?

IOFC Margin Basis Should Matter



Non-Food Expenses Should Matter



Other Revenue Should Matter

- Dairy producers in some regions of the U.S. engage more substantially in grain production.
- Other sources of income can include revenue from dairy beef, sales of cattle genetics (replacement cows, embryos), non-farm income



Cash-Flow Breakeven IOFC Margin

Cash-Flow Breakeven Farm-Specific Margin =
Expenses, Other than Feed (\$/cwt)
– Other Revenue (\$/cwt)

Cash-Flow Breakeven MPP-Dairy Margin =
Expenses, Other than Feed (\$/cwt)
– Worst Case IOFC Basis over MPP
– Other Revenue (\$/cwt)

Net cash income per cwt =

(Realized IOFC Margin

– Break-even Cash Flow Margin)

– MPP Premium Costs

*+ max(MPP Coverage Level – Realized MPP Margin,
0)*

x MPP Coverage Percentage

x Production History/Expected Milk

Production

*+ (CME Hedged Margin – Realized Margin) x
Percent of Milk Production Hedged*

Assets Value Should Matter



- Drylot vs. Cross-Ventilated Barns
- Purchased vs. Grown Feed



Liquidity

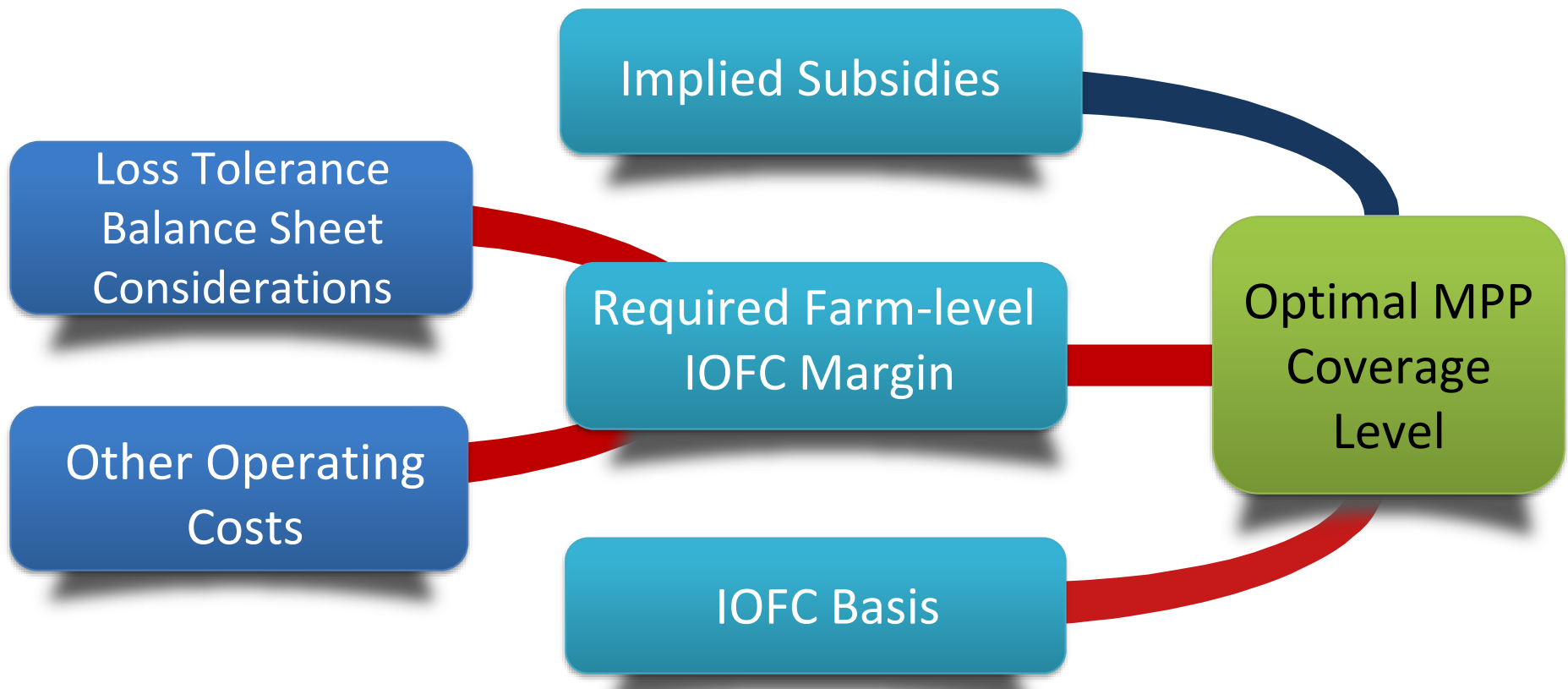
Ending working capital per cow =
Beginning working capital per cow
+ (Net Income per cwt x Realized Milk
Production/ # Milk Cows).

Ending Debt-to-Asset Ratio =

*f(Beginning Debt-to-Asset Ratio,
Asset/Cow*


Impact of Crisis on Value of Farm Assets)

How to make a well-reasoned risk management decision?



Based on 6-case studies

MPP Decision Guide 15-02



**Case Studies with MPP-Dairy Financial Stress-test Calculator:
A Young Dairy Family in Minnesota**

Marin Bozic and Tom Anderson
University of Minnesota and Riverland Community College

A financial stress-test tool has been created to help dairy farm managers in determining how MPP-Dairy might assist in farm financial risk management. This case study illustrates the use of the stress-test tool by a young dairy family in Minnesota.

The National Program on Dairy Markets and Policy released Advanced MPP-Dairy Calculator in July 2015 to support risk management decision making by U.S. dairy producers. The advanced tool enables dairy producers to create their own stress-test scenario with low milk prices, high feed costs or a combination of both. The tool evaluates the impact of low IOFC margins on a dairy farm profitability, liquidity and solvency. In this case study, produced in collaboration with Farm Business Management Education Program of the Riverland Community College, we illustrate the use of tool by a young dairy family in Minnesota.

Bob and Kelly entered into a contract with his parents for the cows with payments coinciding with the sale of cull cows over the next 4 – 5 years. Bob and Kelly were married two years ago. Kelly works off the farm after completing her degree, but provides considerable help with the calves. Bob and Kelly are milking 233 cows in their herd. Good quality genetics had been used on the farm for many years, but the production was less than they had desired. They recently identified stray voltage as causing abortions and cow loss. Since taking over the operation the milk production has improved and pregnancy rates have skyrocketed. Expected yield in 2016 is 20,500 pounds per cow annually, so they expect to ship 4,776,500 pounds of milk in 2016. Their MPP-Dairy Production History, as established on the form CCC-781 in 2014, was 4,060,025. Because they participated in MPP-Dairy in 2015, their production history from form CCC-781 has been multiplied by 1.0087 and by 1.0261 for 2016, so the total production history for 2016 is 4,202,235 pounds.

Case Study: B & K Dairy
Bob and Kelly Peterson have operated B & K Dairy for 4 years. After graduating from college with honors, Bob wanted to return to the farm and his parents wanted to sell him the cows. The plan was to purchase the cows from his parents, rent the land and lease the machinery from his parents.

B & K Dairy Balance Sheet 1/1/2016			
Current Assets	\$324,254	Current Liabilities	\$133,868
Intermediate Assets	\$762,124	Intermediate Liabilities	\$430,767
Long Term Assets	\$50,109	Long Term Liabilities	\$0
Personal Assets	\$42,300	Personal Liabilities	\$24,129
Total Assets	\$1,178,787	Total Liabilities	\$564,635
		Equity	\$590,023

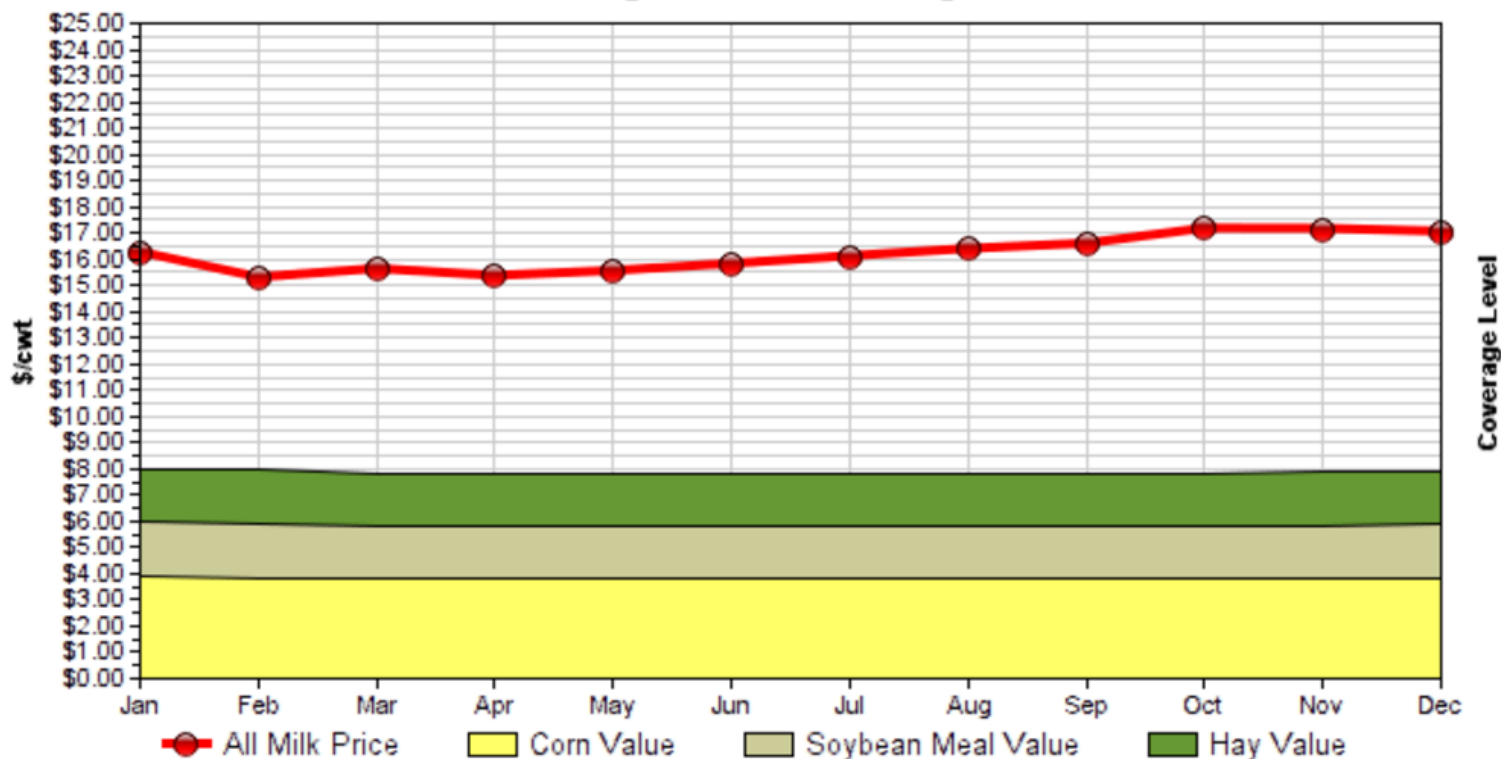
1

- *A Young Dairy Family in Minnesota*
- *The Costs and Benefits of Homegrown Feeds on a Dairy in Minnesota*
- *An Efficient Large Dairy in California*
- *A Financially Strained Dairy in Central Valley in California*
- *Dealing with Declining Milk Price Basis in Michigan*
- *Insights from Northeast Dairy Farm Summary*

Step 1: A Ruthless IOFC Margin Scenario Analysis

Change All Milk Prices

2016 Margin Protection Program



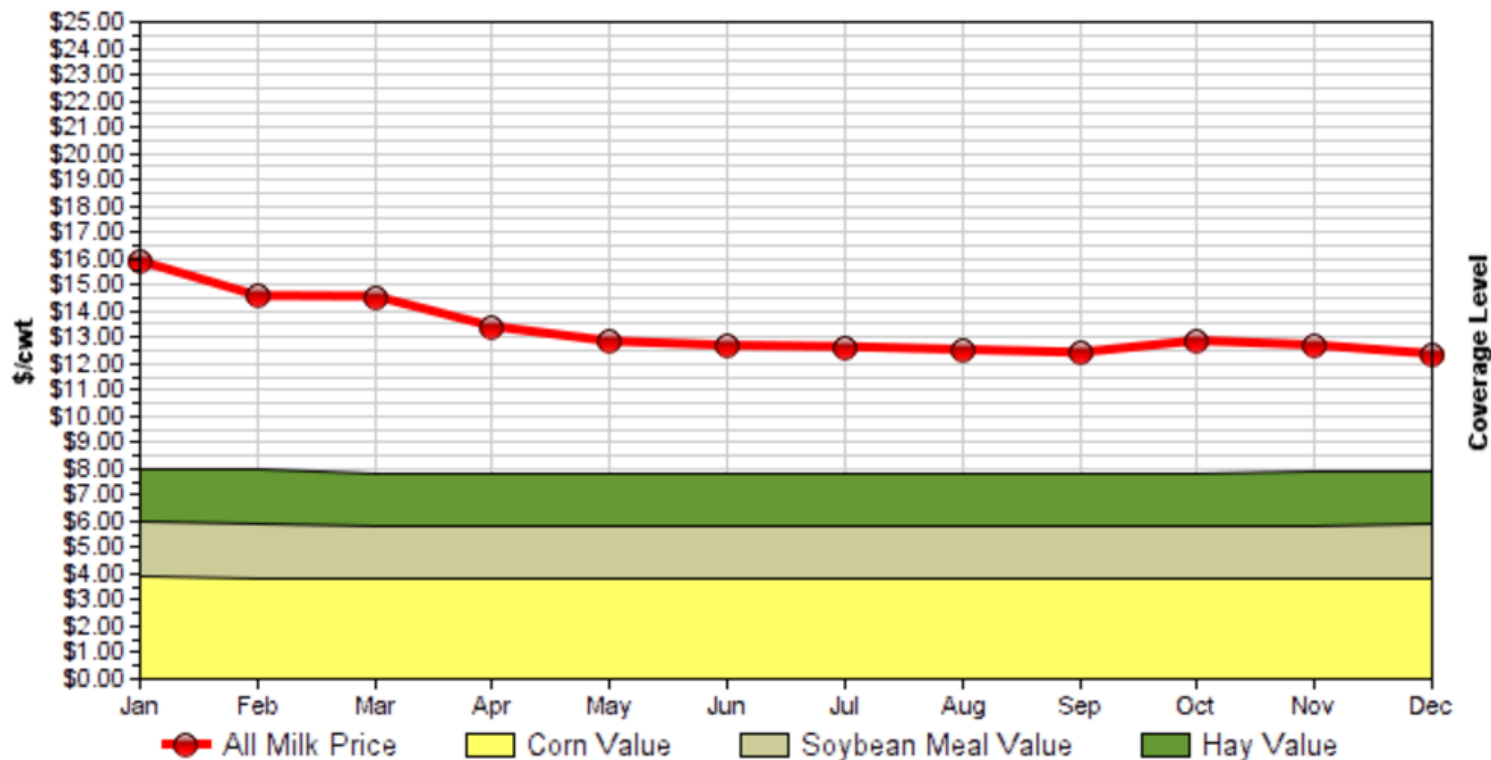
<input checked="" type="checkbox"/>	All Milk Price:	16.24	15.28	15.61	15.34	15.53	15.80	16.09	16.37	16.57	17.15	17.14	17.03
<input type="checkbox"/>	NASS Hay Price:	149	149	148	148	147	146	146	146	146	146	147	147
<input type="checkbox"/>	AMS SBM Price:	280	280	273	272	272	272	274	275	275	275	275	275
<input type="checkbox"/>	NASS Corn Price:	3.63	3.60	3.56	3.53	3.53	3.53	3.53	3.53	3.54	3.55	3.57	3.60
	Ration Value:	7.99	7.96	7.85	7.81	7.80	7.79	7.80	7.81	7.82	7.83	7.87	7.90
	Margin:	8.25	7.32	7.76	7.53	7.73	8.01	8.29	8.56	8.75	9.32	9.27	9.13

Step 1: A Ruthless IOFC Margin Scenario Analysis

Change All Milk Prices



2016 Margin Protection Program



<input checked="" type="checkbox"/>	All Milk Price:	15.87	14.55	14.53	13.38	12.82	12.66	12.61	12.50	12.39	12.84	12.67	12.34
<input type="checkbox"/>	NASS Hay Price:	149	149	148	148	147	146	146	146	146	146	147	147
<input type="checkbox"/>	AMS SBM Price:	280	280	273	272	272	272	274	275	275	275	275	275
<input type="checkbox"/>	NASS Corn Price:	3.63	3.60	3.56	3.53	3.53	3.53	3.53	3.53	3.54	3.55	3.57	3.60
	Ration Value:	7.99	7.96	7.85	7.81	7.80	7.79	7.80	7.81	7.82	7.83	7.87	7.90
	Margin:	7.88	6.59	6.68	5.57	5.02	4.87	4.81	4.69	4.57	5.01	4.80	4.44

Building Your Farm Profile

Production & Prices

Cows	233
Milk Per Cow (lbs/yr)	20,500
Expenses, Other than Feed (\$/cwt)	\$8.69
Worst-Case IOFC Basis over MPP (\$/cwt)	-\$1.25
Other Revenue (beef, crops, etc.) (\$/cwt)	\$1.82

Risk Management

MPP-Dairy: Production History	4,202,325
MPP-Dairy: Coverage Percentage	90%
CME & Other: % of 2016 Milk and Feed Hedged	0%
CME & Other: Average Hedged IOFC	\$0.00

Financials

Working Capital Per Cow	\$817
Assets Per Cow	\$7,375
Debt-to-Asset Ratio (At Market Value)	50%
Effect of Crisis on Assets Value	-10%

Scenario: Average MPP-Dairy Margin in 2016	\$5.41
--	--------

Diagnostics

Expected 2016 Milk Production	4,776,500
Cash-Flow Breakeven MPP-Dairy Margin	\$8.12

Your Farm Profile

Stress-test outlook scenario

An example: A Large Financially Strained CA Dairy in Central Valley

Category	Budget
Cows	1,400
Expenses, Other than Feed (\$/cwt)	\$6.80
Worst-Case IOFC Basis over MPP	-\$2.50
Revenue Per Cwt	\$1.00
Working Capital Per Cow	\$643
Assets Per Cow	\$16,643
Debt-to-Asset Ratio (At Market Value)	41%
Effect of Crisis on Assets Value	-10%

Coverage Choice	MPP-Dairy Costs		Profitability	Liquidity	Solvency
	Total	\$/cwt	Net Income	Working Capital Per Cow	Debt/Asset Ratio
No MPP	\$0.00	\$0.00	-\$3.60	-\$276	48.5%
\$4.00	\$100	\$0.00	-\$3.60	-\$276	48.5%
\$4.50	\$5,471	\$0.02	-\$3.56	-\$266	48.5%
\$5.00	\$11,043	\$0.03	-\$3.31	-\$200	48.3%
\$5.50	\$26,556	\$0.07	-\$3.01	-\$125	48.0%
\$6.00	\$40,827	\$0.11	-\$2.66	-\$35	47.7%
\$6.50	\$75,783	\$0.21	-\$2.36	\$42	47.5%
\$7.00	\$215,087	\$0.60	-\$2.34	\$46	47.4%
\$7.50	\$275,577	\$0.77	-\$2.11	\$106	47.3%
\$8.00	\$357,146	\$1.00	-\$1.93	\$150	47.1%

Summary conclusions from case studies

- Basis (which will be the new dairy policy fight in 2017/18) is endogenous, i.e. in equilibrium it's inversely related to non-feed expenses. Changing policy to accommodate regional differences in feed costs or milk prices may slow down spatial and size-based structural changes in milk production.
- For most dairies, the “free” CAT level (\$4.00/cwt) does not materially reduce their losses in worst-case scenario analysis.
- Highly leveraged dairies should combine private risk management tools with MPP-Dairy. MPP in itself will not suffice.
- Meaningful risk management objectives:
 - Preserve working capital above \$X/cow (e.g. \$300/cow)
 - Maintain debt/asset ratio below \$X% (e.g. 55%)