

2019 Michigan Milk Market Situation and Outlook

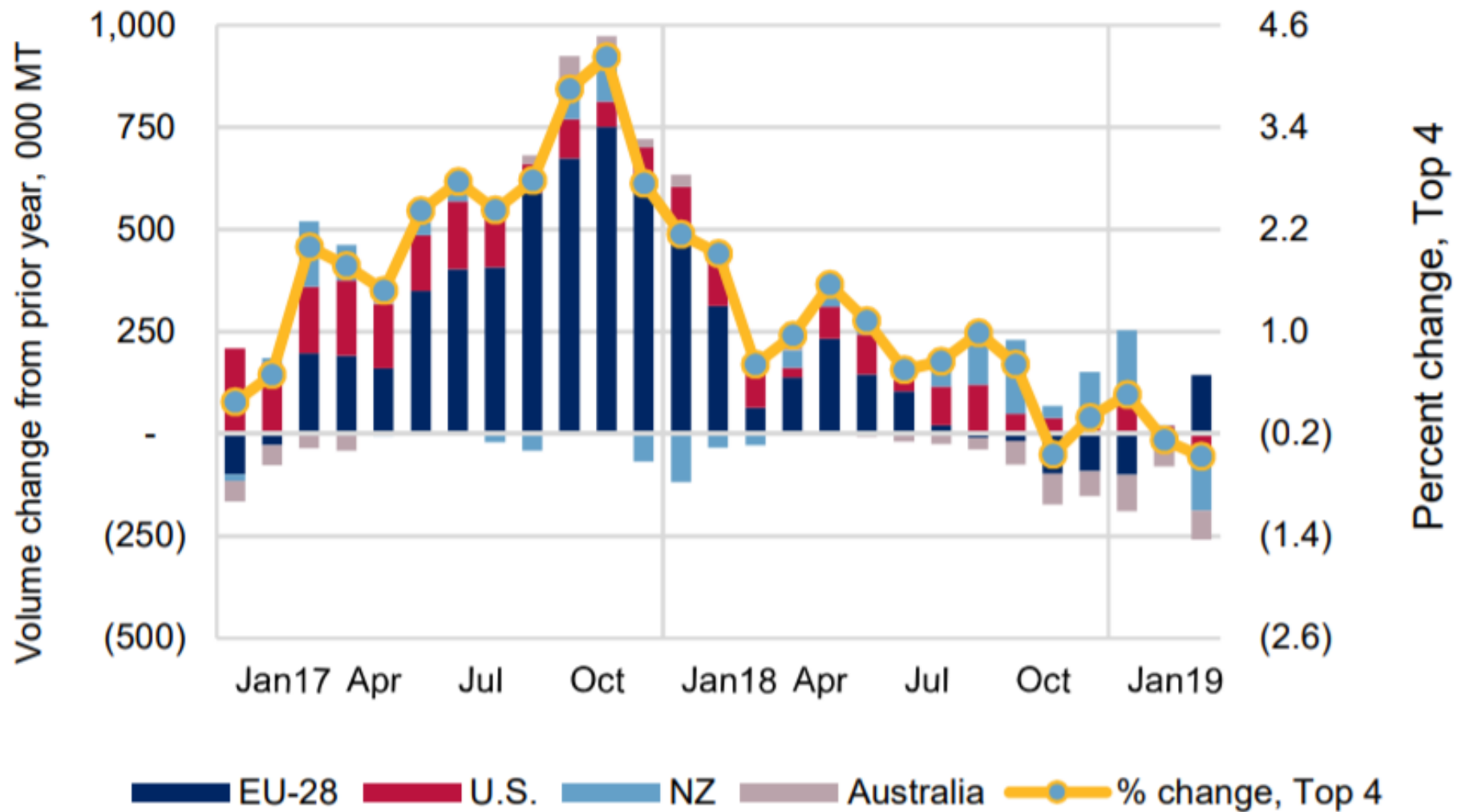
Christopher Wolf
Michigan State University

Stressed Dairy Farm Profit Margins

Beginning in 2015--Two issues

- Low world milk prices relative to costs and trade issues affecting US prices
- Balancing capacity and market adjustment charges in Michigan

Milk Production Change from Prior Year, Top 4 Global Suppliers

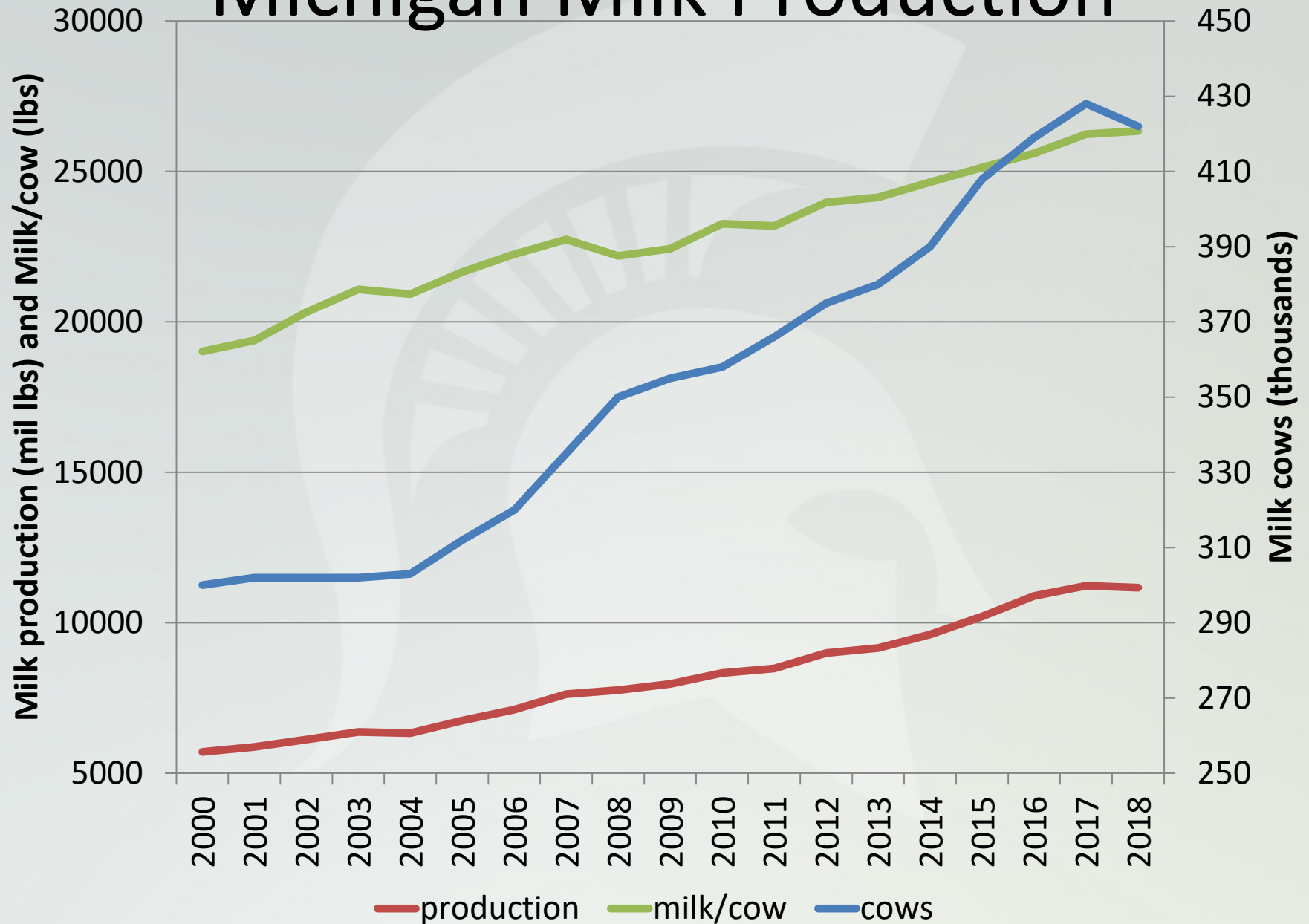


Source: USDEC

Michigan Dairy Farm Profitability

Year		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Milk Price	\$/cwt	13.44	20.21	19.41	13.31	16.88	20.65	18.67	20.63	24.28	17.06	15.07	17.14	15.22
ROE	%	5.4	13.3	7.5	-1.6	7.7	13.7	11.2	9.2	12.5	2.2	-1.4	0.7	0.5
ROA	%	5.5	11.3	7.0	0.4	7.0	11.2	9.3	7.8	10.3	2.6	-0.1	1.5	1.5
OPM	%	19.4	33.1	23.1	1.8	23.9	33.5	30.3	26.2	31.2	10.4	-0.2	5.9	5.6
ATO	%	28.2	34.1	30.5	22.5	29.2	33.3	30.7	29.7	33.1	25.2	26.0	27.0	26.3

Michigan Milk Production



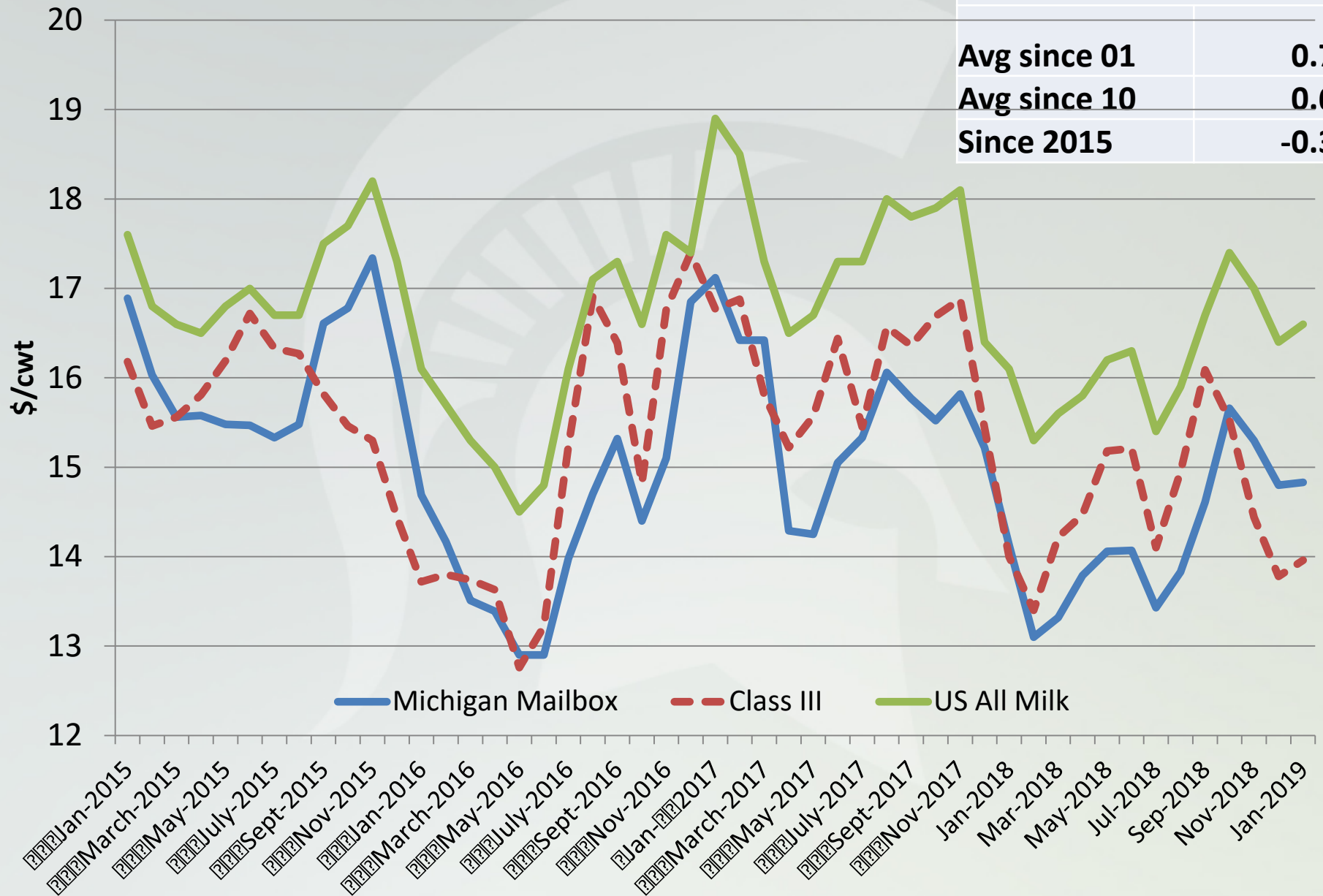
\$1/cwt = \$72000/year for average herd

MI Mailbox Milk-Class III

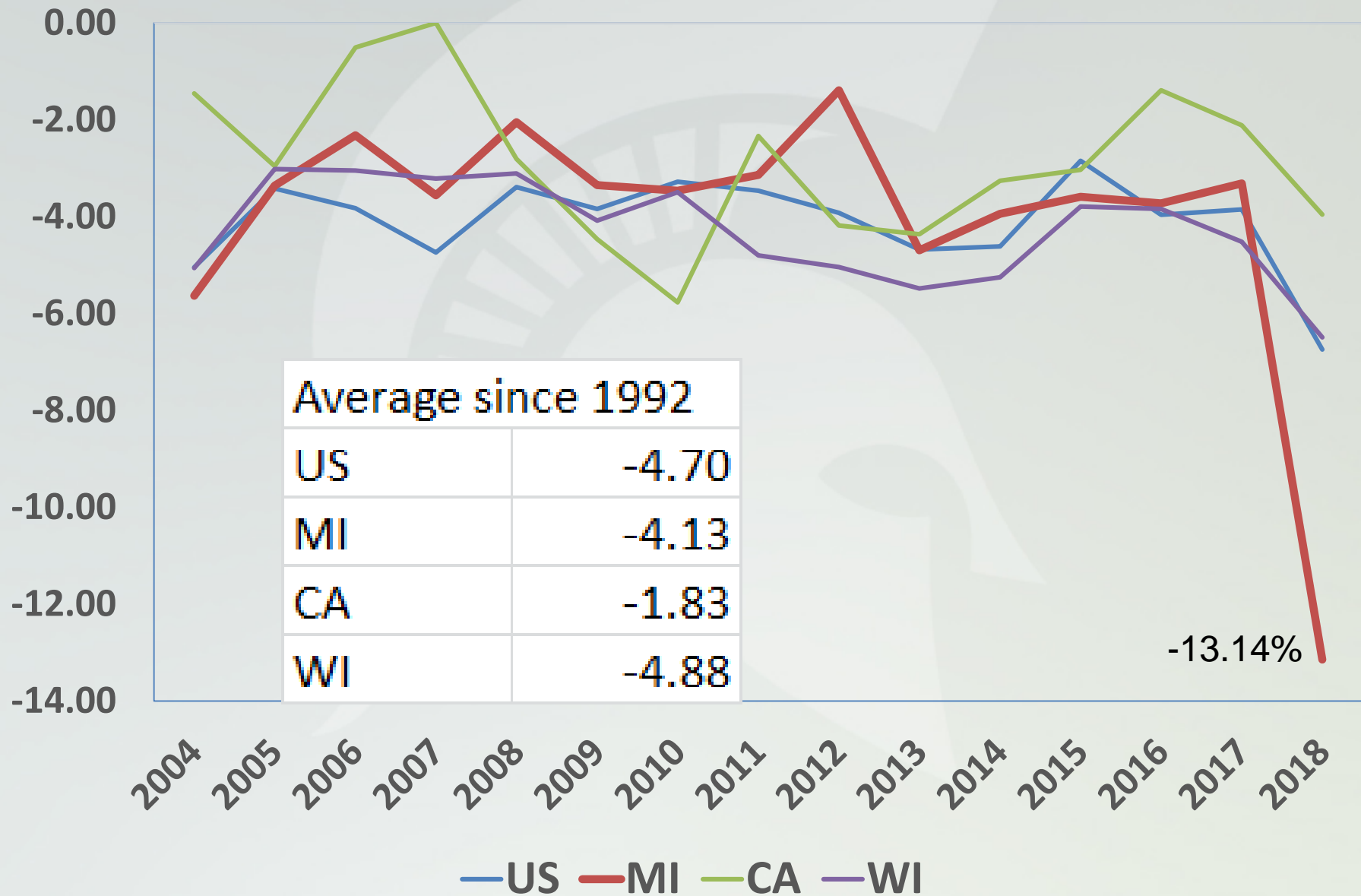
Avg since 01 **0.74**

Avg since 10 **0.64**

Since 2015 **-0.30**



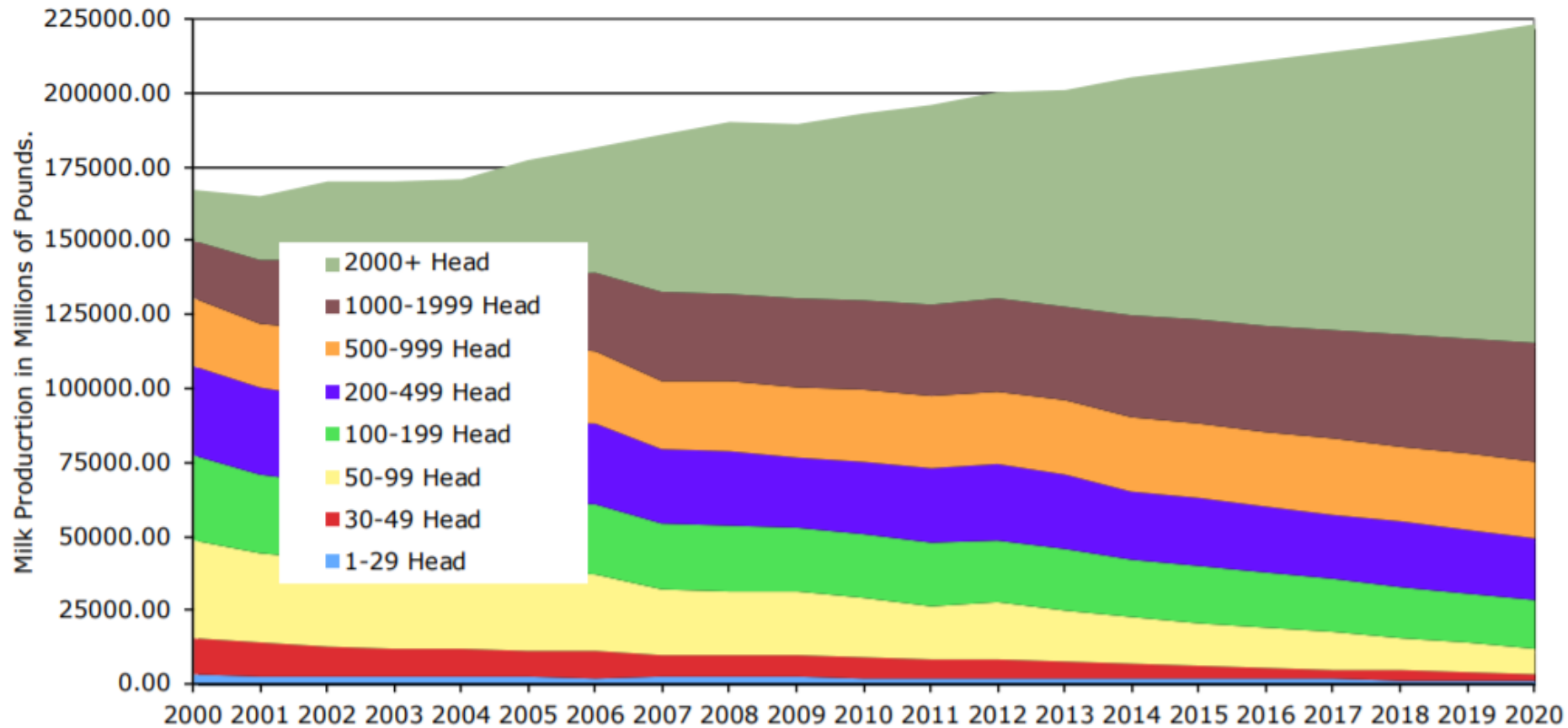
Annual percent decline in licensed herds



US Dairy Herd Structure

Herd Size	Herds	Cows	Sales
		%	
<100	64.3	12.7	10.9
100-499	26.9	21.3	21.2
500-999	3.8	10.7	11.5
1000+	5.0	55.2	56.4

Herd size and Milk Production



U.S. DAIRY EXPORTS BY THE NUMBERS



NEARLY
1 OUT OF 6    
GALLONS  

TURNED INTO DAIRY PRODUCTS
AND INGREDIENTS SOLD
IN OTHER COUNTRIES.

\$5.59 BILLION

IN ANNUAL U.S. DAIRY
EXPORT SALES

619% INCREASE
IN EXPORTS
SINCE 1995

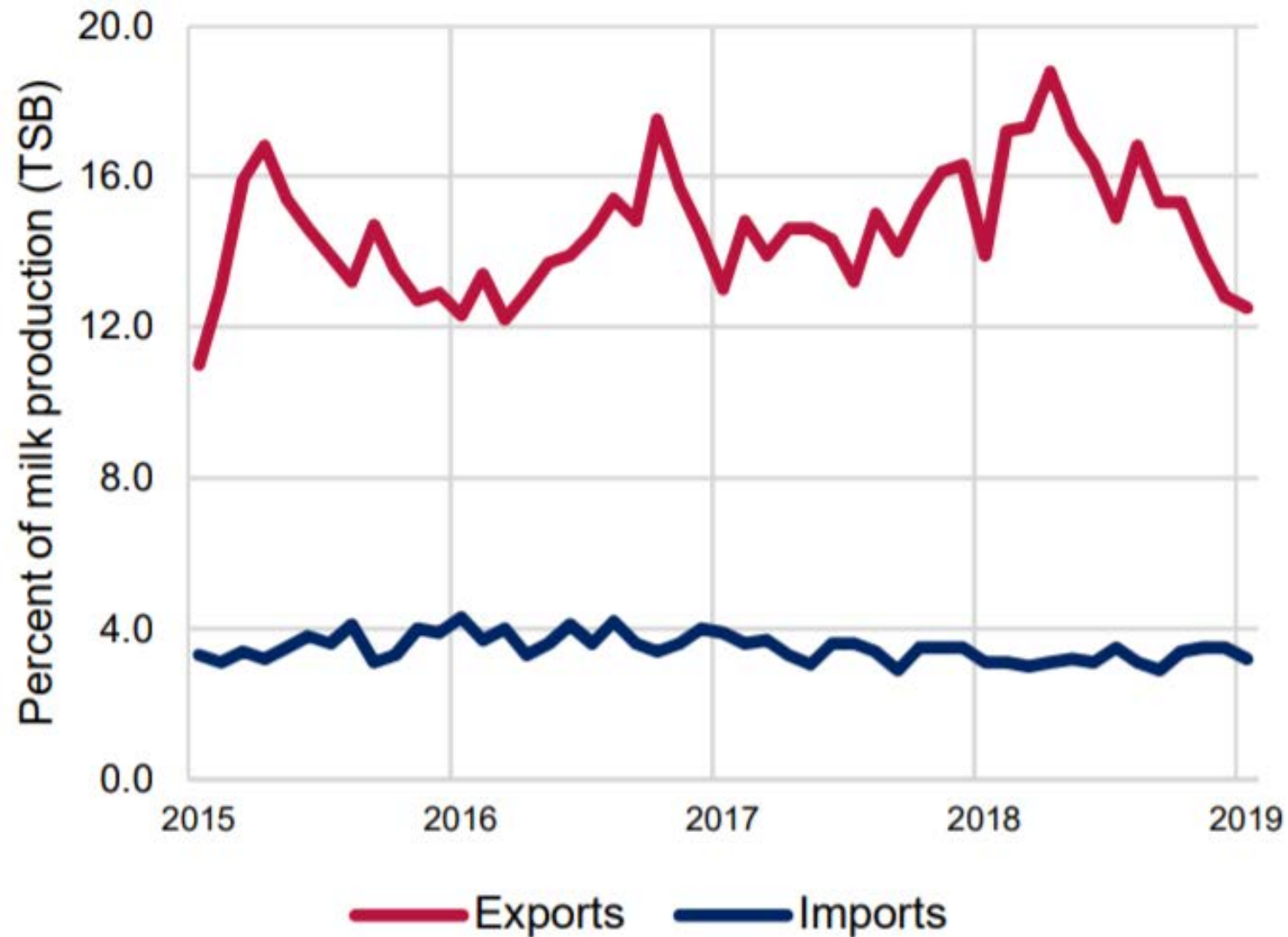
\$1.4 
BILLION

SOLD TO MEXICO,
OUR LARGEST
CUSTOMER

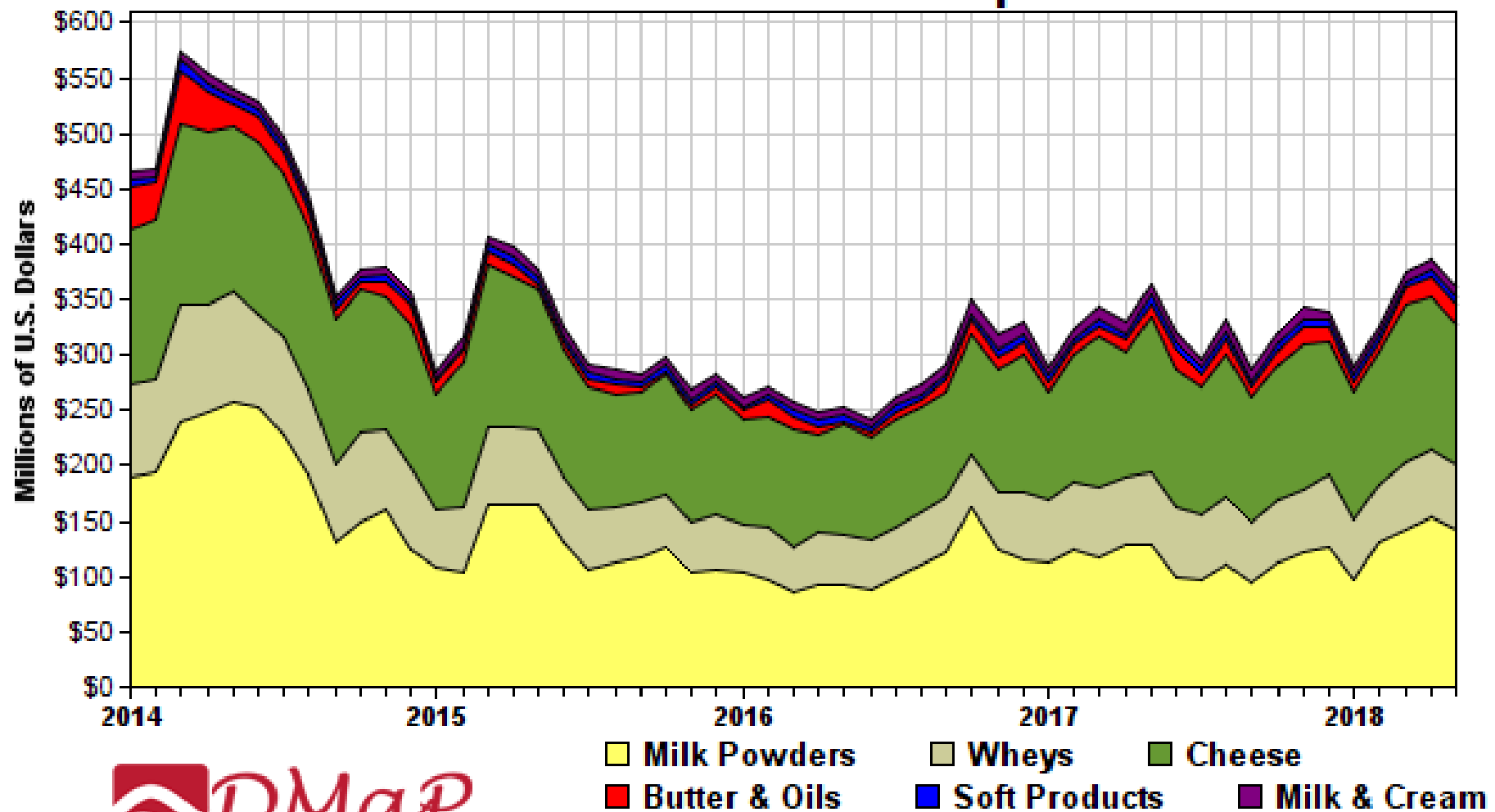
Sources: Year-end 2018 data from U.S. Department of Agriculture, U.S. Department of Commerce, U.S. Dairy Export Council.

Bottom line: Exports expand dairy's economic footprint, creating jobs and tax revenue.

U.S. Exports and Imports as % of Milk Production



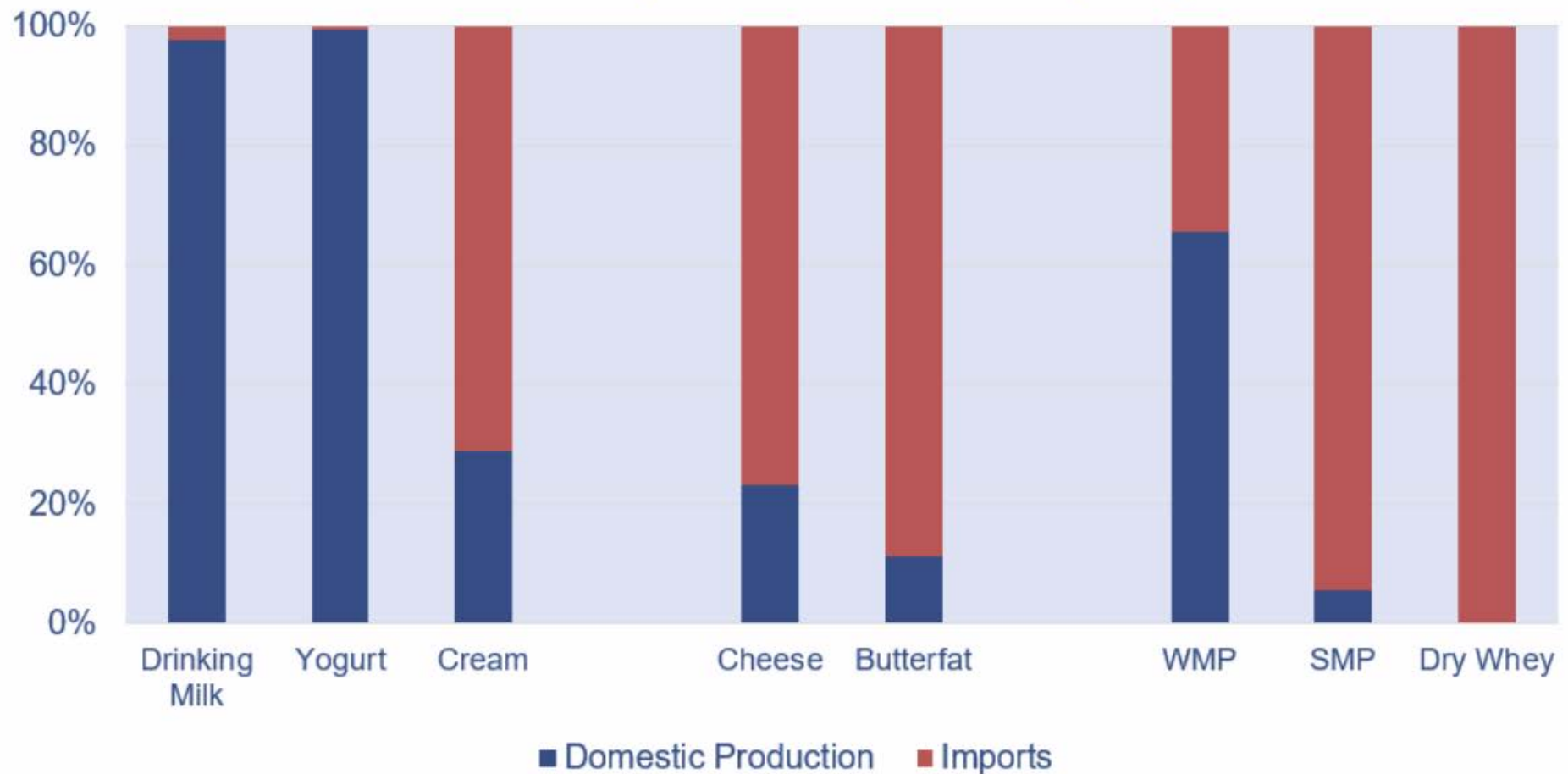
Total Value of U.S. Exports



Dairy Trade Issues

- USMCA – NAFTA 2.0
 - Slightly expanded access to Canada—like TPP
 - WILL NOT go into effect until steel and aluminum tariffs on Canada and Mexico are dropped
- China
 - Swine Flu – how many pigs will be culled? 30-50%?
 - China had almost 50% of world's pigs
 - Decline in soybean, whey and lactose imports
 - -54-72,000 metric tons of lactose-equivalent demand
 - -200 million pounds of whey demand
 - ~\$1/cwt off of Class iii price
 - Higher meat prices worldwide—not enough pigs anywhere to make up that supply shock

China's Dependence on Dairy Imports



Source: USDEC, GIRA



Tariffs as High as 45% Inflict Risk on Chinese Food Companies, Pain on U.S. Dairy Farmers

May 9, 2019

Chinese importers want to mitigate supply-chain risk by adding more U.S. dairy products, but tariffs make that strategy too

U.S. Dairy Exports to China Plummet 43% After New Tariffs

Source: USDEC (volume in metric tons)

Product	July 2017 March 2018 (pre-tariffs)	July 2018-March 2019 (with tariffs)	% change
Whey	204,374	99,767	-51%
Lactose	66,622	60,698	-9%
SMP	21,546	7,183	-67%
Cheese	13,752	7,042	-49%
Other	27,973	15,389	-45%
Total	334,267	190,079	-43%

Competitors Gain Advantages

Preferential Dairy Access – Selected Markets

	U.S.	EU	NZ	Australia
Mexico	◆	◆	◆ *	◆ *
Canada	◆	◆	◆ *	◆ *
China			◆	◆
South Korea	◆	◆	◆	◆
Japan	◆	◆	◆ *	◆ ◆ *
Indonesia		◆	◆	◆
Malaysia		◆	◆	◆
Vietnam		◆	◆ *	◆ *
Thailand			◆	◆
Mercosur		◆	◆	◆
Chile	◆		◆	◆
Colombia	◆	◆		

◆ Concluded FTA
(implemented or
pending near-term
implementation)

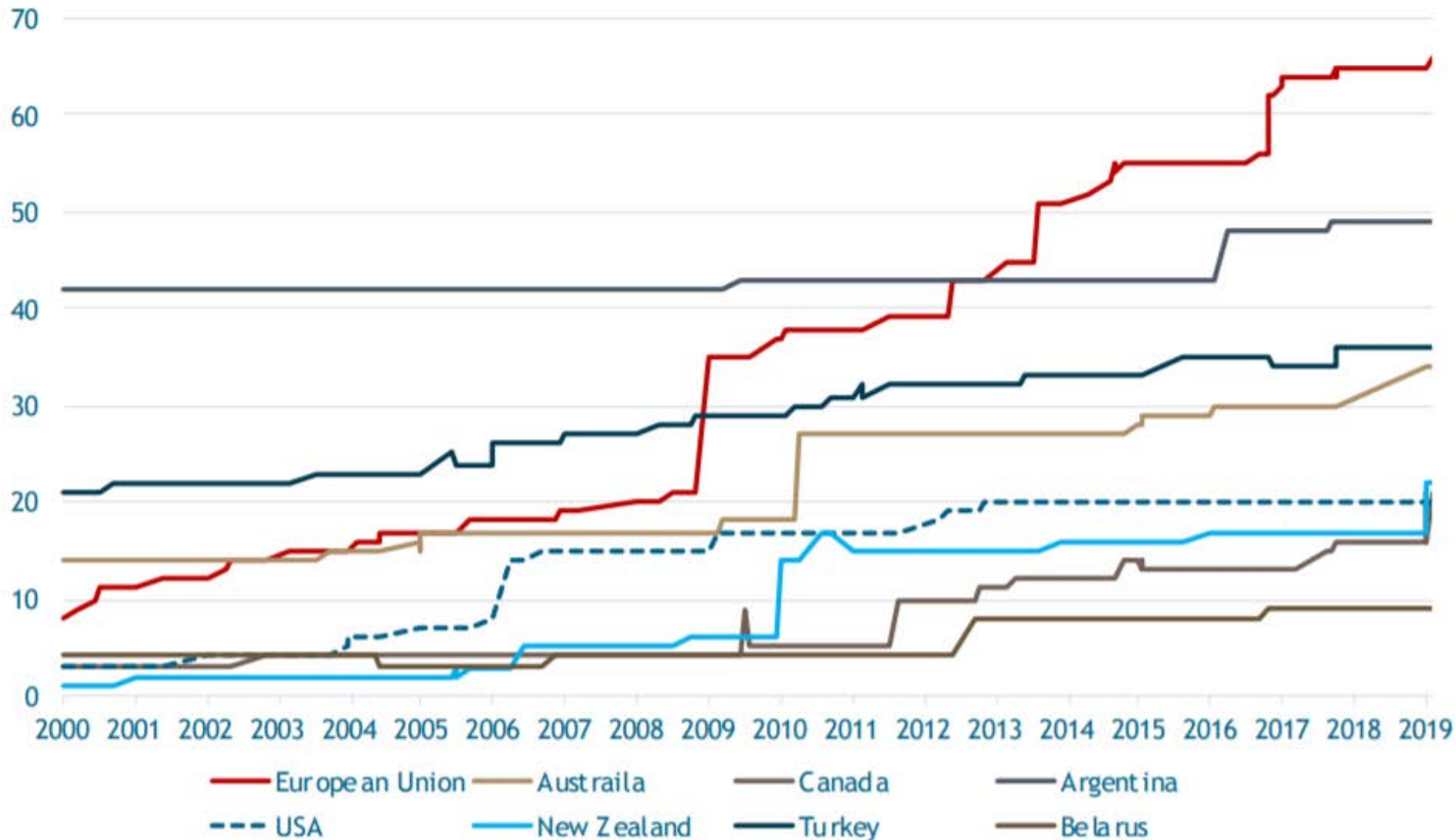
◆ Negotiating FTA,
with potential dairy
access

◆ Re-negotiating FTA

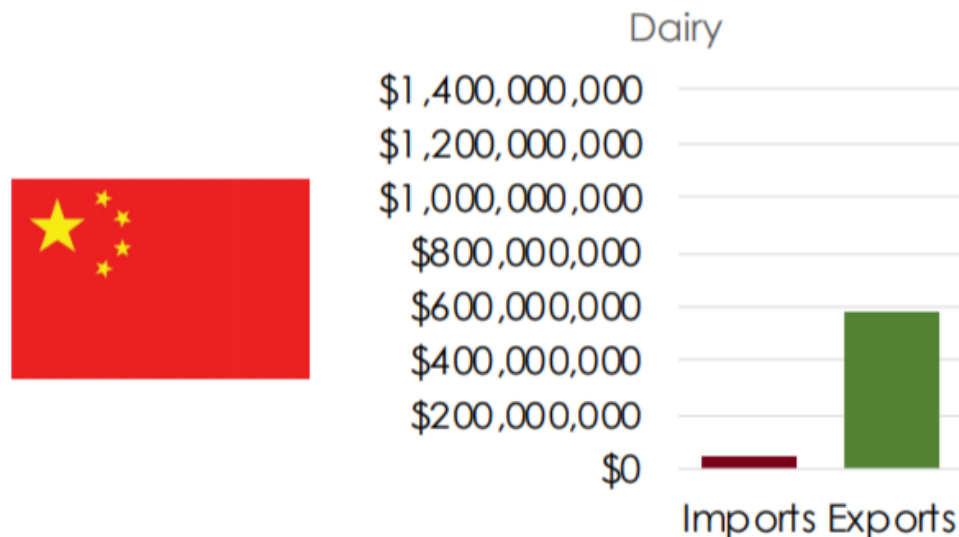
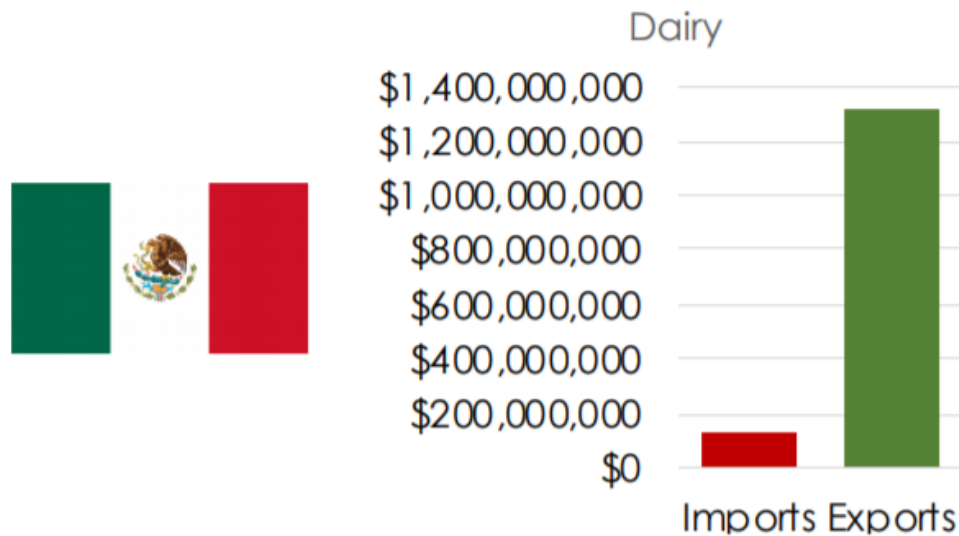
* - Negotiations via TPP

Source: Al Levitt. USDEC

Number of Trade Agreements

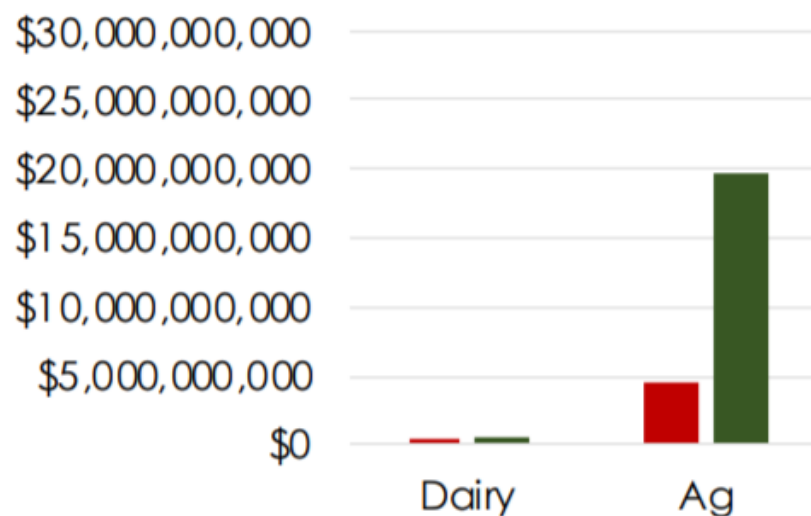
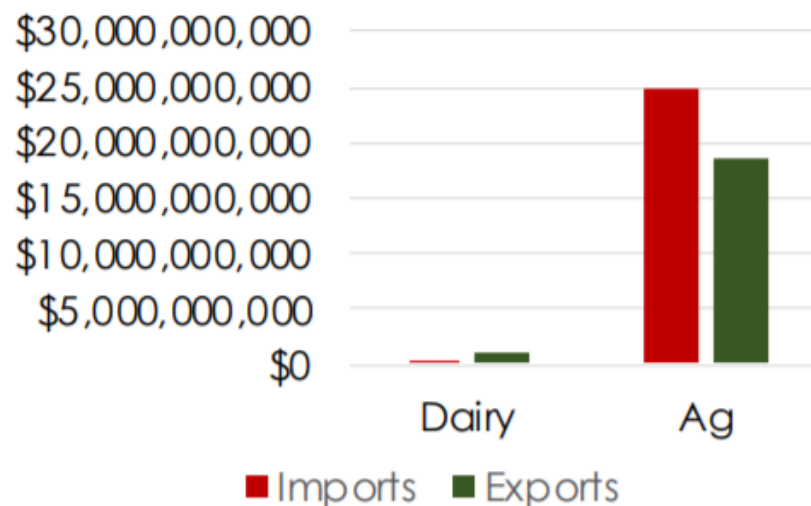


U.S. Exports to Mexico and China



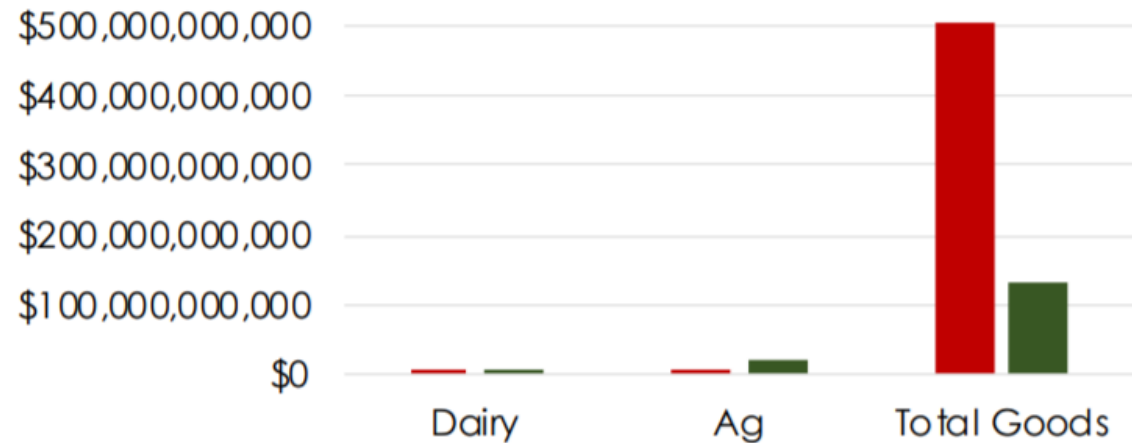
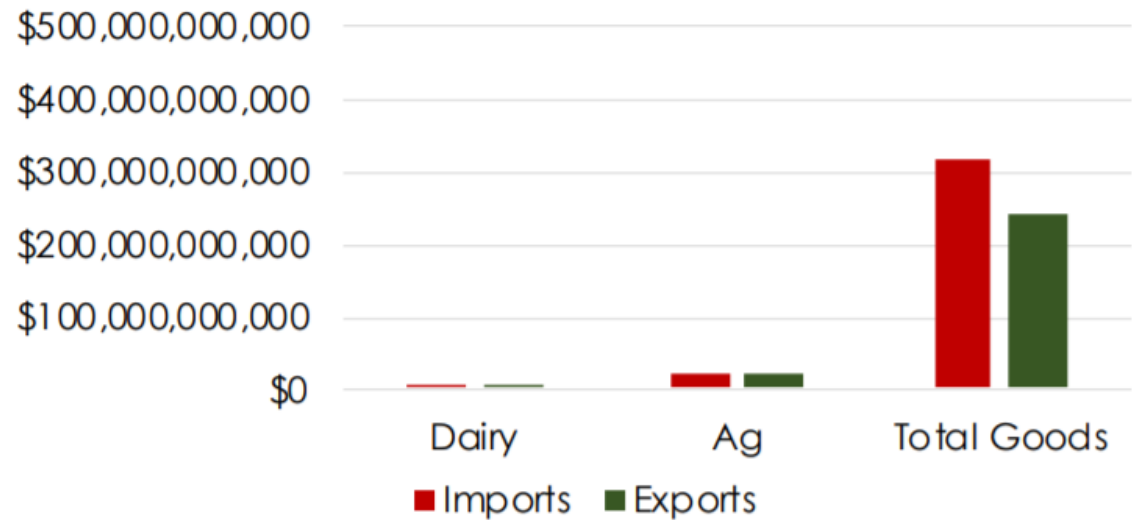
Source: Marin Bozic, UMN

U.S. Exports to Mexico and China



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U.S. Exports to Mexico and China



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Dairy Farm Risk Management Programs and Policies in 2019

- Dairy Margin Coverage: government program that allows protection of US milk price less feed cost using US averages at fixed premiums
- LGM-Dairy: insurance program that that protects class III milk price less feed costs using futures and options prices
- Dairy Revenue Protection (Dairy RP): new insurance program that is an Asian basket of milk put options using CIII or CIV or components

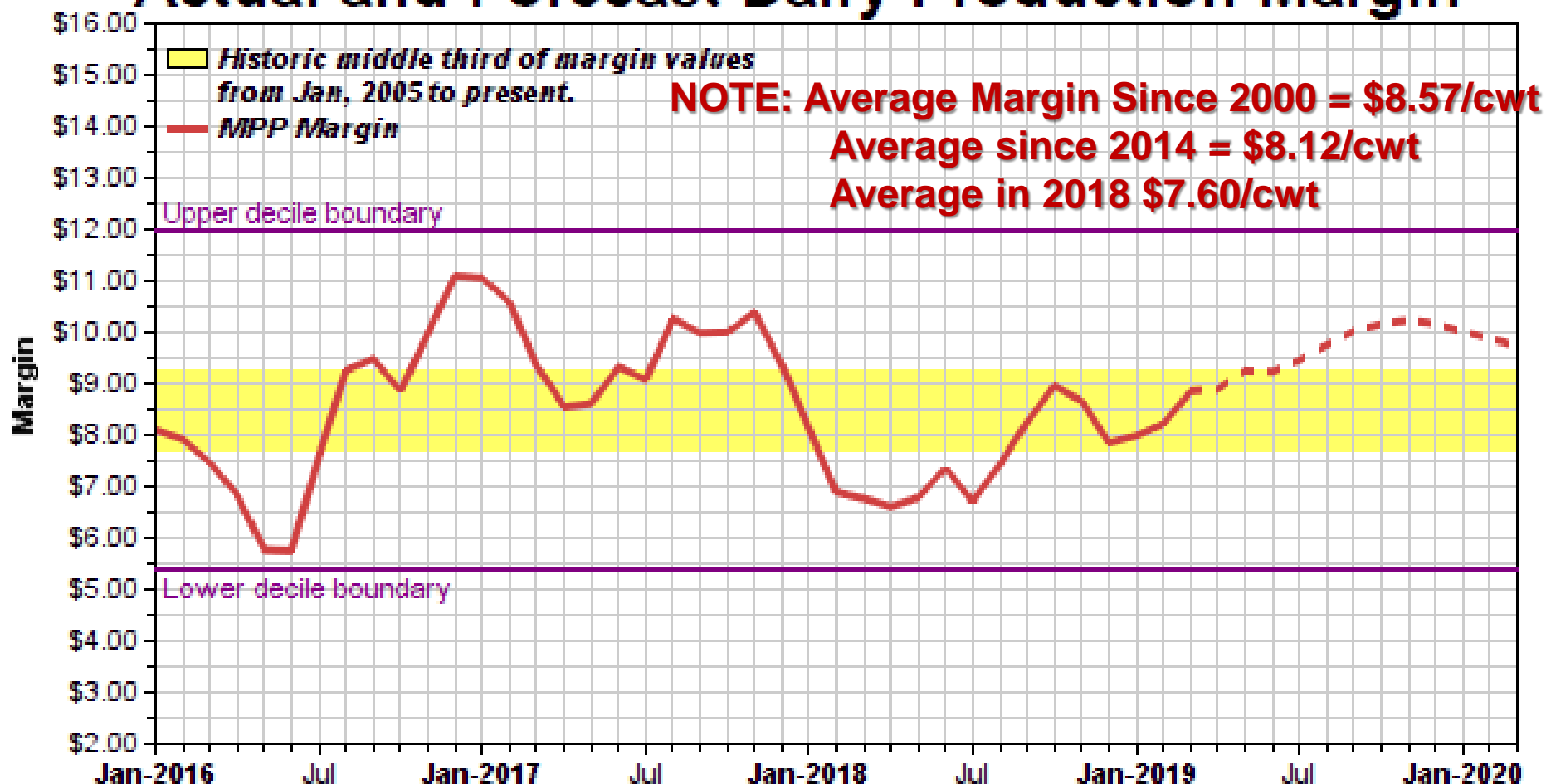
2018 Farm Bill Dairy Subtitle

- MPP changed to Dairy Margin Coverage Program
 - Higher coverage levels and lower premiums for Tier I
 - 5-year sign-up discount
- Dairy farms can participate in both DMC and LGM (or Dairy RP)
 - Those denied MPP in 2018 can retroactively collect net payments
- Repayment of past MPP premiums available
- Class I mover average of CIII + CIV + \$0.74/cwt
- Repeals Dairy Product Donation Program and establishes fluid milk donation program

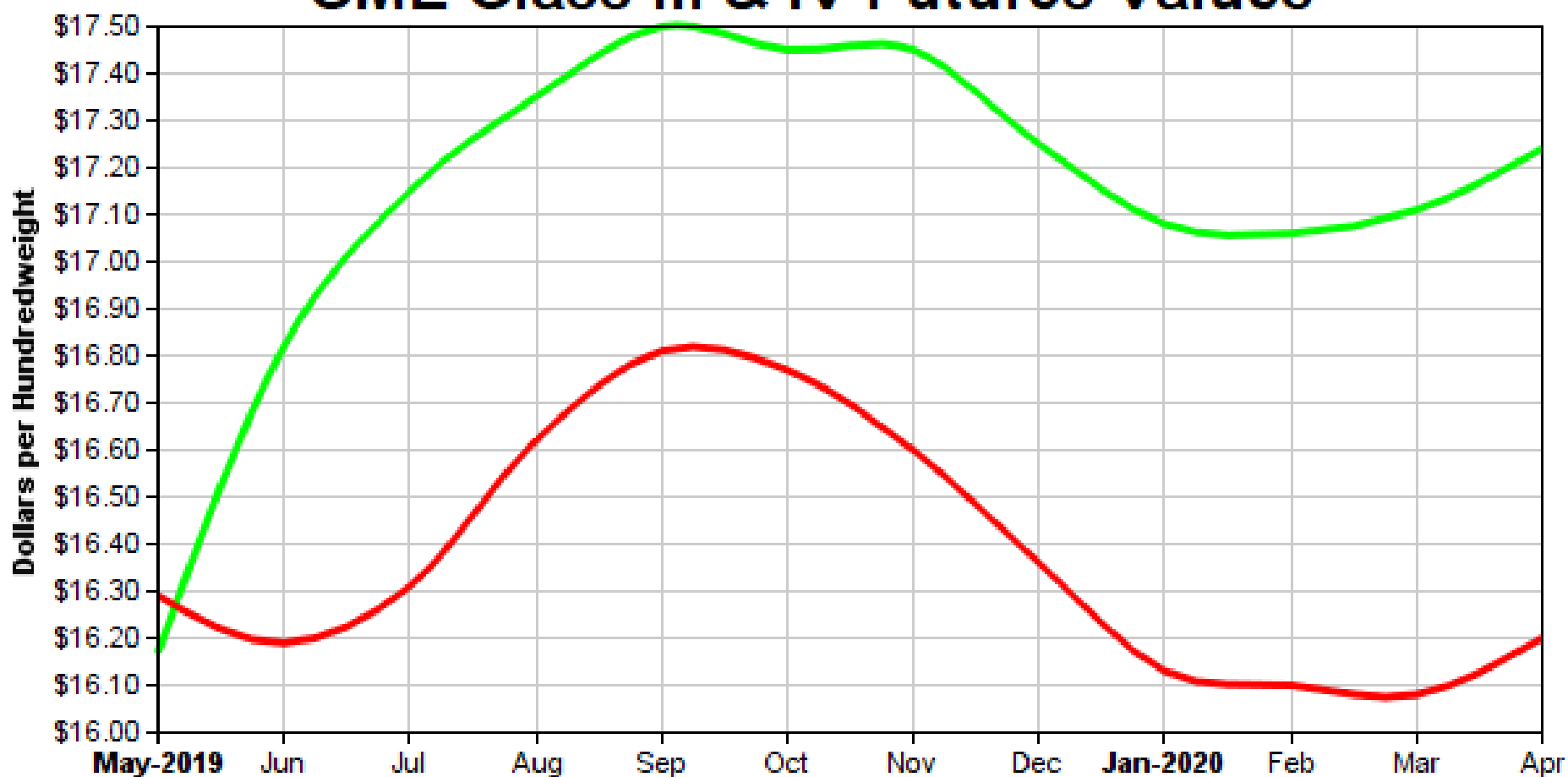
DMC Premium Rates

Margin Covered	Tier I	Tier II		Discounted Tier I
4.00	--	\$/cwt		--
4.50	0.0025	0.0025		0.0019
5.00	0.0050	0.0050		0.0038
5.50	0.0300	0.1000		0.0225
6.00	0.0500	0.3100		0.0375
6.50	0.0700	0.6500		0.0525
7.00	0.0800	1.1070		0.0600
7.50	0.0900	1.4130		0.0675
8.00	0.1000	1.8130		0.0750
8.50	0.1050	--		0.0788
9.00	0.1100	--		0.0825
9.50	0.1500	--		0.1125

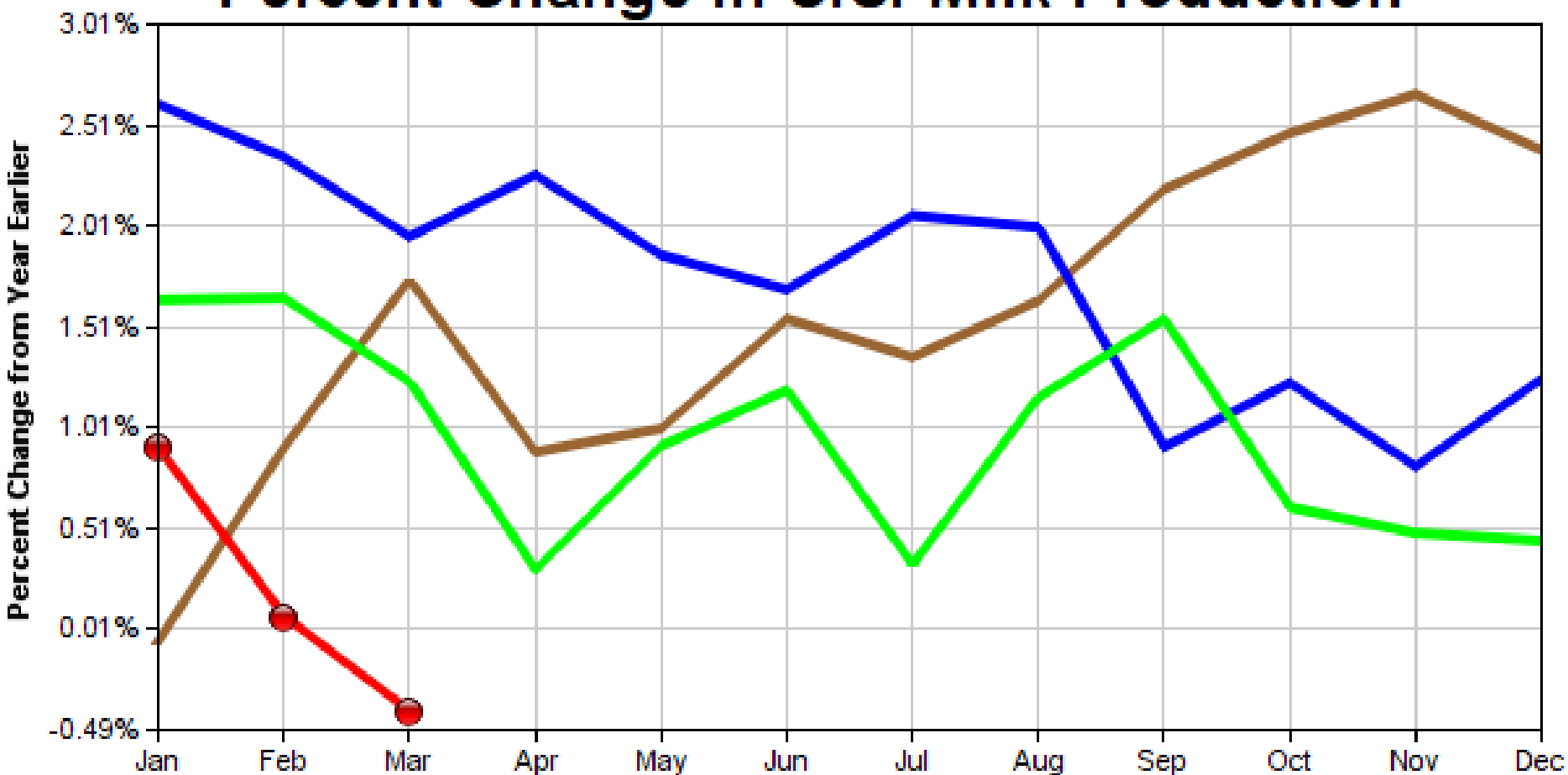
Actual and Forecast Dairy Production Margin



CME Class III & IV Futures Values

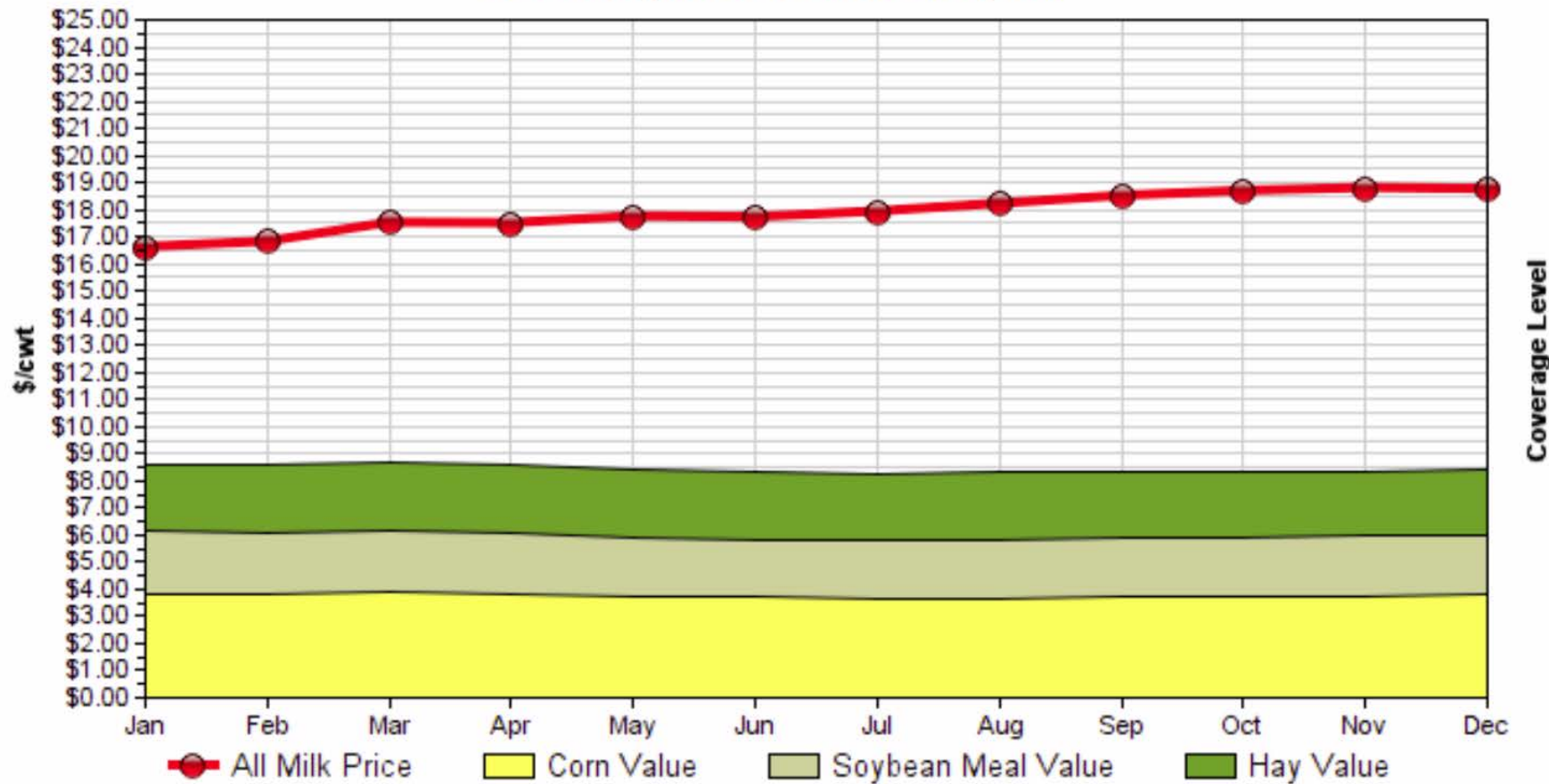


Percent Change in U.S. Milk Production



Average Margin \$9.36/cwt as of May 14, 2019

2019 Margin Protection Program



All Milk Price:	16.60	16.80	17.50	17.48	17.73	17.70	17.91	18.20	18.49	18.67	18.78	18.74
NASS Hay Price:	181	180	184	183	183	181	180	179	178	178	177	177
AMS SBM Price:	315	307	306	304	296	292	293	294	296	298	300	301
NASS Corn Price:	3.56	3.60	3.61	3.56	3.50	3.45	3.42	3.43	3.44	3.47	3.49	3.52
Ration Value:	8.61	8.58	8.64	8.56	8.44	8.33	8.29	8.29	8.30	8.35	8.37	8.41
Margin:	7.99	8.22	8.86	8.92	9.29	9.37	9.62	9.91	10.19	10.32	10.41	10.33

Farm Decisions

- Whether to participate for 2019 (retroactive to January; sign-up June 17)
- Whether to sign up for 5-years (2019-2023) to receive discounted premiums
- If participating, margin level and percentage of production history to cover

** As of May 13, 2019

2019		\$/cwt			Gross	\$9.50	Net Payment	
DMC	All Milk	Feed	Margin		Payment	margin	\$0.15prem	\$0.1125prem
Jan	16.60	8.61	7.99		1.51		1.36	1.40
Feb	16.80	8.58	8.22		1.28		1.13	1.17
Mar	17.50	8.65	8.85		0.65		0.50	0.54
Apr	17.48	8.58	8.90		0.60		0.45	0.49
May	17.80	8.49	9.31		0.19		0.04	0.08
Jun	17.86	8.49	9.37		0.13		-0.02	0.02
Jul	18.06	8.48	9.58		0.00		-0.15	-0.11
Aug	18.38	8.48	9.90		0.00		-0.15	-0.11
Sep	18.64	8.52	10.12		0.00		-0.15	-0.11
Oct	18.82	8.53	10.29		0.00		-0.15	-0.11
Nov	18.94	8.57	10.37		0.00		-0.15	-0.11
Dec	18.89	8.59	10.30		0.00		-0.15	-0.11
Average	17.98	8.55	9.43		0.36		0.21	0.25

2019 Projected Annual Payment**

Coverage Level	Tier 1			
	Price	Premium	Expected Payment	Probability*
\$9.50	<input type="radio"/> \$0.1500	\$7,500.00	\$19,250.00	100%
\$9.00	<input type="radio"/> \$0.1100	\$5,500.00	\$8,541.67	100%
\$8.50	<input type="radio"/> \$0.1050	\$5,250.00	\$3,291.67	11%
\$8.00	<input type="radio"/> \$0.1000	\$5,000.00	\$41.67	1%
\$7.50	<input type="radio"/> \$0.0900	\$4,500.00	\$0.00	0%
\$7.00	<input type="radio"/> \$0.0800	\$4,000.00	\$0.00	0%
\$6.50	<input type="radio"/> \$0.0700	\$3,500.00	\$0.00	0%
\$6.00	<input type="radio"/> \$0.0500	\$2,500.00	\$0.00	0%
\$5.50	<input type="radio"/> \$0.0300	\$1,500.00	\$0.00	0%
\$5.00	<input type="radio"/> \$0.0050	\$250.00	\$0.00	0%
\$4.50	<input type="radio"/> \$0.0025	\$125.00	\$0.00	0%
\$4.00	<input checked="" type="radio"/> \$0.0000	\$0.00	\$0.00	0%

**** As of
May 14,
2019**

*Probability of net benefit (indemnities minus undiscounted premiums) in the 2019

Nets to ~\$13,500 with discount and ~\$11,625 without discount

Table 1. Estimated impact, DMC Payments on Milk Production Profit, \$9.50/cwt. Margin, US, 2014-18

	50 or fewer cows	50- 99 cows	100 - 199 cows	200- 499 cows	500- 999 cows	1000 or more cows
average profit over total cost, 2014-17	-\$15.80	-\$9.03	-\$4.37	-\$1.65	\$1.41	\$2.74
DMC payment / cwt. produced, 2014-2018	\$0.79	\$0.79	\$0.79	\$0.67	\$0.26	\$0.08
percent change in average profit, 2014-2017	5.0%	8.7%	18.0%	40.6%	18.4%	2.9%

- DMC will disproportionately help smaller herds
- Intention is that larger herds can utilize Dairy RP, LGM-Dairy and forward, futures and options contracts

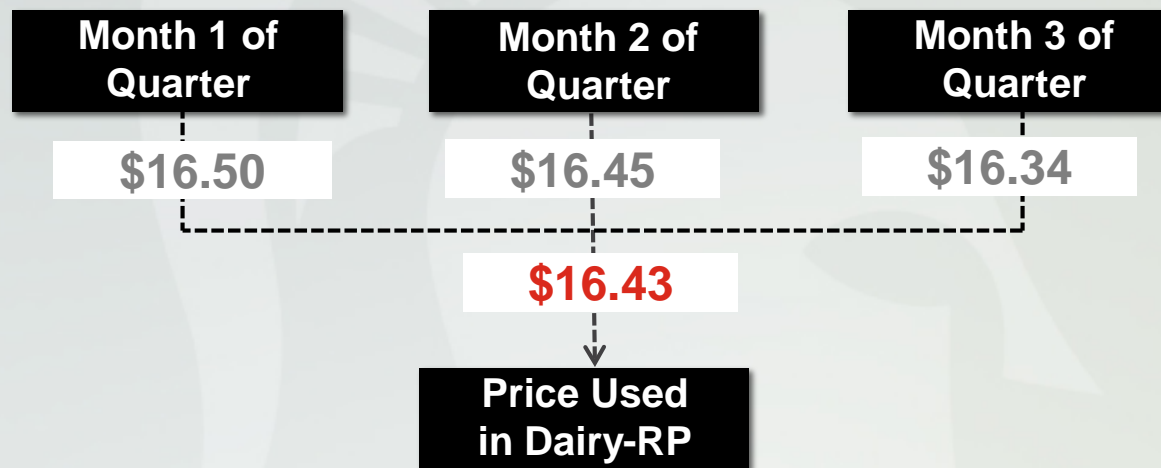
Dairy RP Overview

- Dairy Revenue Protection (Dairy-RP) provides protection against an unexpected decline in revenue (price and/or yield) on the milk produced from dairy cows.
- Covers the difference between final revenue guarantee and actual milk revenue during each quarter of the year
- Basket of milk price put options with payment trigger adjusted by yield and protection factors

Trigger price is average across three months



Milk and Dairy Product Futures (CIII, CIV, Butter, Cheese, Dry Whey)



Subsidy and Coverage Levels

Coverage Level	70%	75%	80%	85%	90%	95%
Premium Subsidy	59%	55%	55%	49%	44%	44%

Note: Beginning farmers are eligible for an additional 10% premium subsidy

US Dairy Risk Management Programs

- Smaller Herds
 - DMC will provide more assistance than MPP
- Larger Herds
 - Dairy RP
 - Subsidy means significantly cheaper than using puts through broker
 - Can tailor to class price mix or component pricing to account for some basis risk
 - Can get more than a year out to capture mean reverting nature of milk futures

Conclusions

- Poor milk prices hasten structural change at farm level
 - Better days ahead for farms that survive
- Dairy has potential to be collateral damage in trade disputes
- Risk management programs can help farms
 - Historic evidence suggests DMC coverage at \$9.50/cwt pays most of the time (for first 5 million pounds—keep it in Tier I)
 - DMC can complement other risk management activities including LGM-Dairy and Dairy RP