

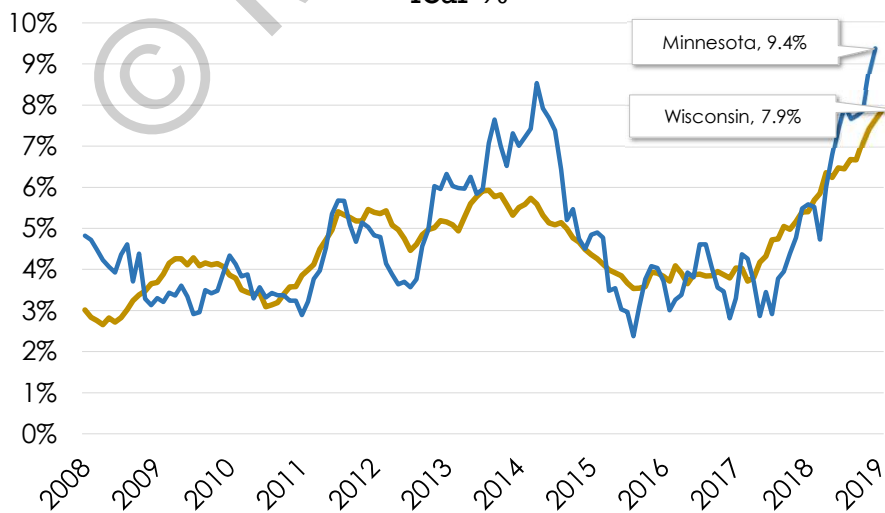
# Overview of Dairy Risk Management Programs

January 9, 2019  
Dr. Marin Bozic

UNIVERSITY OF MINNESOTA  
Driven to Discover<sup>SM</sup>

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### Upper Midwest Dairy Farm Exit Rates, Year-on-Year %



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## 2018 Farm Bill – Highlights for Dairy Producers

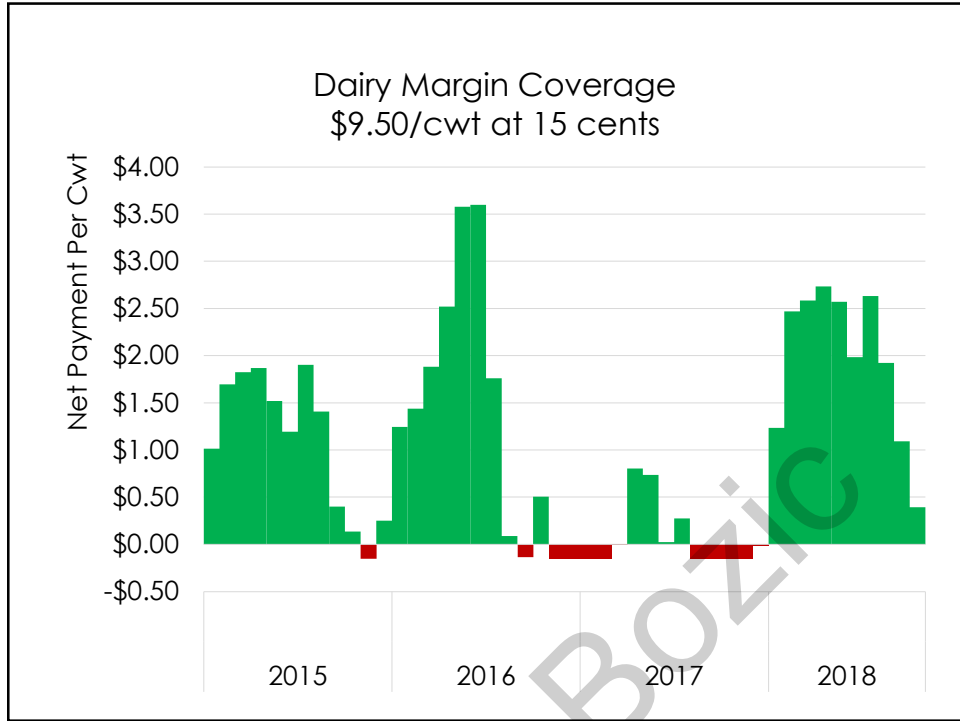
1. Margin Protection Program for Dairy Producers discontinued.
2. Dairy Margin Coverage program introduced.
3. Low premiums and coverage levels up to \$9.50. Discounts for consistent use.
4. Partial rebate of net MPP premiums paid for 2015-2018 period.
5. No more restrictions on combining crop insurance and Title I programs (LGM and DMC)

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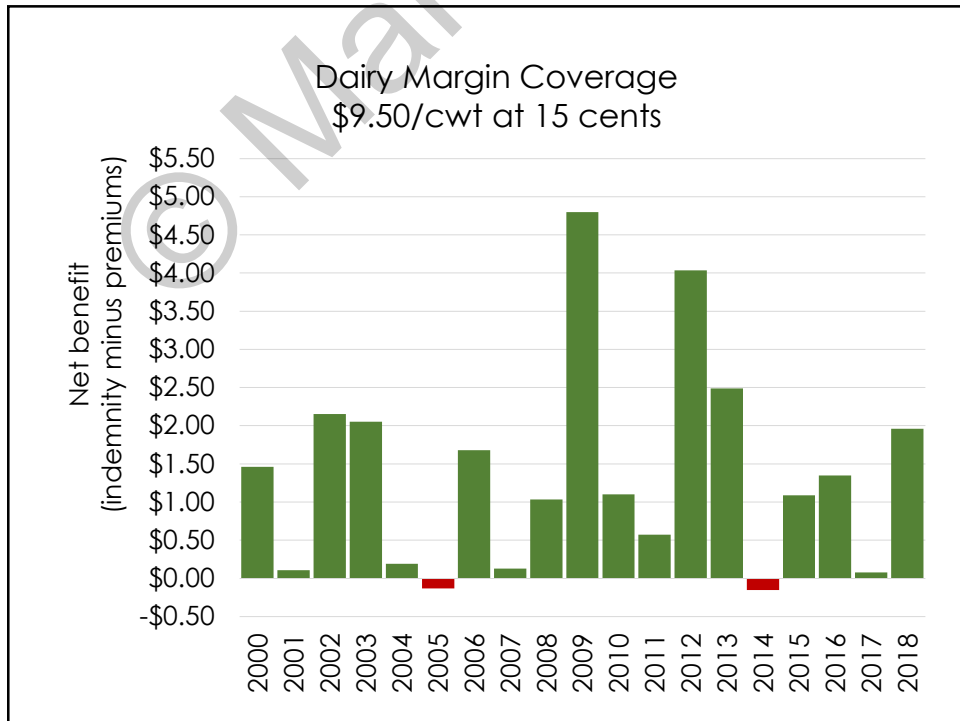
Coverage Level Threshold	Tier 1 MPP-Dairy, 2016 to 2017	Tier 1 MPP-Dairy, 2018	Tier 2 MPP-Dairy	Tier 1 DMC	Tier 2 DMC
Qualifying Production	4 M lbs. or less	5 M lbs. or less	above 5 M lbs.	5 M lbs. or less	above 5 M lbs.
\$4.00	\$-	\$-	\$-	\$-	\$-
\$4.50	\$0.0080	\$-	\$0.0200	\$0.0025	\$0.0025
\$5.00	\$0.0190	\$-	\$0.0400	\$0.0050	\$0.0050
\$5.50	\$0.0300	\$0.0090	\$0.1000	\$0.0300	\$0.1000
\$6.00	\$0.0410	\$0.0160	\$0.1550	\$0.0500	\$0.3100
\$6.50	\$0.0680	\$0.0400	\$0.2900	\$0.0700	\$0.6500
\$7.00	\$0.1630	\$0.0630	\$0.8300	\$0.0800	\$1.1070
\$7.50	\$0.2250	\$0.0870	\$1.0300	\$0.0900	\$1.4130
\$8.00	\$0.4750	\$0.1420	\$1.3600	\$0.1000	\$1.8130
\$8.50	n.a.	n.a.	n.a.	\$0.1050	n.a.
\$9.00	n.a.	n.a.	n.a.	\$0.1100	n.a.
\$9.50	n.a.	n.a.	n.a.	\$0.1500	n.a.

Source: Novakovic & Stephenson (2018), URL:<https://dairymarkets.org/PubPod/Pubs/BP18-02.pdf>

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## What is my milk price floor with Dairy Margin Coverage?

- Forecasted DMC feed ration cost in 2020 is \$8.65
- If choose \$9.50/cwt coverage, that translates to  $\$8.65 + \$9.50 = \$18.15/\text{cwt}$  U.S. all-milk price.
- Since 2015, U.S. all-milk price was on average \$1.50/cwt higher than Class III milk price.
- Therefore, approximate Class III milk price floor with DMC @ \$9.50/cwt is  $\$16.65/\text{cwt}$  ( $\$18.15 - \$1.50 = \$16.65$ ).
- If your estimated basis is \$1.50 over Class III, then with DMC your floor is  $\$18.15/\text{cwt}$  ( $\$16.65 + \$1.50 = \$18.15$ ).
- Deduct 15 cents for premiums, and you have protected price at  $\$18.00/\text{cwt}$ .

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## Rule of thumb for 'OK price'?

- This question puzzles many producers... here's an easier way:
  - 1) What is the total income you need to earn in a year to have a reasonable financial situation? E.g. \$480,000.
  - 2) What is the total income you can generate from sources other than milk sales, e.g. off farm work, cattle sales, etc. E.g. \$50,000.
  - 3) Deduct (2) from (1). E.g. \$430,000.
  - 4) What is the total pounds you will ship next year? E.g. 2,300,000, or 23,000 cwts.
  - 5) Divide (3) by (4): E.g.  $\$430,000 / 23,000 \text{ cwt} = \$18.69/\text{cwt}$ .

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## What if my cost of production is higher than what I can protect with DMC?

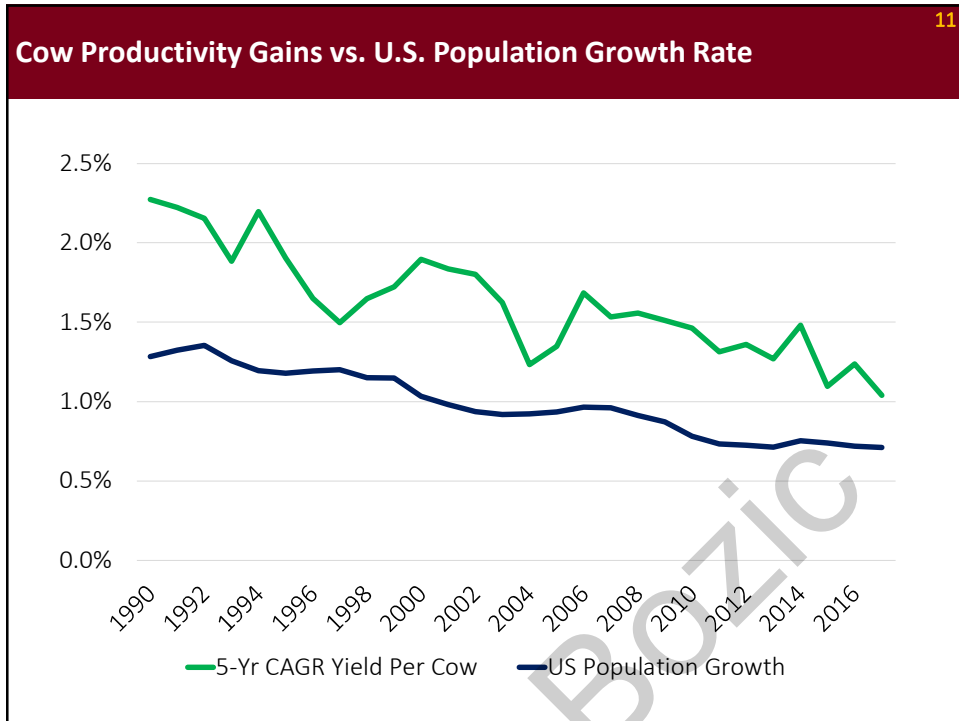
- In our example, the producer has cost of production \$18.69/cwt, but can only protect approx. \$18.00/cwt with DMC.
- Farm Bill allows you to use DMC + Dairy-RP or LGM, on the *same pounds*.
- If you complement DMC with crop insurance for dairy, then for deep enough price drops, combined payouts from DMC + DairyRP (or LGM) will suffice to cover your cost of production.

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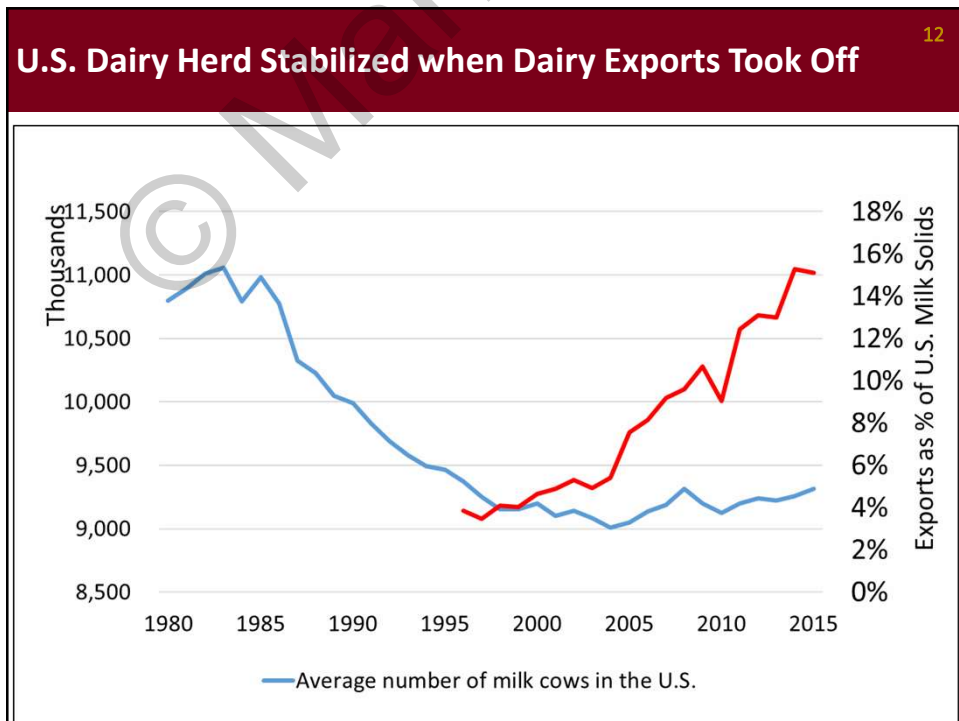
© Marin Bozic

If DMC pays out big time, what will be impact on milk markets?

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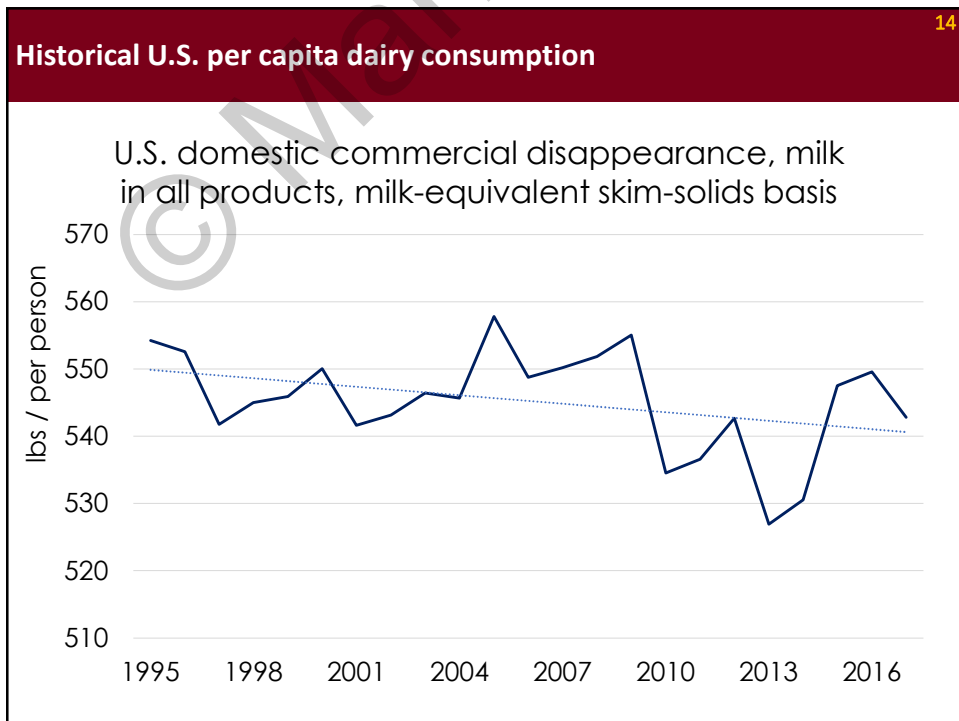
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**Cow Productivity Gains vs. U.S. Population Growth Rate: Implications**

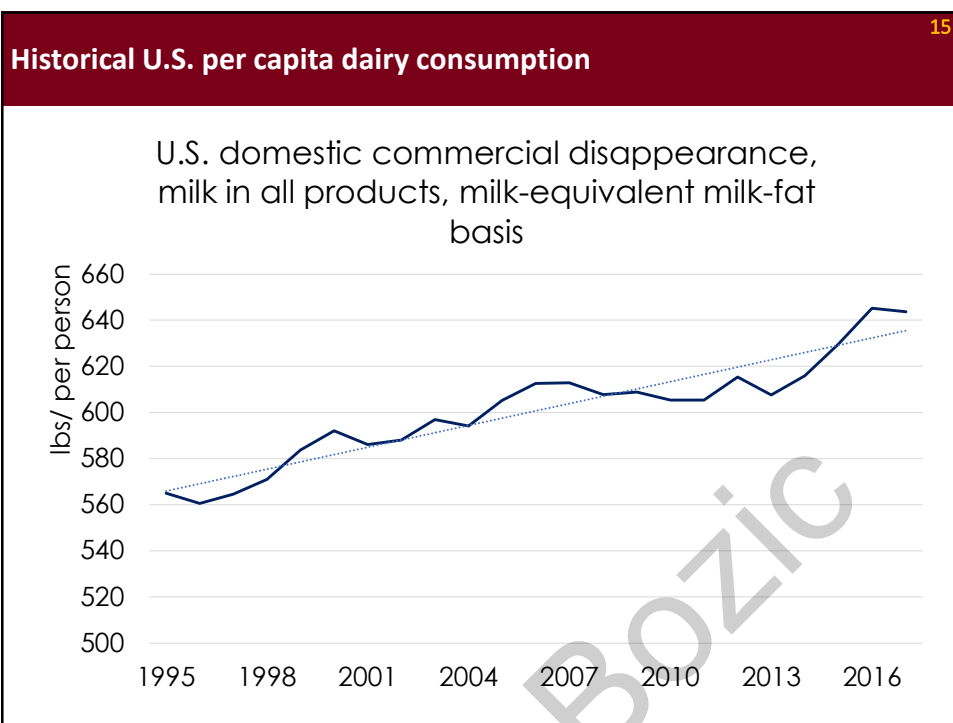
**Supply**  
 Milk pounds growth:  $23,000 \text{ lbs/cow} \times 1\% \times 9,400,000 \text{ cows} = 2.16 \text{ billion lbs}$   
 1.2% yield growth (276 lbs/cow or 0.75 lb/cow/day) → 2.6 billion lbs  
 1.5% yield growth (345 lbs/cow or 0.95 lb/cow/day) → 3.2 billion lbs

**Demand**  
 ???

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### Cow Productivity Gains vs. U.S. Population Growth Rate: Implications

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**Demand**

*Using per capita commercial disappearance, milk in all products, skim-solids basis (no per capita consumption growth)*

542 lbs / per person  $\times$  330 million  $\times$  0.7% → 1.25 bil lbs

560 lbs / per person  $\times$  330 million  $\times$  0.7% → 1.29 bil lbs

*Milk-fat basis*

643 lbs / per person  $\times$  330 million  $\times$  (0.7% + 0.5% per head) → 2.5 bil lbs

643 lbs / per person  $\times$  330 million  $\times$  (0.7% + 1% per head) → 3.6 bil lbs

643 lbs / per person  $\times$  330 million  $\times$  (0.7% + 2% per head) → 4.2 bil lbs

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### Growth of U.S. Exports / US Milk Production Growth

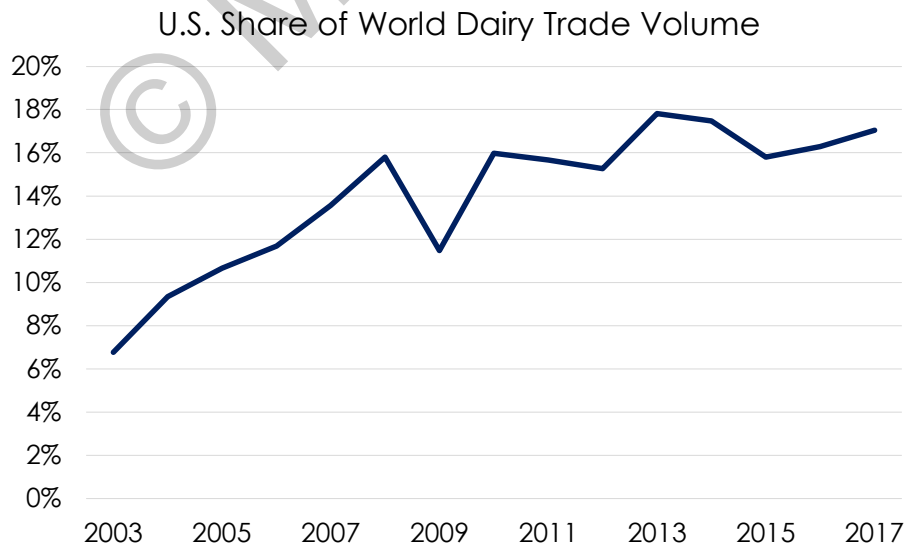
Period	Milk-Fat Basis	Skim-Solids Basis
2007-2017	13%	59%
2007-2014	34%	79%
2014-2017	-31%	18%

In 2017, U.S. exported 'only' cca 18.8% of milk on skim-solids basis or 4.2% on milk-fat basis, but exports have been absorbing most of the *growth* of U.S. milk production over the past decade. In 2015, decline in exports acted as if the U.S. milk production growth was twice as strong as it was – depressing domestic prices.

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### Relying on world trade growth not enough, we would have to increase market share to export enough...



\* USDA projected yield \* 9.4 mil cows; actual USDA export projections

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## If DMC pays out big time, what will be impact on milk markets?

- Many producers which would otherwise have to exit will be able to stay in business.
- My estimate is that in a year like 2018, DMC payouts could be \$800 million - \$1 billion.
- Will that result in more milk on the market? It depends. Where plant capacity is a constraint, coops may not allow some producers to expand, even if they want.
- Some planned new dairies may not be built, anticipating milk oversupply.
- All things considered, more pressure on mid-size and large dairies to balance supply and demand.
- That's why it's important *right now* to put in risk management for 2020 and 2021.

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**Dairy**  
REVENUE PROTECTION

DAIRY REVENUE PROTECTION POLICY

**AFBIS, INC.**  
AMERICAN FARM BUREAU INSURANCE SERVICES, INC.

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## What is protected?

- **Revenue** = Price x Quantity.
- **Which price?**
  - Based on Federal Milk Marketing Order Prices.
  - If you want to keep it very simple, or care about fluid milk impact:
    - Class III
    - Class IV
  - If you want to protect a milk price that reflects *your* milkfat and protein tests
    - Cheese (protein)
    - Butter (milkfat)
    - Dry whey (other solids)
- **Which quantity?**
  - Whatever you declare. We assume that your production risk is correlated with state-level milk per cow risk. (We'll get to that)

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## Premium subsidies

Area-Based Revenue Protection Subsidy Schedule from FCI Act 2014

Coverage Level	Premium Subsidy
90% to 95%	44%
85% to 89%	49%
75% to 84%	55%
70% to 74%	59%
Below 70%	N/A

Premiums are not due until the quarter of coverage is over.  
For example, premiums for Q1 2019 are not due until April 15, 2019.

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## Who, what, when, where and why of DRP

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### What?

“It’s the crop insurance for milk.”

### Where?

Everywhere (in the U.S.)

### When?

(Almost) every working day, from 4pm until 9am the following morning.

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## Who is involved?

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- Developed by:
  - American Farm Bureau Insurance Services, Inc.
  - American Agricultural Insurance Company
  - Country Financial
  - Dr. John Newton / American Farm Bureau Federation
  - Dr. Joshua Woodard / Cornell University & Founder of Ag-Analytics
  - Dr. Marin Bozic / University of Minnesota
- Sold by:
  - Crop Insurance Agents
- Government Agencies:
  - USDA Risk Management Agency
  - Federal Crop Insurance Corporation
  - NOT INVOLVED: Farm Bill; Farm Services Agency (administers MPP-Dairy)

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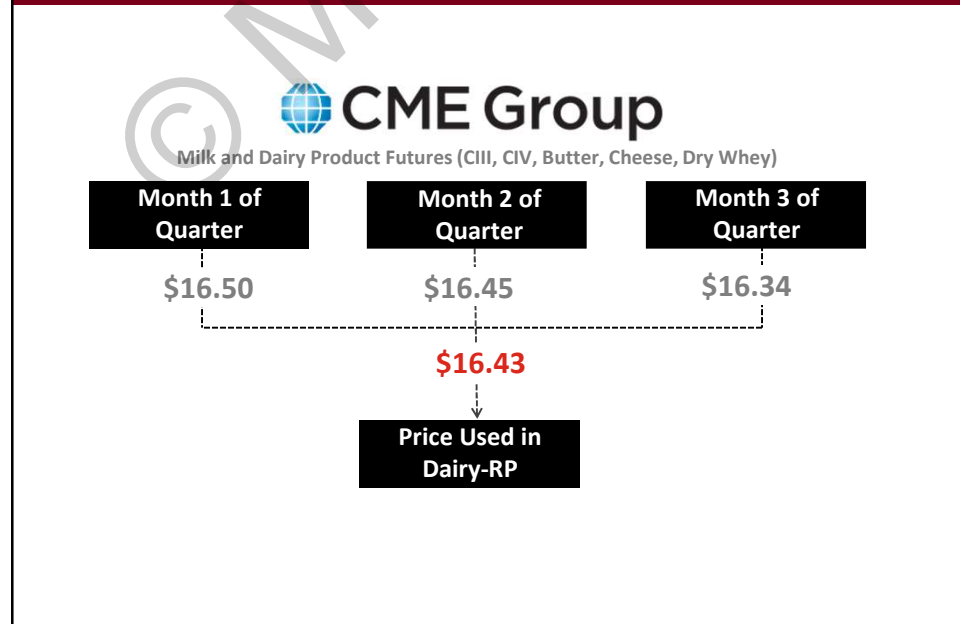
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25

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## How is milk priced? Expected Prices – E.g. Class III Milk, Q4 2019



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## How is milk priced? Butterfat price 27

**USDA** Agricultural Marketing Service  
**Announcement of Class and Component Prices**  
 United States Department of Agriculture  
 Agricultural Marketing Service Dairy Programs Market Information Branch August 1, 2018

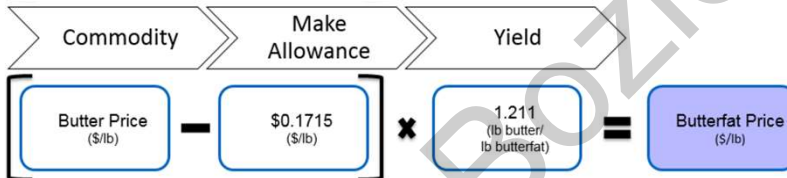
**July 2018 Highlights**  
 Class II Price was \$1.20 per hundredweight for the month of July 2018. The price per hundredweight decreased \$0.28 from the previous month.  
 Class III Price was \$1.10 per hundredweight for the month of July 2018. The price per hundredweight decreased \$1.11 from the previous month.  
 Class IV Price was \$1.14 per hundredweight for the month of July 2018. The price per hundredweight decreased \$1.77 from the previous month.

**Announcement of Class and Component Prices for July 2018**

Class II Price	\$1.20 (per hundredweight)
Class II Butterfat Price	\$1.170 (per pound)
Class II Nonfat Milk Price <sup>1</sup>	\$0.93 (per hundredweight)
Class III Price	\$1.10 (per hundredweight)
Class III Butterfat Price	\$1.04 (per hundredweight)
Class III Nonfat Milk Price	\$0.94 (per hundredweight)
Class IV Price	\$1.14 (per hundredweight)
Class IV Butterfat Price	\$1.04 (per hundredweight)
Class IV Nonfat Milk Price	\$0.94 (per hundredweight)
Butterfat Price	\$2.5287 (per pound)
Nonfat Solids Price	\$0.6085 (per pound)
Protein Price	\$1.4827 (per pound)
Other Solids Price	\$0.1422 (per pound)
Somatic Cell Adjustment Rate	0.00074 (per 1,000 somatic cells)
Product Price Averages:	
Butter	\$2.2596 (per pound)
Nonfat Dry Milk	\$0.7824 (per pound)

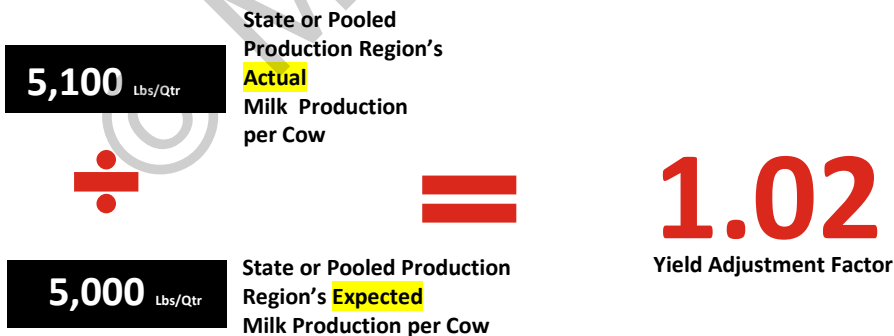
July 2018 Advanced Price Announcement

Butterfat Price:	\$2.5287 (per pound)
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Nonfat Dry Milk	\$0.7824 (per pound)



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## Production Risk 28



Yield Adjustment Factor will move the Actual Milk Revenue up/down based on Actual Milk Yields in the State or Pooled Production Region relative to the Expected Milk Yields.

**Yield Adjustment Factors below 1.00 will INCREASE Indemnities.**  
**Yield Adjustment Factors above 1.00 will DECREASE Indemnities.**

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**Premium subsidies**

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Area-Based Revenue Protection Subsidy Schedule from FCI Act 2014

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**Dairy Revenue Protection - Availability**

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Quarterly Insurance Period 801 - 808	Sales Available				Sales Not Available			
	2018	2019	2019	2019	2019	2020	2020	2020
Sales Dates	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep
July 1 – Sep 15	801	802	803	804	805	806	807	808
Sep 16 – Dec 15	801	802	803	804	805	806	807	808
Dec 16 – Mar 15	801	802	803	804	805	806	807	808
Mar 16 – June 15	801	802	803	804	805	806	807	808
June 16 – June 30	801	802	803	804	805	806	807	808

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## Your Choices

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- Choose quarter
- Declared butterfat test
- Declared protein test
- Declared class price weighting factor
- Declared covered milk production
- Coverage Level
- Protection factor

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## What if...

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### **Q: What if you produce less than declared production?**

A: If you have produced at least 85% of declared, you're good. If you produced less than 85% of what you declared, your guaranteed revenue is based on your realized production divided by 0.85.

### **Q: What if your butterfat and/or protein is lower than declared?**

A: If you are within 90% of declared, you're good. If you produced less than 90% of what you declared, your guaranteed revenue is reduced.

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## A Simple Dairy Hedging Example

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- Buy puts consistently, do not try to guess what the price will do next
- Never spend more than 50 cents on a put

Let us evaluate three strategies:

- 1) Always buy puts for milk produced **THREE months** from now  
E.g. in January 2013 hedge April milk, in February hedge May milk, etc.
- 2) Always buy puts for milk produced **SEVEN months** from now  
E.g. in January 2013 hedge August milk, in February hedge September milk, etc.
- 3) Always buy puts for milk produced **ELEVEN months** from now  
E.g. in January 2013 hedge November milk, in February hedge December milk, etc.

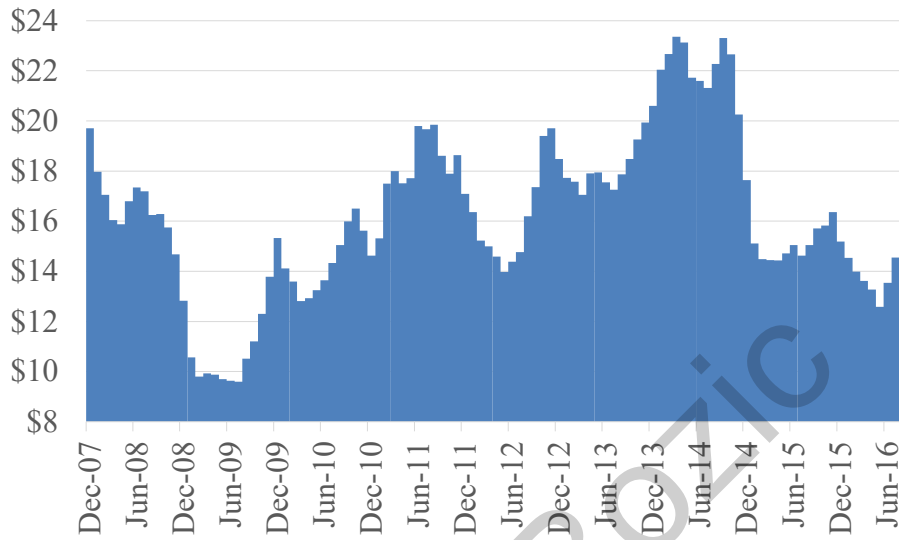
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## What can you afford for 50 cents?

Hedging Horizon	Option Strike
1 month	3 cents below futures
3 months	60 cents below futures
5 months	\$1.02 below futures
7 months	\$1.36 below futures
9 months	\$1.64 below futures
11 months	\$1.93 below futures

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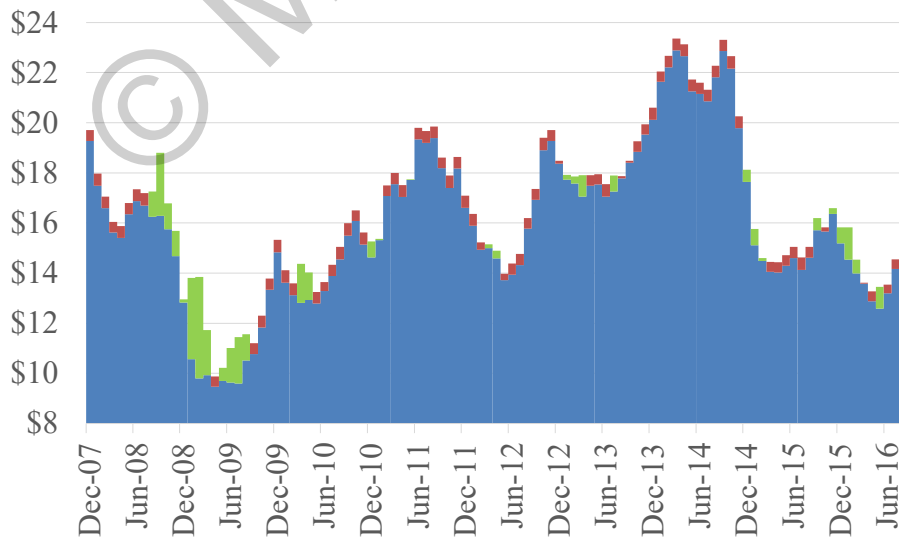
### How do we know if the risk management is successful?



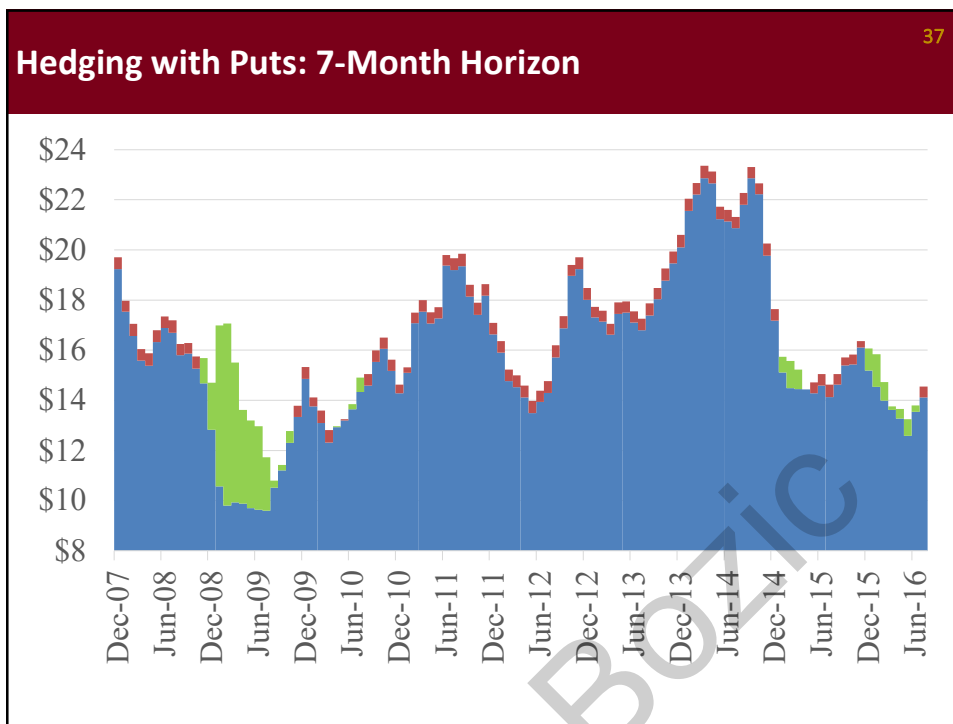
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### Hedging with Puts: 3-Month Horizon

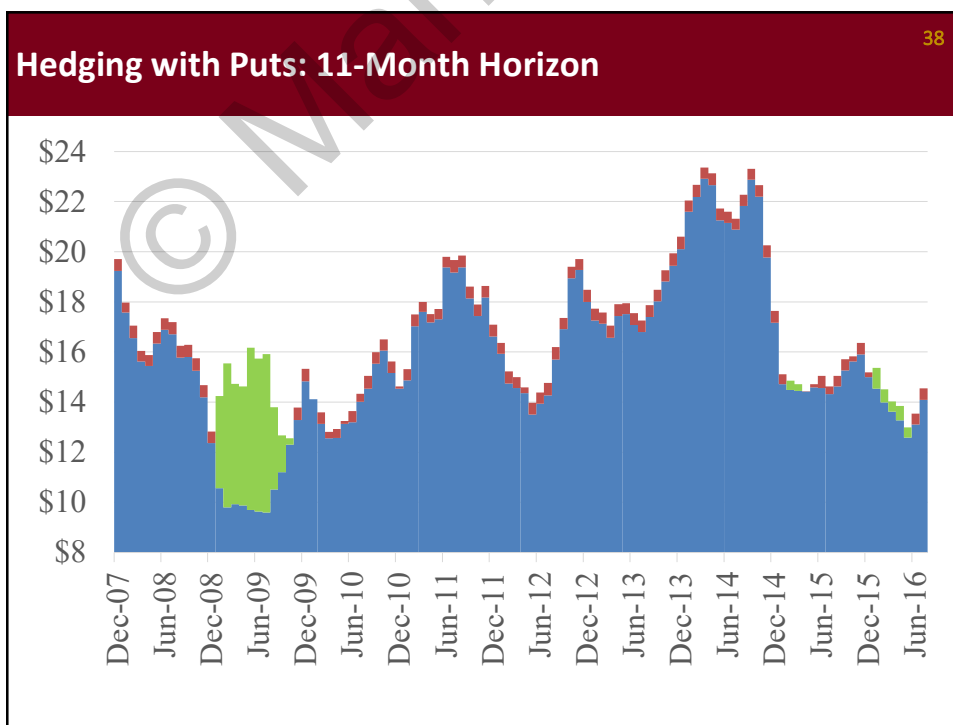
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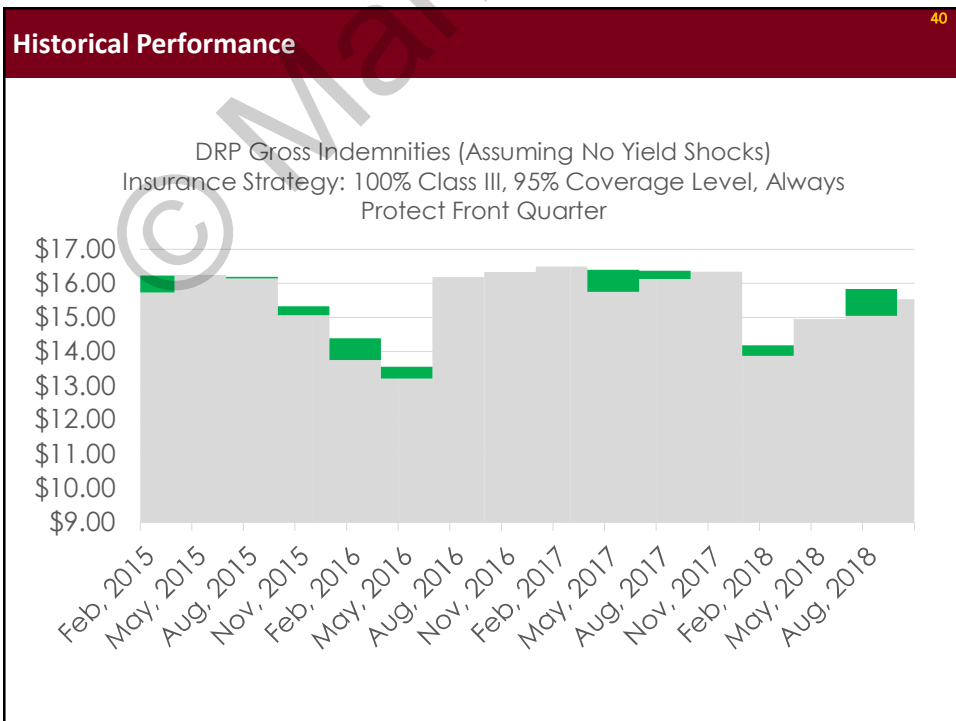
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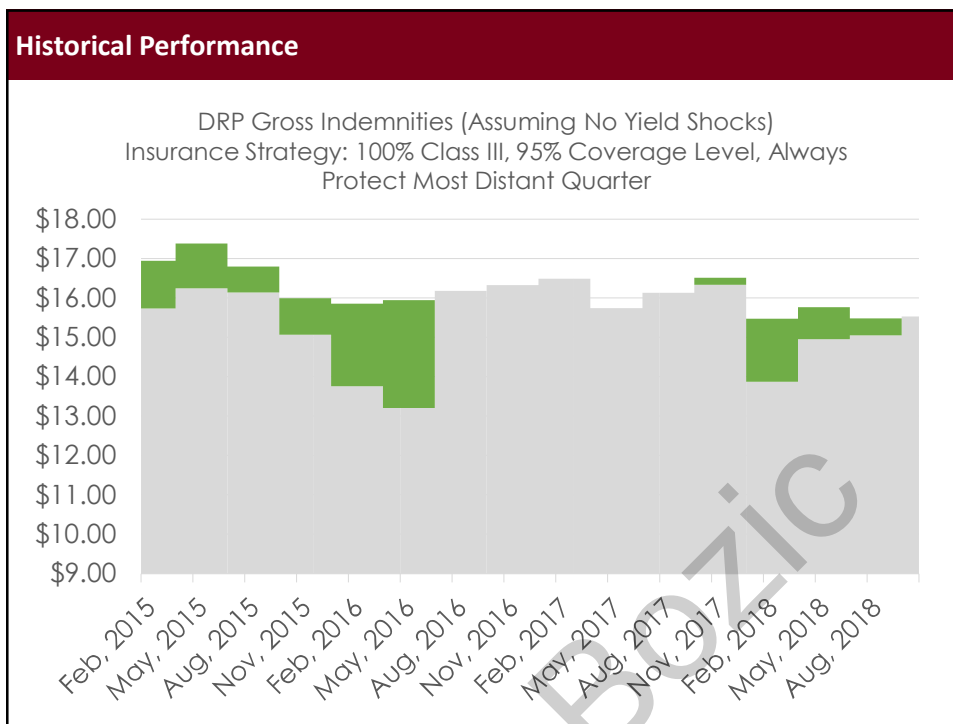
### A Simple Hedging Program with Puts

Hedging Horizon	Number of Profitable Trades	Net Profit/Loss 2007-2016
1 month	28/104	-\$0.13
3 months	32/104	\$0.04
5 months	30/104	\$0.01
7 months	25/104	\$0.02
9 months	18/104	\$0.02
11 months	17/104	\$0.03

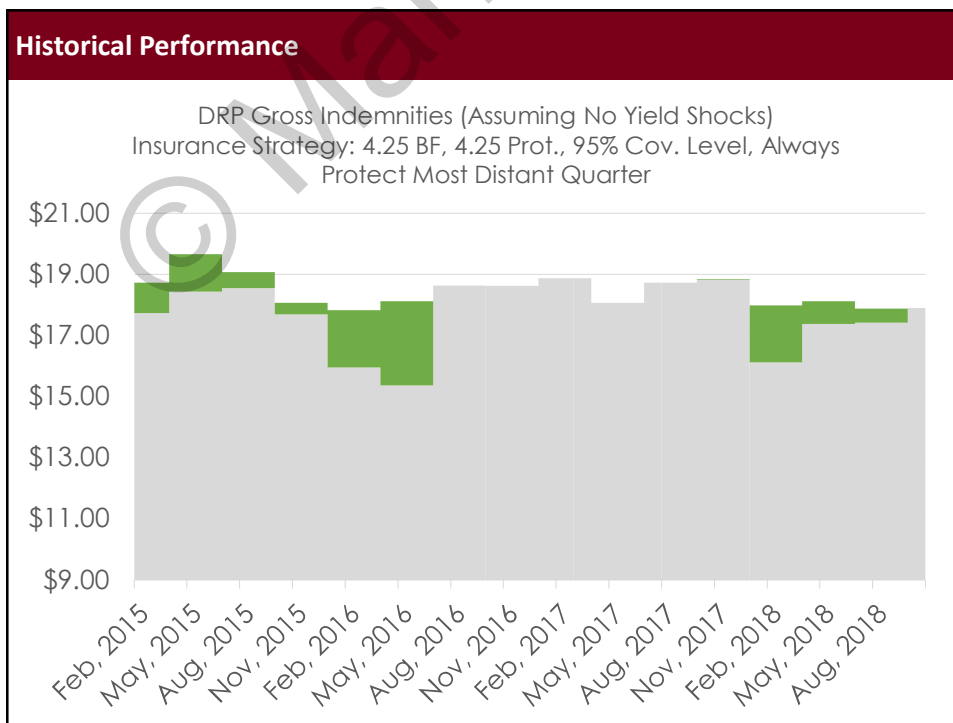
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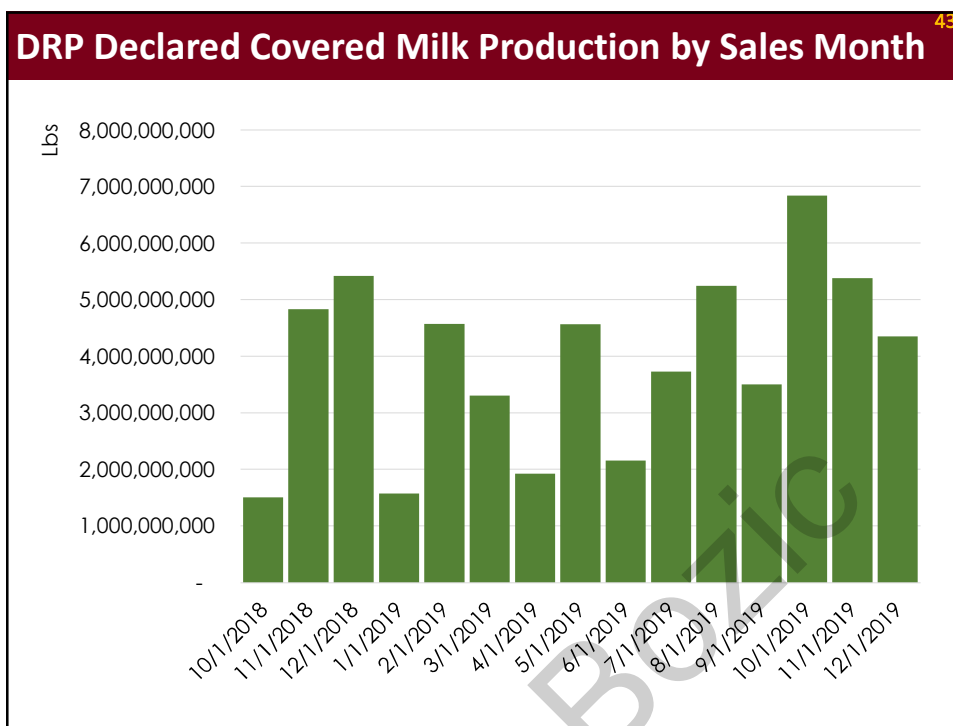
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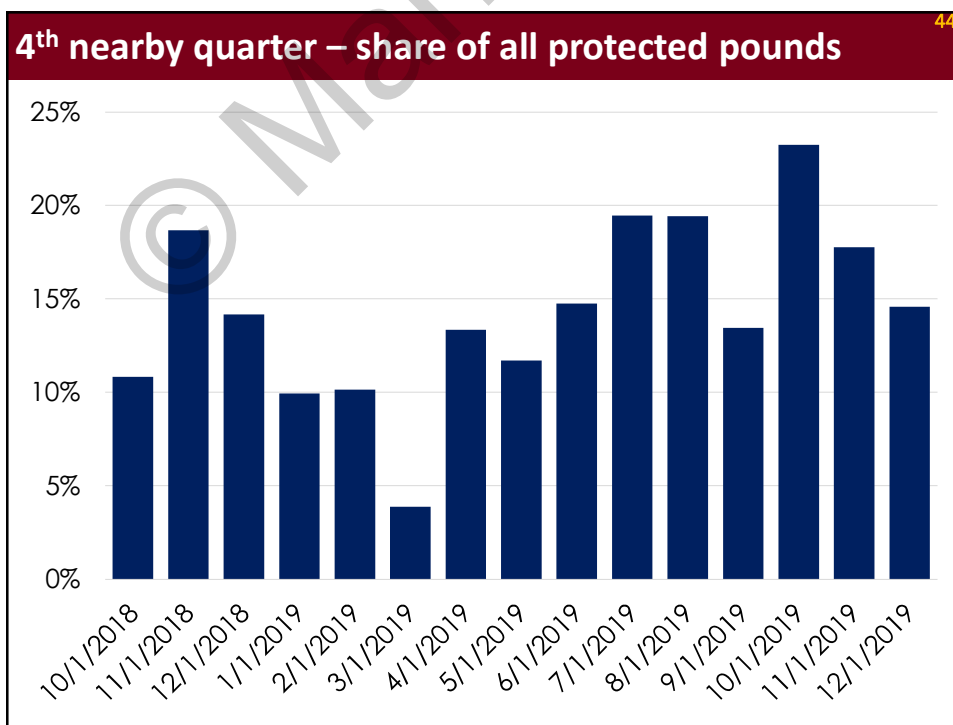
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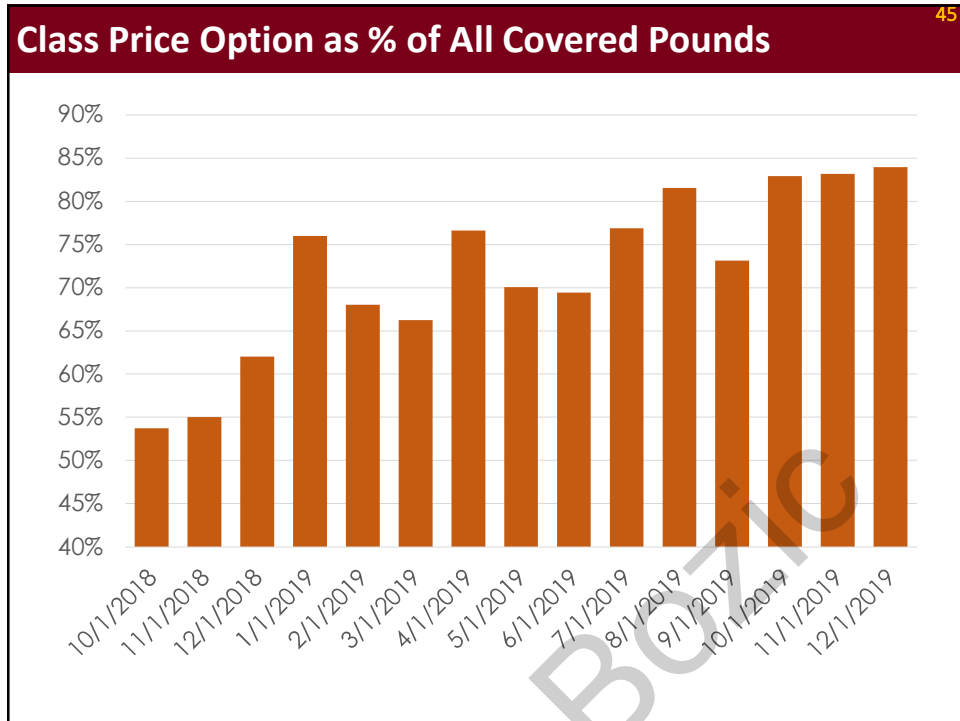
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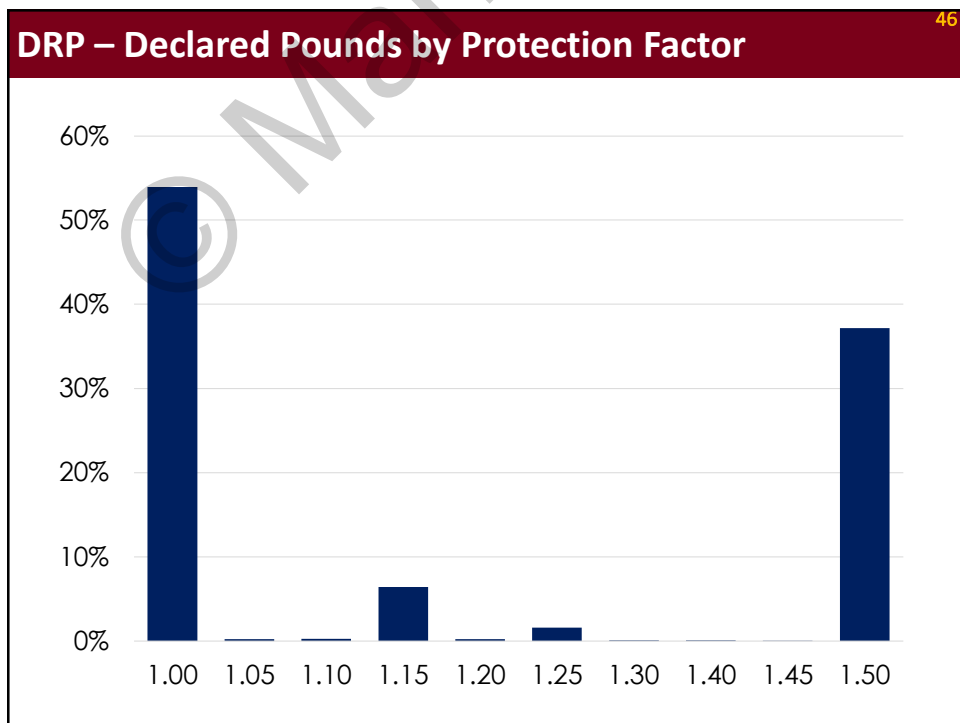
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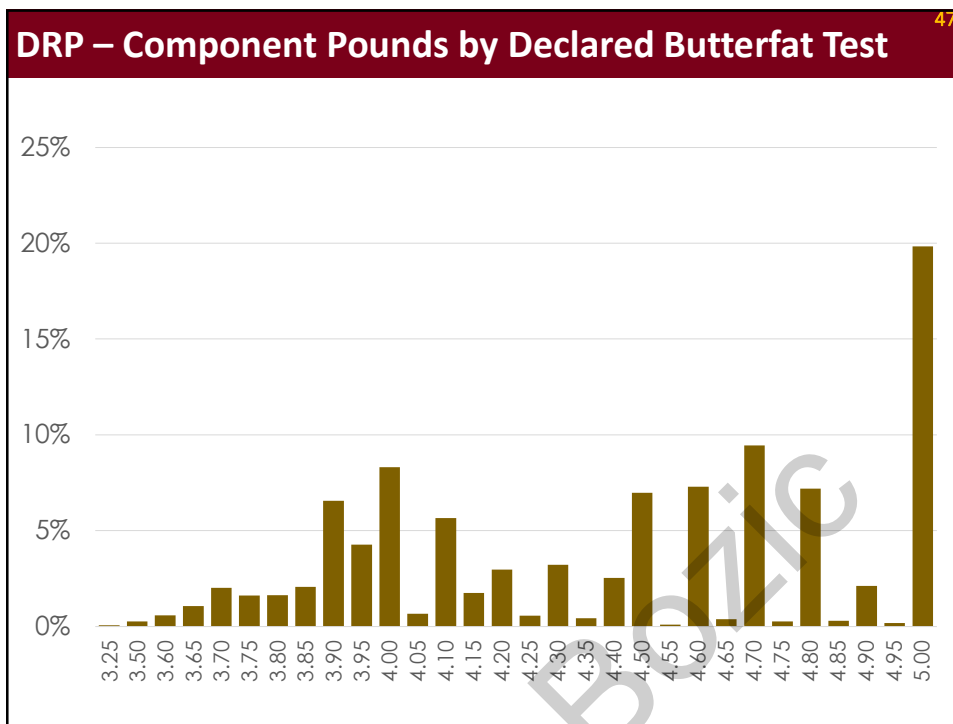
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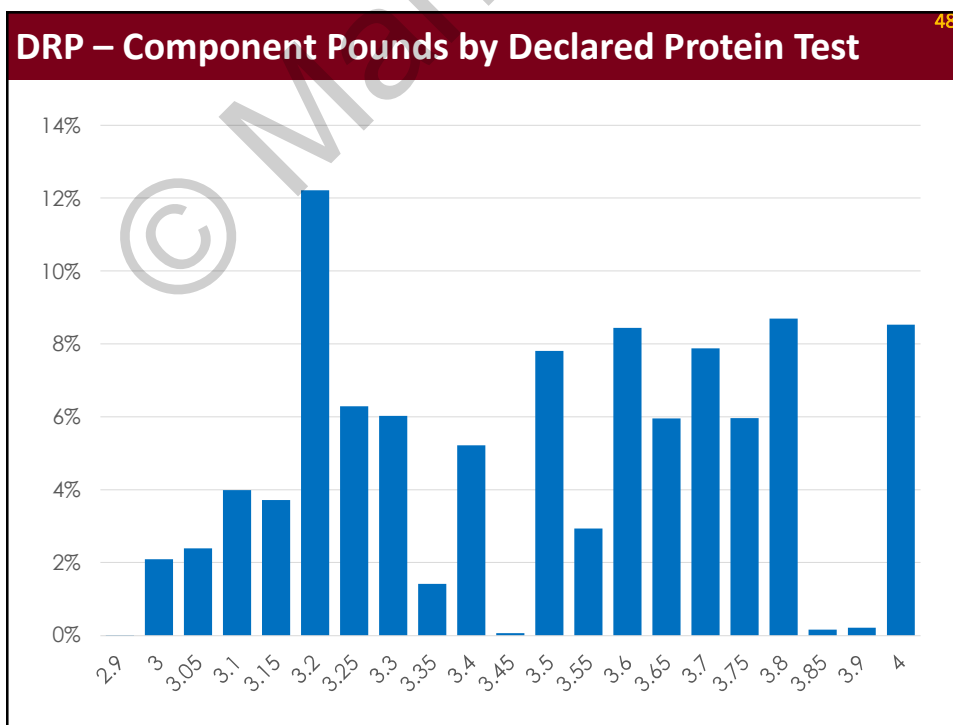
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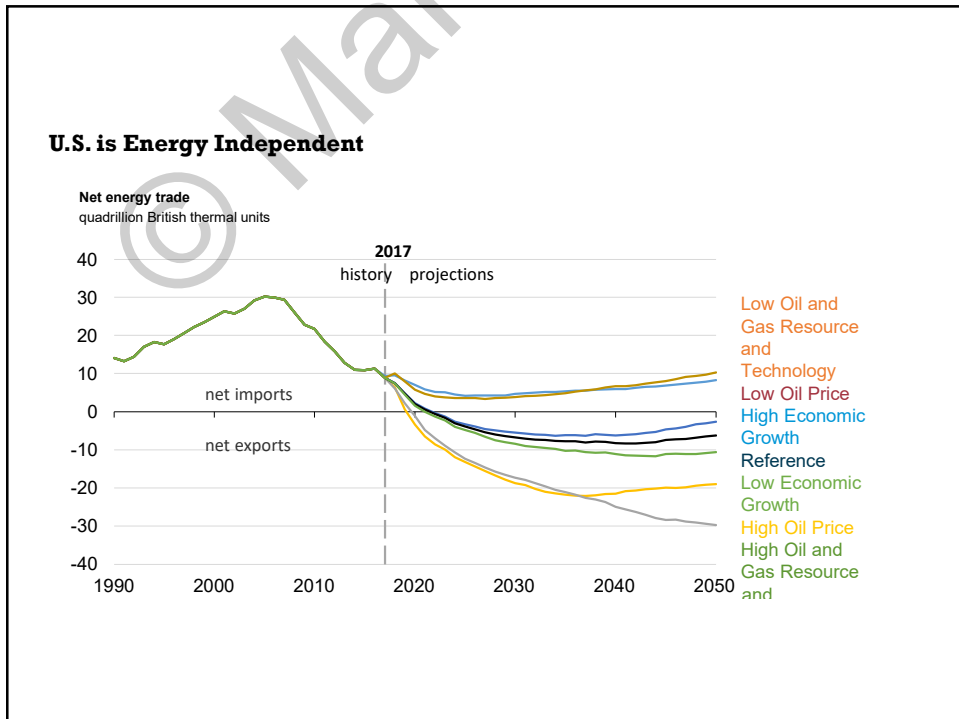


**Does U.S. still have a primary strategic adversary?**

If that is China, what is strategy for the new Cold War?



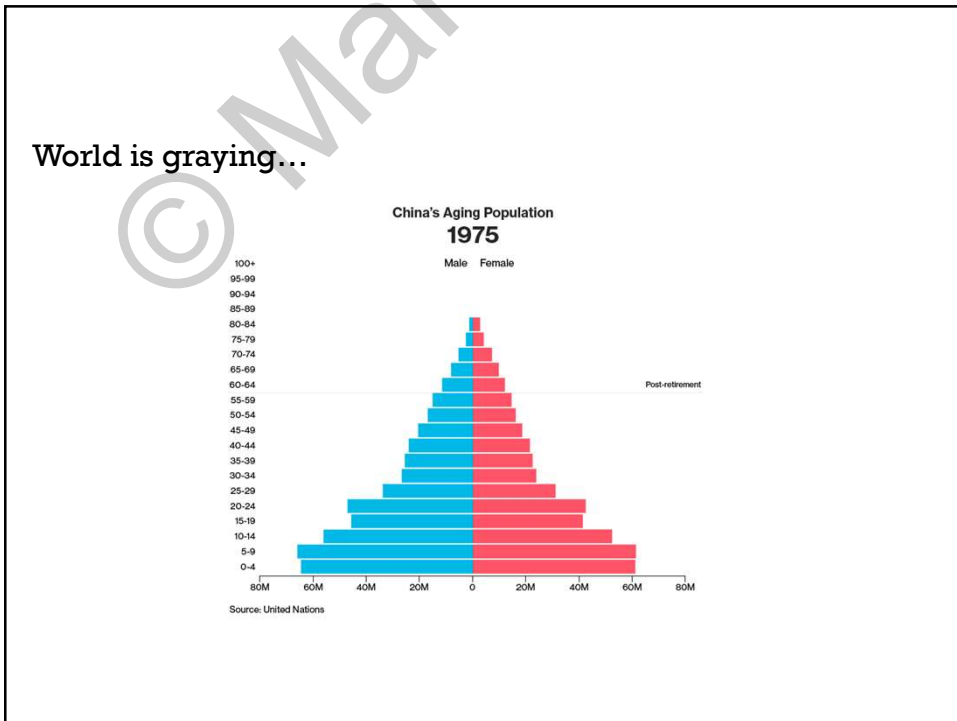
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U.S. President Donald Trump and First Lady Melania Trump greet Japan's Prime Minister Shinzo Abe and his wife Akie Abe at the South Portico of the White House as they arrive for dinner in Washington, on April 26, 2019. (MANDEL NGAN/AFP/Getty Images)


## Trump: US, Japan Close to Reaching Trade Deal

BY EMEL AKAN  
 April 28, 2019 Updated: April 28, 2019

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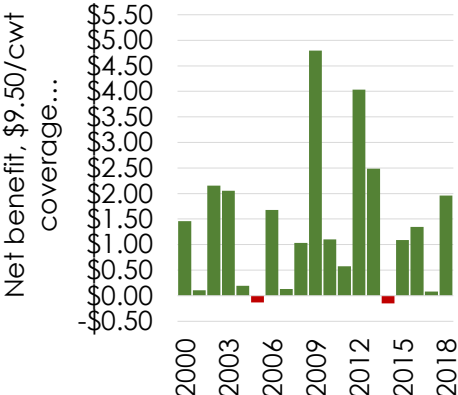
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### Dairy Farmers Get a Safety Net Cocoon to Withstand the Trade Wars



NOVEMBER 30, 2018  
**Trade Wars Trigger Crisis for Dairy Farmers**  
 NEWS | BY LAURIE FISCHER

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Year	Net benefit, \$9.50/cwt coverage
2000	1.50
2001	2.00
2002	2.00
2003	0.50
2004	1.50
2005	0.50
2006	0.50
2007	1.00
2008	1.00
2009	4.50
2010	1.00
2011	0.50
2012	4.00
2013	2.50
2014	1.00
2015	-0.50
2016	1.00
2017	1.50
2018	2.00

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## In Conclusion

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- DMC + DRP = the most generous dairy safety net we had in decades
- Dairy safety net reform strongly influenced by the need to protect US agriculture in
- Chaotic period where the world order is being radically reshaped
- Optimal strategy:
  - Small farms
    - use DMC @ \$9.50/cwt + overhedge with DRP to cover high cost of production
  - Medium-size and large farms:
    - Use DRP distant contracts + CME for more dynamic marketing

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