

RISK MANAGEMENT OPTIONS FOR 2020/21

MARIN
BOZIC

Crop Growers LLP
April 30, 2020



1



Black Swan - An event that comes as a surprise, has a major effect, and is often inappropriately rationalized after the fact with the benefit of hindsight

2

DEALING WITH COVID-19

The Dow's roller coaster ride

It's been a wild ride for the Dow as investors struggle with worries about the novel coronavirus outbreak.



3

DEALING WITH COVID-19

#throwbackthursday

After 2 weeks of quarantine with her husband, Gertrude decided to knit him a scarf..



4

The Great Lockdown (2020) Will Be Worse than the Great Recession (2009)

Latest World Economic Outlook Growth Projections

The COVID-19 pandemic will severely impact growth across all regions.

	PROJECTIONS		
(real GDP, annual percent change)	2019	2020	2021
World Output	2.9	-3.0	5.8
Advanced Economies	1.7	-6.1	4.5
United States	2.3	-5.9	4.7
Euro Area	1.2	-7.5	4.7
Germany	0.6	-7.0	5.2
France	1.3	-7.2	4.5
Italy	0.3	-9.1	4.8
Spain	2.0	-8.0	4.3
Japan	0.7	-5.2	3.0
United Kingdom	1.4	-6.5	4.0
Canada	1.6	-6.2	4.2
Other Advanced Economies	1.7	-4.6	4.5
Emerging Markets and Developing Economies	3.7	-1.0	6.6
Emerging and Developing Asia	5.5	1.9	8.5
China	6.1	1.2	9.2
India	4.2	1.9	7.4
ASEAN-5	4.8	-0.6	7.8
Emerging and Developing Europe	2.1	-5.2	4.2
Russia	1.3	-5.5	3.5
Latin America and the Caribbean	0.1	-5.2	3.4
Brazil	1.1	-5.3	2.9
Mexico	-0.1	-6.6	3.0
Middle East and Central Asia	1.2	-2.8	4.0
Saudi Arabia	0.3	-2.3	2.9
Sub-Saharan Africa	3.1	-1.6	4.1
Nigeria	2.2	-3.4	2.4
South Africa	0.2	-5.8	4.0
Low-Income Developing Countries	5.1	0.4	5.6

Source: IMF, World Economic Outlook, April 2020

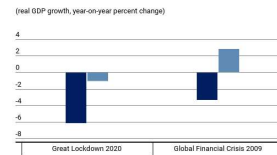
INTERNATIONAL MONETARY FUND

IMF.org

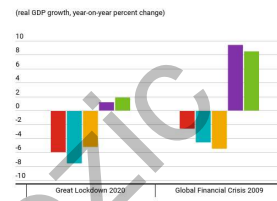


Global crisis

Both advanced economies and emerging market and developing economies are in recession. Major economies have also been significantly downgraded.



● Advanced economies ● Emerging market and developing economies



Source: IMF, World Economic Outlook

INTERNATIONAL MONETARY FUND

5

DAIRY RETAIL SALES HAVE DRAMATICALLY INCREASED

FLUID MILK

- **Fluid milk** volume sales are up **+33.6%**. For perspective, fluid milk sales were down -3.8% at the end of 2019.
- Looking at San Francisco/Oakland, California, an area that has much greater spread of COVID-19, fluid milk volume sales have increased **+42.8%**. This may mean our region has more sales growth to come.
- Extended shelf life milks (Fairlife is an example of an extended shelf life milk) have an increase of **+70.3%** in volume sales.

SHELF-STABLE MILK

- We are also tracking shelf-stable milk volume sales, which are up **+64.2%**. Again, this is even higher in the areas with greater COVID-19 impact (increase of **+142% in New York, NY**).

POWDERED MILK

- Has an increase of **+366.8%** in volume sales.

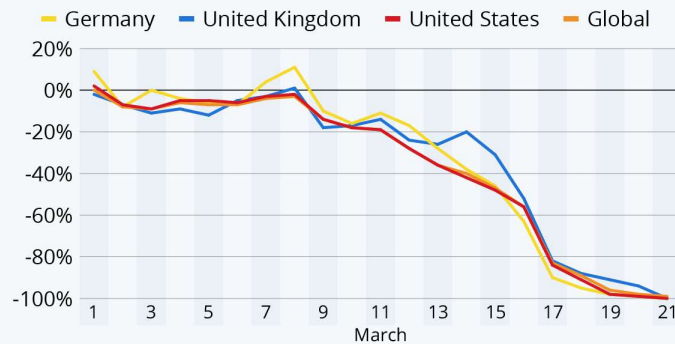
OTHER DAIRY FOODS

- **Butter** has increased **+85.2%** in volume sales (in 2019, had an increase of +2.3%).
- **Natural cheese** is up **+62%** in volume sales (In 2019, had an increase of +2.2%).
- Processed cheese is up **+72.1%** in volume sales (In 2019, had a decrease of -2.5%).
- Yogurt is up **+41.3%** in volume sales (In 2019, had a decrease of -1.2%).
- Refrigerated alternative beverages are up **+68%** in volume sales and shelf stable alternative beverages have grown **+173%** in volume sales.

6

Restaurant Industry Collapses Due to Widespread Shutdowns

Year-over-year change in seated diners at restaurants on the OpenTable network*

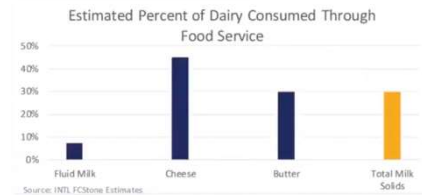


* Incl. online reservations, phone reservations, and walk-ins.
For year-over-year comparisons, OpenTable compared each day to the same day of the week from the same week in 2019.

Source: OpenTable



statista



Estimated Meals and Milk Consumption per Month (Per Capita, Assumes 0.47 pounds/homemade meal, 0.61 foodservice)			
	Normal Month	covid-19 Month	% Change
Homemade:	68.6	72.6	6%
Foodservice:	22.7	18.6	-18%
In restaurant	8.4	4.2	-50%
At home	7.3	10.9	50%
Work/other	7.0	3.5	-50%
Pounds Milk:	46.3	45.7	-1.3%

Source: INTL FStone Scientific Wild Guesses and Algebra

7

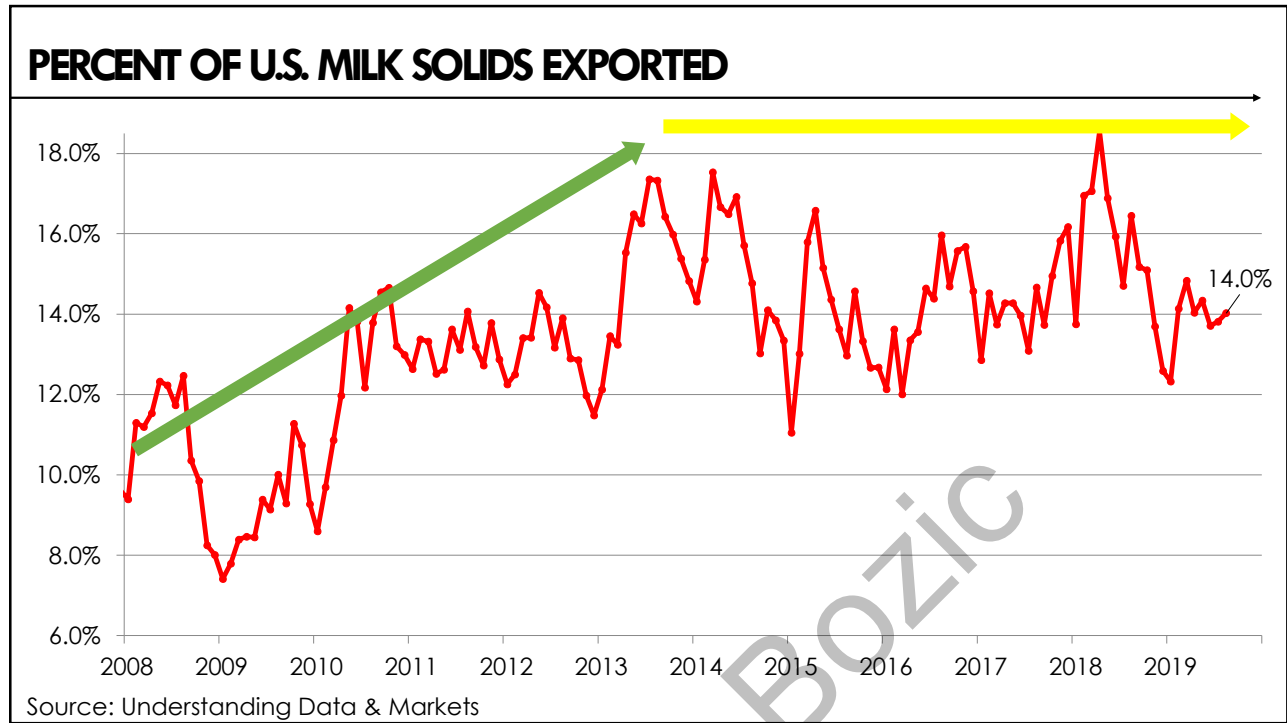
DOMESTIC DAIRY CONSUMPTION BY CHANNEL

Domestic Sales Before COVID-19				Retail After COVID-19 (Weekly, Year-on-Year Growth)			
Segment	Retail	Food Service	Other	Segment	March 15	March 29	April 5
Fluid Milk	65%	15%	20%	Fluid Milk	+33%	+3.4%	+14%
Cheese	45%	45%	10%	Cheese	+62%	+26%	+33%
Butter	45%	45%	10%	Butter	+85%	+59%	+73%
Ice Cream	70%	20%	10%	Pizza		+46%	+52%
Yogurt	80%	5%	15%	Yogurt	+41%	-7%	-2%

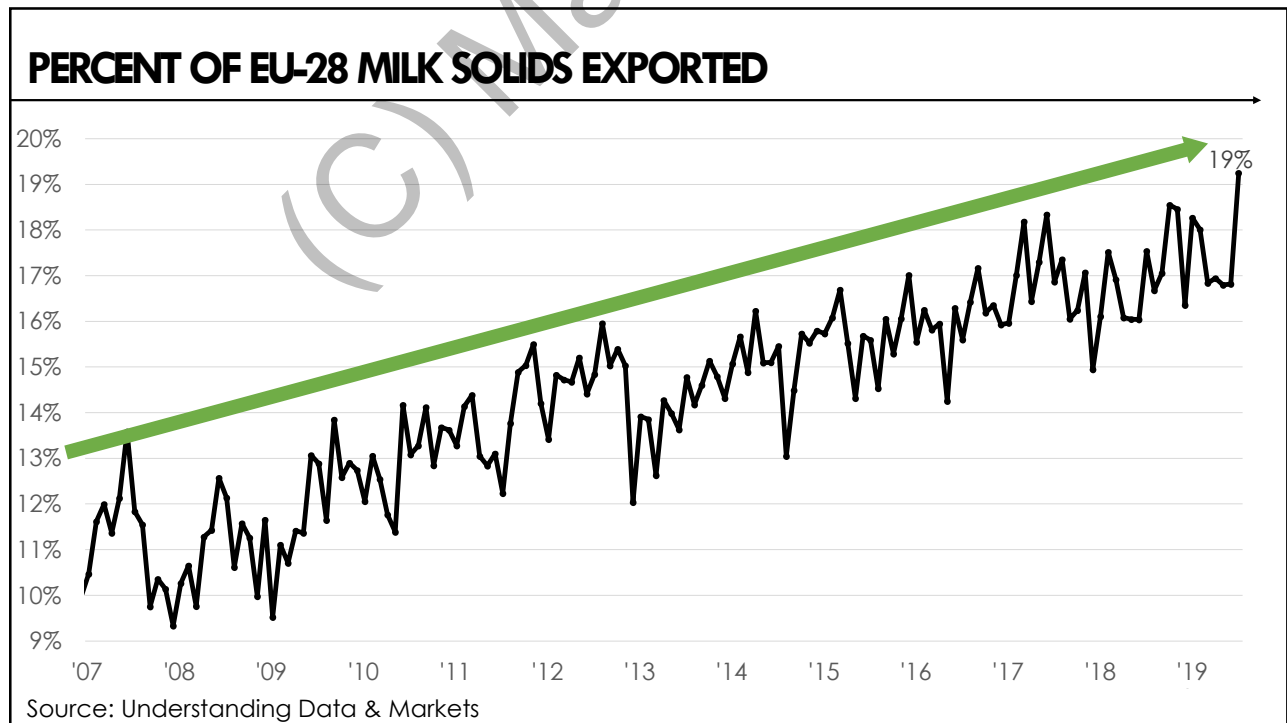
Source: Industry estimates by Blimling and Associates, INTL FStone and Matt Gould.

Source: IRI, published by Midwest Dairy Association

8



9



10

EVOLUTION OF EXPECTED PRICES: APR-JUN 2020

CLASS III MILK



Expected Prices for Apr-Jun 2020			
Class III Milk Price	Date	Price	Expected Price Percentile
Latest	Apr 15, 2020	\$12.40	0%
Previous	Apr 14, 2020	\$12.29	0%
Last 7 Days		\$12.39	0%
Low	Apr 13, 2020	\$12.25	
High	Apr 9, 2020	\$12.60	
Last 30 Days		\$14.02	3%
Low	Apr 13, 2020	\$12.25	
High	Mar 17, 2020	\$15.67	
Apr-Jun, 2020		\$16.31	
Low	Apr 13, 2020	\$12.25	
High	Jan 24, 2020	\$17.88	

CLASS IV MILK



Expected Prices for Apr-Jun 2020			
Class IV Milk Price	Date	Price	Expected Price Percentile
Latest	Apr 15, 2020	\$11.16	0%
Previous	Apr 14, 2020	\$11.07	0%
Last 7 Days		\$11.28	0%
Low	Apr 14, 2020	\$11.07	
High	Apr 9, 2020	\$11.60	
Last 30 Days		\$12.39	3%
Low	Apr 14, 2020	\$11.07	
High	Mar 20, 2020	\$14.14	
Apr-Jun, 2020		\$17.08	
Low	Apr 14, 2020	\$11.07	
High	Aug 31, 2018	\$19.00	

11

PROCESSORS ARE IMPOSING SUPPLY MANAGEMENT PROGRAMS

- Cooperatives implementing two-tier pricing
 - Base tradeable?
 - Overbase milk paid for?
- Private buyers pooled on FMMOs cannot do two-tier pricing – no pay for overbase milk
- Long term impacts:
 - More buyers will have base systems in place
 - “Efficiency” will be somewhat traded off for “robustness”

12

DAIRY REVENUE PROTECTION IS A GAME CHANGER

Covered production: 50 bil lbs

Calendar Year 2020 Projected Indemnities

- California: \$242 mil
- Wisconsin: \$137 mil
- Idaho: \$101 mil
- Texas: \$95 mil
- Minnesota: \$40 mil
- New York: \$39 mil
- Pennsylvania: \$13 mil
- Vermont: \$4 mil



U.S. Projected Indemnities for Calendar Year 2020: 1.1 billion

15

CRITICAL MASS ACHIEVED, NO MORE BAILOUTS

State	Percent of Milk Production Covered by DRP + DMC
California	31%
Wisconsin	51%
Idaho	38%
New York	19%
Texas	48%
Michigan	30%
Pennsylvania	22%
Minnesota	73%
New Mexico	29%
Washington	24%

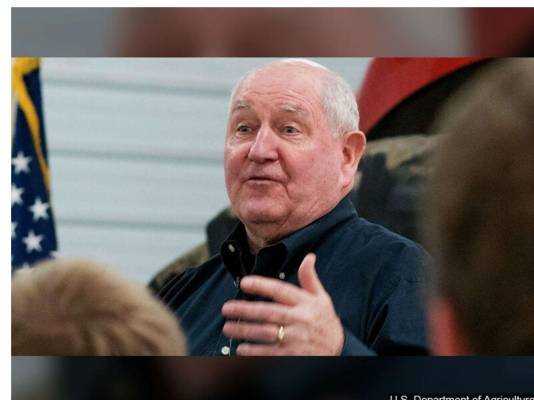
Calculated as (DRP [Declared * Protection Factor] + DMC [Tier 1 \$4.50 and higher]) / 2019 Milk Production

LIVESTOCK

Perdue Says USDA Will Not Reopen the Dairy Margin Coverage Program



by Anna-Lisa Laca 10:07AM Apr 16, 2020



U.S. Department of Agriculture

16

WHAT TO DO NOW?

USDA Announces Coronavirus Food Assistance Program

(Washington, D.C., April 17, 2020) – U.S. Secretary of Agriculture Sonny Perdue today announced the Coronavirus Food Assistance Program (CFAP). This new U.S. Department of Agriculture (USDA) program will take several actions to assist farmers, ranchers, and consumers in response to the COVID-19 national emergency. President Trump directed USDA to craft this \$19 billion immediate relief program to provide critical support to our farmers and ranchers, maintain the integrity of our food supply chain, and ensure every American continues to receive and have access to the food they need.

Press Release
Release No. 0222.20

Contact: USDA Press
Email: press@oc.usda.gov

"During this time of national crisis, President Trump and USDA are standing with our farmers, ranchers, and all citizens to make sure they are taken care of," Secretary Perdue said. "The American food supply chain had to adapt, and it remains safe, secure, and strong, and we all know that starts with America's farmers and ranchers. This program will not only provide immediate relief for our farmers and ranchers, but it will also allow for the purchase and distribution of our agricultural abundance to help our fellow Americans in need."

17

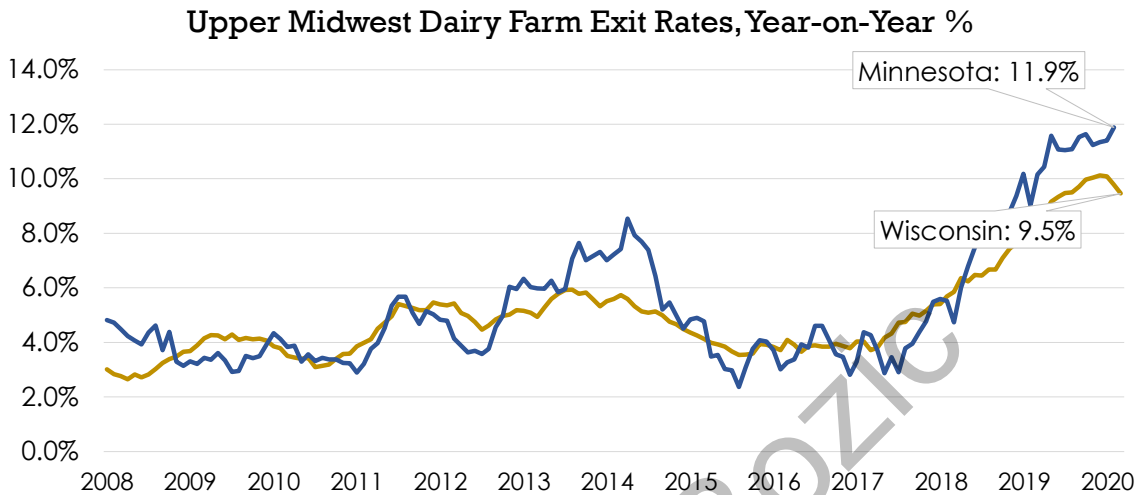
MINIMIZE REGRET

Now is the time to start hedging 2021:

- 1) Every two weeks, look at the available prices.
- 2) If you like the prices, hedge at least 5% of projected marketings. If you *really* like the prices, hedge more.
- 3) If you do not like the prices, hedge at least 2% of projected marketings
- 4) Target having 65% of milk declared covered 3-4 months before the start of the quarter, with PF = 1.5
- 5) Leave 35% for 'opportunistic hedging' in the last 3-4 months.

18

DAIRY CONSOLIDATION IN UPPER MIDWEST



19

HOW WILL MINNESOTA DAIRY LOOK LIKE IN 2030?

Year	3%	7%	10%	15%
2019	2,730	2,730	2,730	2,730
2020	2,648	2,539	2,457	2,321
2021	2,569	2,361	2,211	1,973
2022	2,492	2,196	1,990	1,677
2023	2,417	2,042	1,791	1,425
2024	2,344	1,899	1,612	1,211
2025	2,274	1,766	1,451	1,029
2026	2,206	1,642	1,306	875
2027	2,140	1,527	1,175	744
2028	2,076	1,420	1,058	632
2029	2,014	1,321	952	537
2030	1,954	1,229	857	456

20

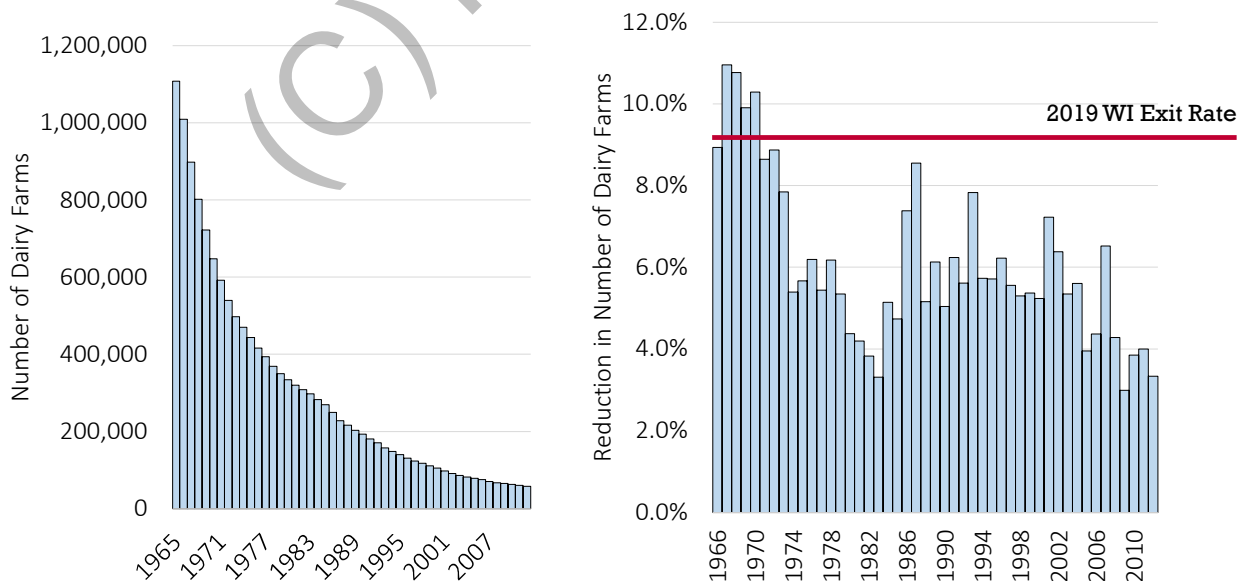
HOW WILL U.S. DAIRY LOOK LIKE IN 2030?

Year	3%	7%	10%	15%
2019	34,187	34,187	34,187	34,187
2020	33,161	31,794	30,768	29,059
2021	32,166	29,568	27,691	24,700
2022	31,201	27,498	24,922	20,995
2023	30,265	25,573	22,430	17,846
2024	29,357	23,783	20,187	15,169
2025	28,476	22,118	18,168	12,894
2026	27,622	20,570	16,351	10,960
2027	26,793	19,130	14,716	9,316
2028	25,989	17,791	13,244	7,919
2029	25,209	16,546	11,920	6,731
2030	24,453	15,388	10,728	5,721

21

Consolidation pace over time

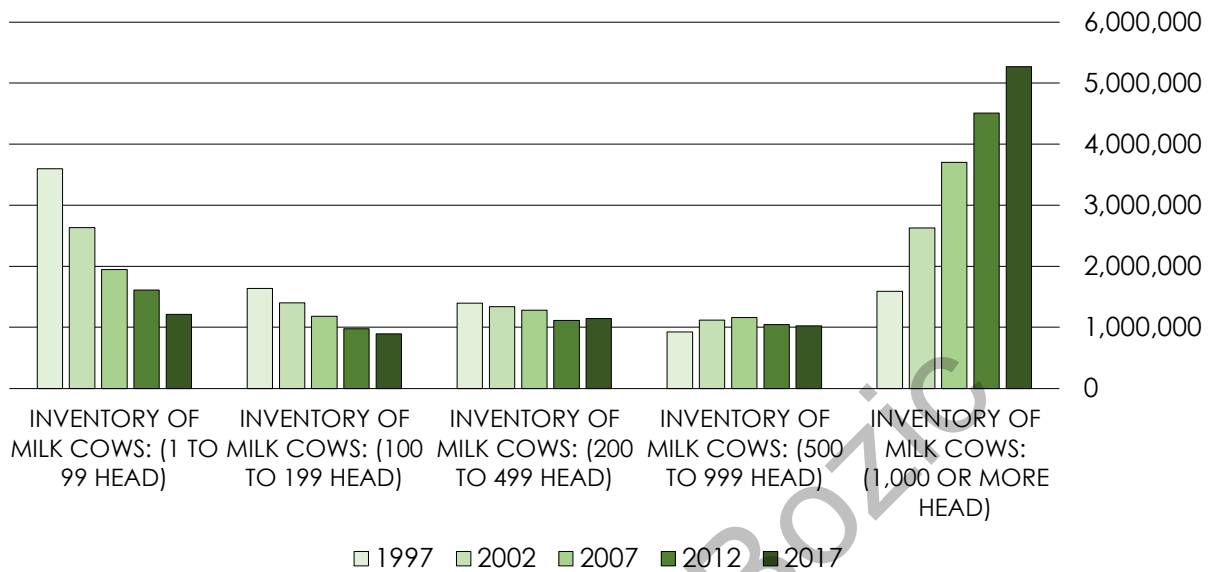
22



22

U.S. Dairy Herd by Size of Operation

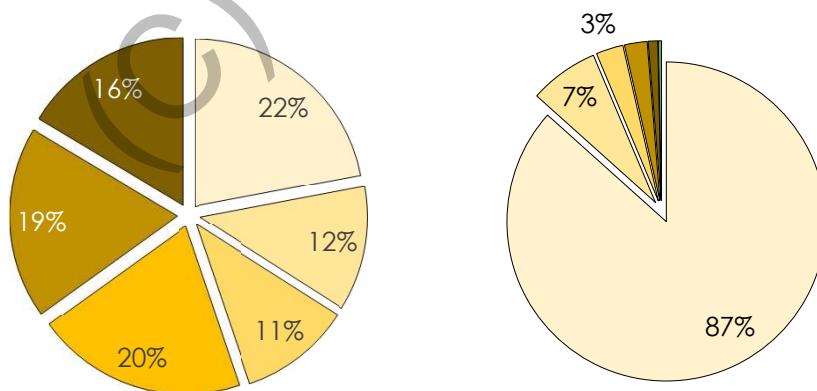
23



23

U.S. Dairy Herd by Size of Operation (2017)

24

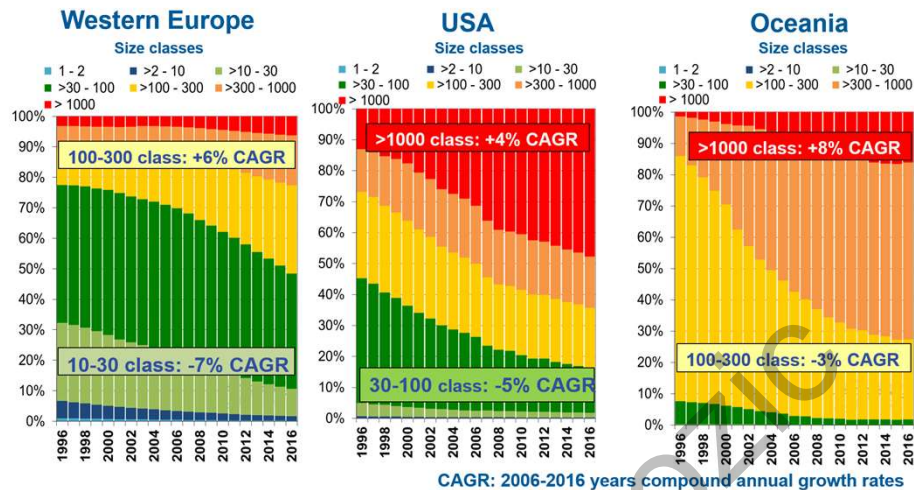


	< 200 HEAD	200 TO 499 HEAD	500 TO 999 HEAD	1,000 TO 2,499 HEAD	2,500 TO 4,999 HEAD	5,000 OR MORE HEAD
OPERATIONS	47,305	3,830	1,511	1,239	525	189
COWS	2,102,707	1,144,357	1,023,374	1,938,306	1,767,468	1,563,419

24

Dairy Herd Composition in 2016

25




Source: IFCN

25

Recent U.S. political and foreign policy surprises

- Donald J. Trump elected President
- Withdrawal from Trans-Pacific Partnership
- Withdrawal from Paris Climate Agreement
- Conciliatory overtures to North Korea
- Leaving Iraq, Syria, Afghanistan
- Trade war with China
- Not reacting to attacks on global oil supply chain
- Implements the most generous dairy safety net since late 1970s
- Impeachment inquiry ahead of 2020

26



Business Markets World Politics TV More

BUSINESS NEWS JULY 2, 2018 / 6:30 AM / 8 MONTHS AGO

Trump threatens action on WTO after reports he wants to withdraw



Billionaires Innovation Leadership Money Consumer Industry Life

2,163 views | Sep 27, 2018, 02:42pm


Trump Is Close To Shutting Down The WTO's Appeals Court



Menu Search


February 28, 2019, 3:00 AM CST

U.S.-China Negotiations Risk Shutting Out the Rest of the World




Most-favored-nation (MFN): treating other people equally. Under the WTO agreements, countries cannot normally discriminate between their trading partners. **Grant someone a special favor (such as a lower customs duty rate for one of their products) and you have to do the same for all other WTO members.**

27

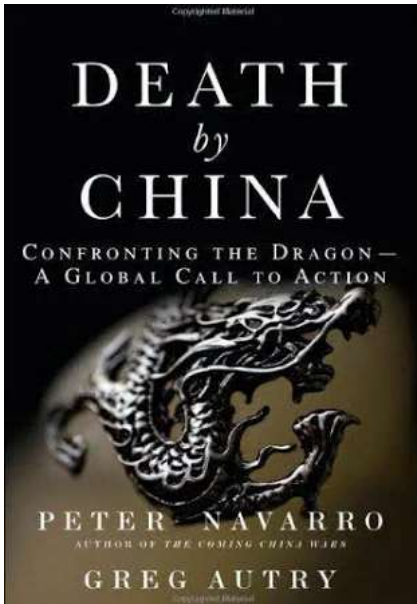


Does U.S. still have a primary strategic adversary?

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



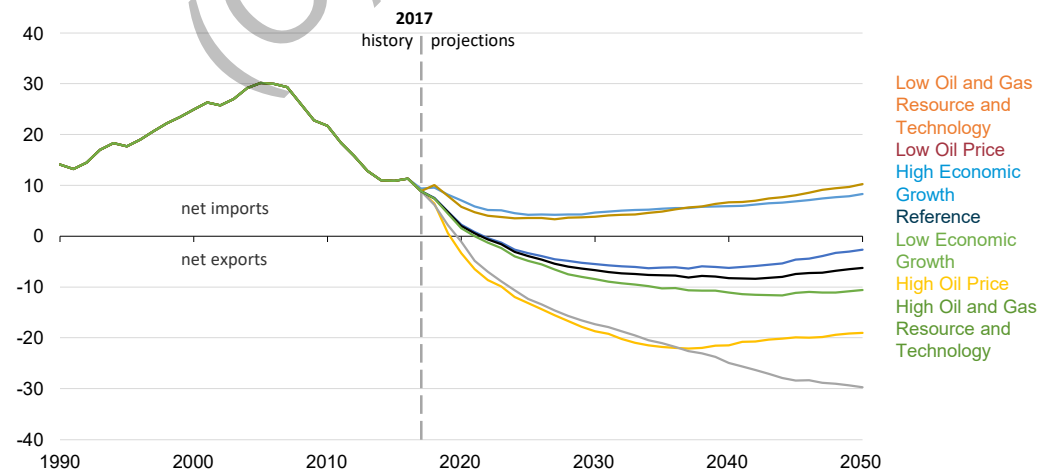
28



29

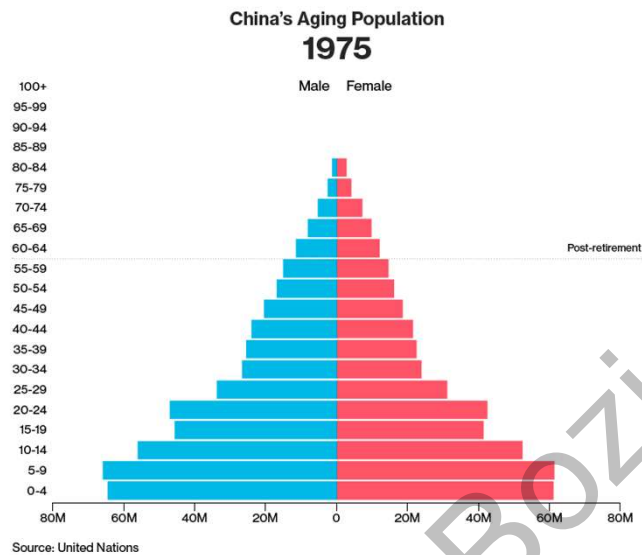
U.S. is Energy Independent

Net energy trade
quadrillion British thermal units



30

World is graying...



31



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

Share [f](#) [v](#) [t](#) [r](#) [e](#) [m](#) [a](#) [i](#)

32

Meanwhile in China...



Xi Jinping becomes most powerful leader since Mao with China's change to constitution

Rare accolade puts Xi's Thought on Socialism with Chinese Characteristics into Communist charter and sets him on course for indefinite spell in power

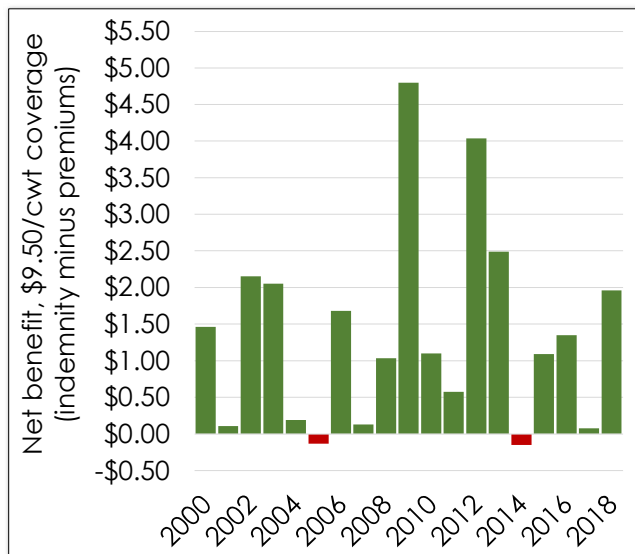
Is Xi or isn't Xi? Who said it - Jinping or Mao Zedong?



China's Communist party enshrines Xi Jinping ideology in constitution - video

33

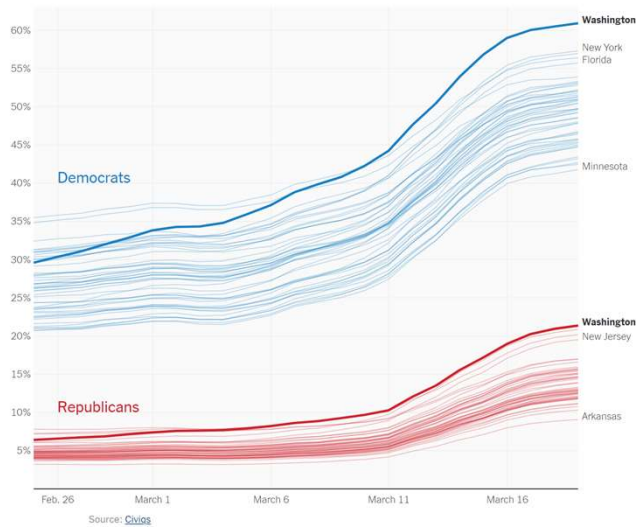
Dairy Farmers Get a a Safety Net Cocoon to Withstand the Trade Wars



34

APRIL LIKE YOU'VE NEVER SEEN IT BEFORE

"Extremely concerned" about a coronavirus outbreak, state by state



Trump calls for restarting economy by Easter: 'We have to get back to work'

MSN.com
20 hours ago



Obama urges Americans to continue social distancing despite Trump's wishes to...

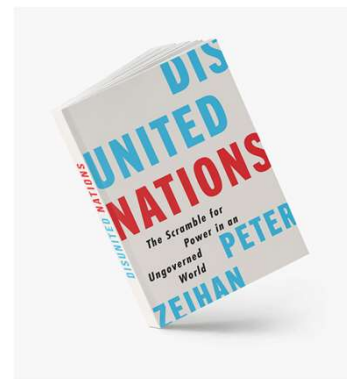
CNN.com
31 mins ago

In normal times, statistical value of life is 7-9 million USD.

How much is one life worth, when 30% of population is unemployed?

35

SHORT-TERM SHOCK OR A TRIGGER TOWARDS A NEW ERA?



36

NOW IS THE TIME TO LOCK IN Q1-Q3 2021

DFA/Glanbia Plant Under Construction in Michigan



Source: <https://cropinsurance.farmcredit.com>

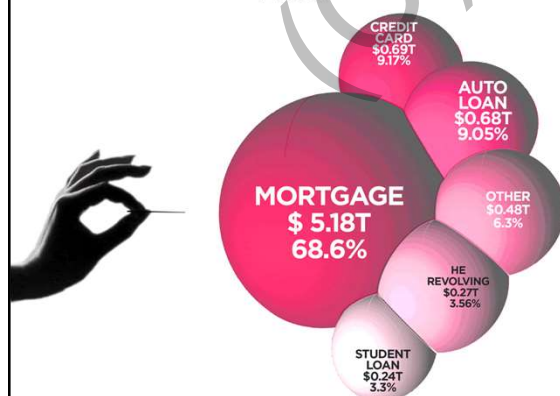
What-If Analysis

Dairy	Month	Expected	Actual
Cheese	Apr-21	\$1.7580	1.5000
	May-21	\$1.7560	1.5000
	Jun-21	\$1.7540	1.5000
Price	Components	Class III & IV	
Expected DRP Revenue (per cwt)	\$18.72	\$16.90	
Final Revenue Guarantee (\$)	\$177,842	\$160,550	
DRP Revenue Guarantee (per cwt)	\$17.78	\$16.06	
Actual Revenue (\$)	\$160,805	\$145,500	
Actual Revenue (per cwt)	\$16.08	\$14.55	
Gross Indemnity (\$)	\$17,037	\$15,050	
Gross Indemnity (per cwt)	\$1.70	\$1.51	
Net Indemnity (\$)	\$14,535	\$13,067	
Net Indemnity (per cwt)	\$1.45	\$1.31	

37

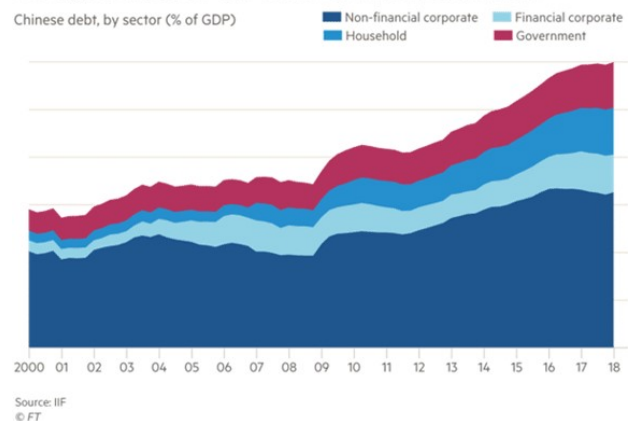
THE NEXT BUBBLE: CHINA

The Great American Debt Bubble
Total Household Debt & Composition
2003



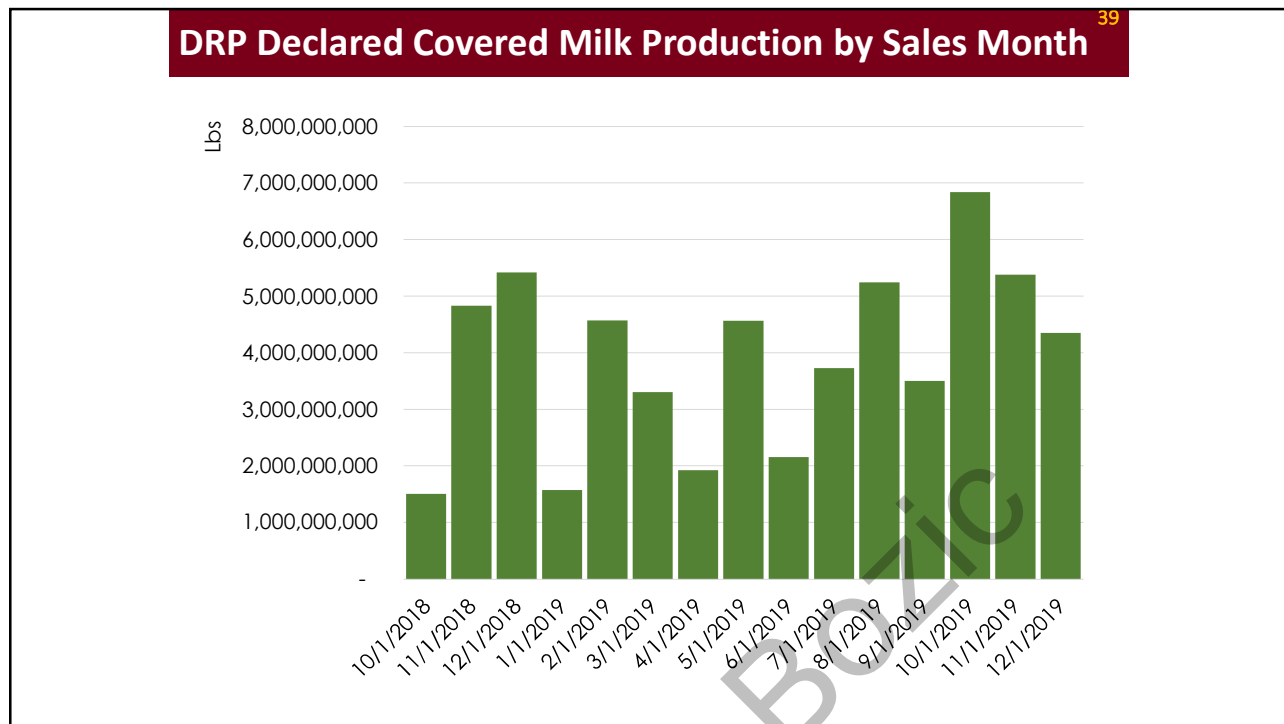
The biggest increase in debt was in non-financial corporations

Chinese debt, by sector (% of GDP)

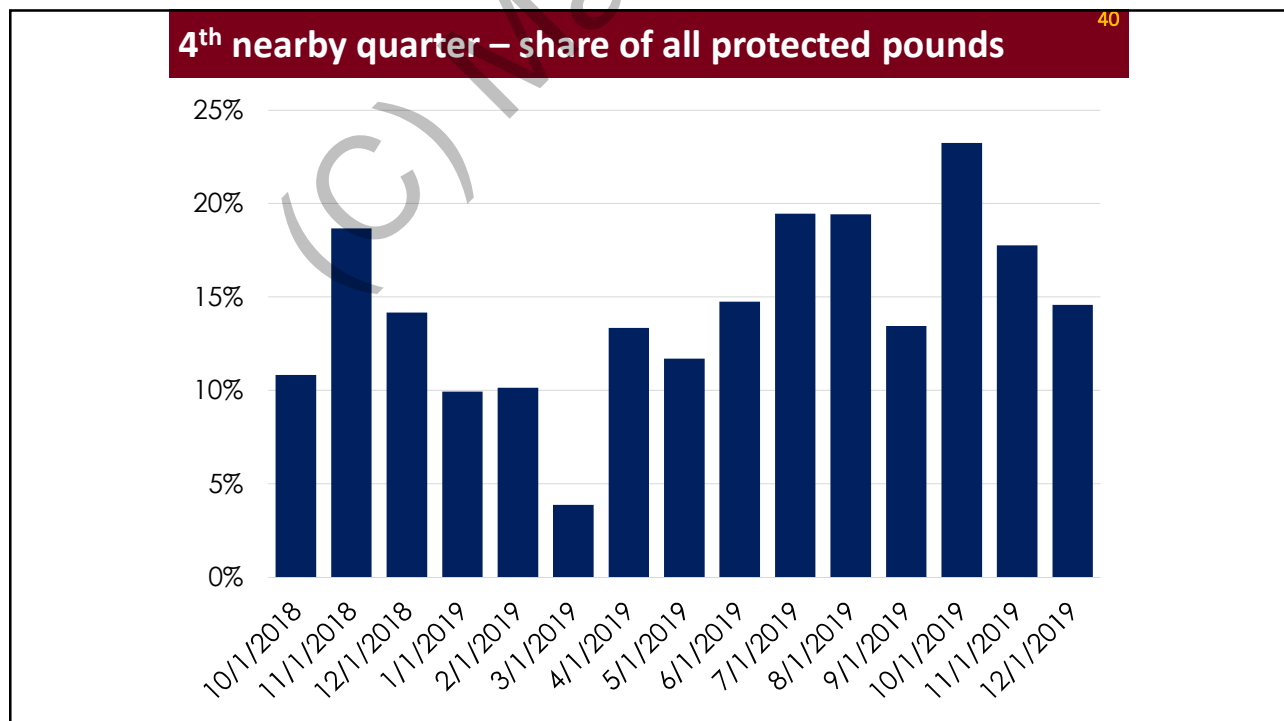


Source: Seeking Alpha

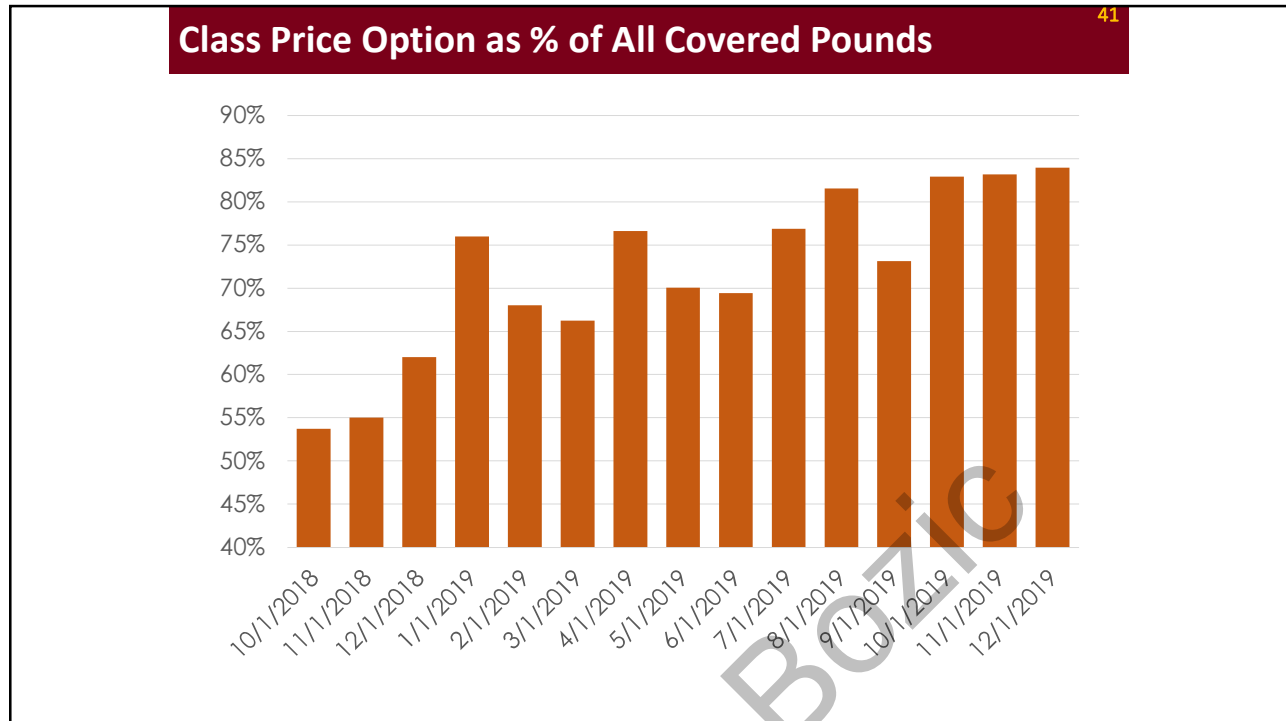
38



39



40



41

RISK STRATEGY FOR 'NORMAL TIMES'

Type	Measures	LOSS MITIGATION			BREAK-EVEN PROTECTION	
		Jul-Sep, 2020	Oct-Dec, 2020	Jan-Mar, 2021	Apr-Jun, 2021	Jul-Sep, 2021
Components	Declared Butterfat Test			3.95		3.8
	Declared Protein Test			3.2		3.05
	Expected Revenue			\$17.62		\$17.95
	Revenue Guarantee			\$16.74		\$17.05
	Producer Premium Amount			\$0.3283		\$0.3568
	Expected Basis			0.56		0.41
	Expected Revenue Floor			\$16.97		\$17.10
Class Blend (100% Class III, 0% Class IV)	Expected Revenue	\$16.06	\$16.07	\$15.73	\$16.25	
	Revenue Guarantee	\$15.26	\$15.27	\$14.94	\$15.44	
	Producer Premium Amount	\$0.2378	\$0.2904	\$0.2565	\$0.2650	
	Expected Basis	1.33	2.05	2.03	1.42	
	Expected Revenue Floor	\$16.35	\$17.03	\$16.71	\$16.59	

42

HEDGING DISTANT MONTHS → CLUSTERED PAYMENTS

Historical Analysis

Days Until Covered Quarter 394

Year 2008 → 2020

Performance 2008 - 2020	Component Pricing Option	Class Pricing Option
# of Quarters	47	47
# Quarters Paying Out	16	17
DRP Premium per cwt	\$0.25	\$0.20
Average Payment per cwt	\$0.47	\$0.73
Max. Payment per cwt	\$3.02	\$7.00
Average Net Indemnity per cwt	\$0.22	\$0.53
Cumulative Net Indemnity Amount	\$103,400	\$249,100

DRP Gross Indemnities (Assuming no Yield Shocks)

Insurance Strategy: 100% Class III, 0% Class IV,
95% Coverage LevelSource: <https://cropinsurance.farmcredit.com>

43

HEDGING NEARBY MONTHS → DISPERSED PAYMENTS

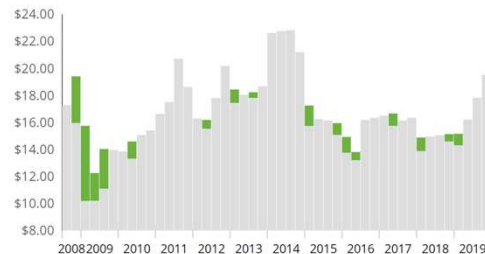
Historical Analysis

Days Until Covered Quarter 99

Year 2008 → 2020

Performance 2008 - 2020	Component Pricing Option	Class Pricing Option
# of Quarters	46	46
# Quarters Paying Out	13	16
DRP Premium per cwt		\$0.24
Average Payment per cwt	\$0.25	\$0.54
Max. Payment per cwt	\$1.64	\$5.56
Average Net Indemnity per cwt		\$0.30
Cumulative Net Indemnity Amount		\$138,000

DRP Gross Indemnities (Assuming no Yield Shocks)

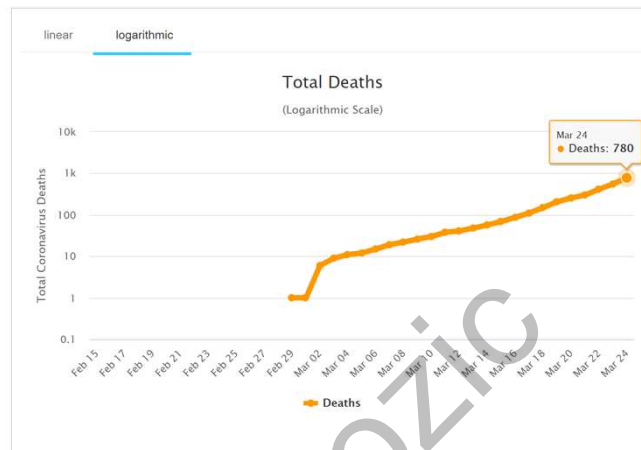
Insurance Strategy: 100% Class III, 0% Class IV,
95% Coverage LevelSource: <https://cropinsurance.farmcredit.com>

44

APRIL LIKE YOU'VE NEVER SEEN IT BEFORE



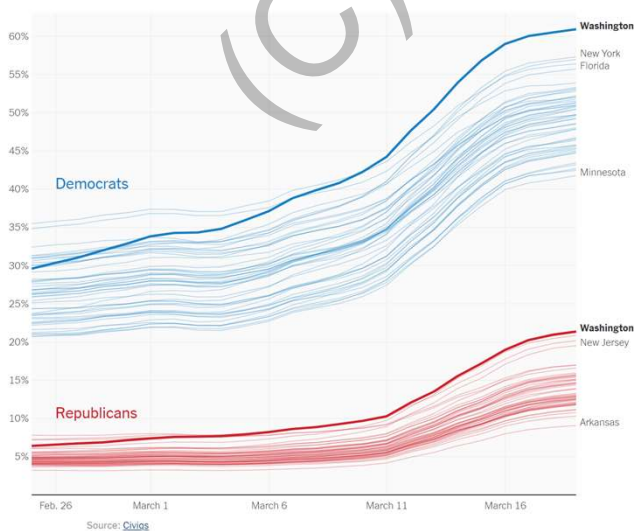
Total Coronavirus Deaths in the United States



45

APRIL LIKE YOU'VE NEVER SEEN IT BEFORE

"Extremely concerned" about a coronavirus outbreak, state by state



Trump calls for restarting economy by Easter: 'We have to get back to work'

MSN.com
20 hours ago



Obama urges Americans to continue social distancing despite Trump's wishes to...

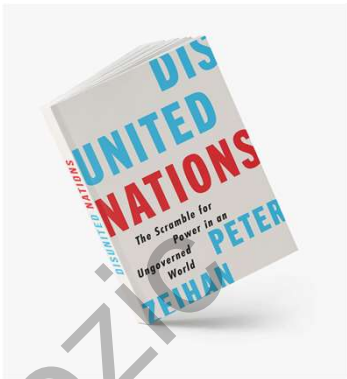
CNN.com
31 mins ago

In normal times, statistical value of life is 7-9 million USD.

How much is one life worth, when 30% of population is unemployed?

46

SHORT-TERM SHOCK OR A TRIGGER TOWARDS A NEW ERA?



47

RISK STRATEGY FOR 'VIRAL DEPRESSIONS'

		LOSS MITIGATION				
Type	Measures	Jul-Sep, 2020	Oct-Dec, 2020	Jan-Mar, 2021	Apr-Jun, 2021	Jul-Sep, 2021
Components	Declared Butterfat Test			3.95		3.8
	Declared Protein Test			3.2		3.05
	Expected Revenue			\$17.62		\$17.95
	Revenue Guarantee			\$16.74		\$17.05
	Producer Premium Amount			\$0.3283		\$0.3568
	Expected Basis			0.56		0.41
Class Blend (100% Class III, 0% Class IV)	Expected Revenue Floor			\$16.97		\$17.10
	Expected Revenue	\$16.06	\$16.07	\$15.73	\$16.25	
	Revenue Guarantee	\$15.26	\$15.27	\$14.94	\$15.44	
	Producer Premium Amount	\$0.2378	\$0.2904	\$0.2565	\$0.2650	
	Expected Basis	1.33	2.05	2.03	1.42	
	Expected Revenue Floor	\$16.35	\$17.03	\$16.71	\$16.59	

48