

2020 Dairy Market and Policy Issues

Christopher A. Wolf, Professor

Dyson School of Applied Economics and Management

Cornell University

Topics for Today

- Dairy consumption trends
- Dairy trade issues
- Dairy farm structural change

Is dairy consumption all bad news?

Los Angeles Times

SUBSCRIBE
Try for \$1 a week

FOOD FOR THOUGHT

Why Are Americans Drinking Less Cow's Milk? Its Appeal Has Curdled

May 16, 2017 · 2:23 PM ET

As milk consumption falls, Borden Dairy Co. files for bankruptcy protection



Economic Policy

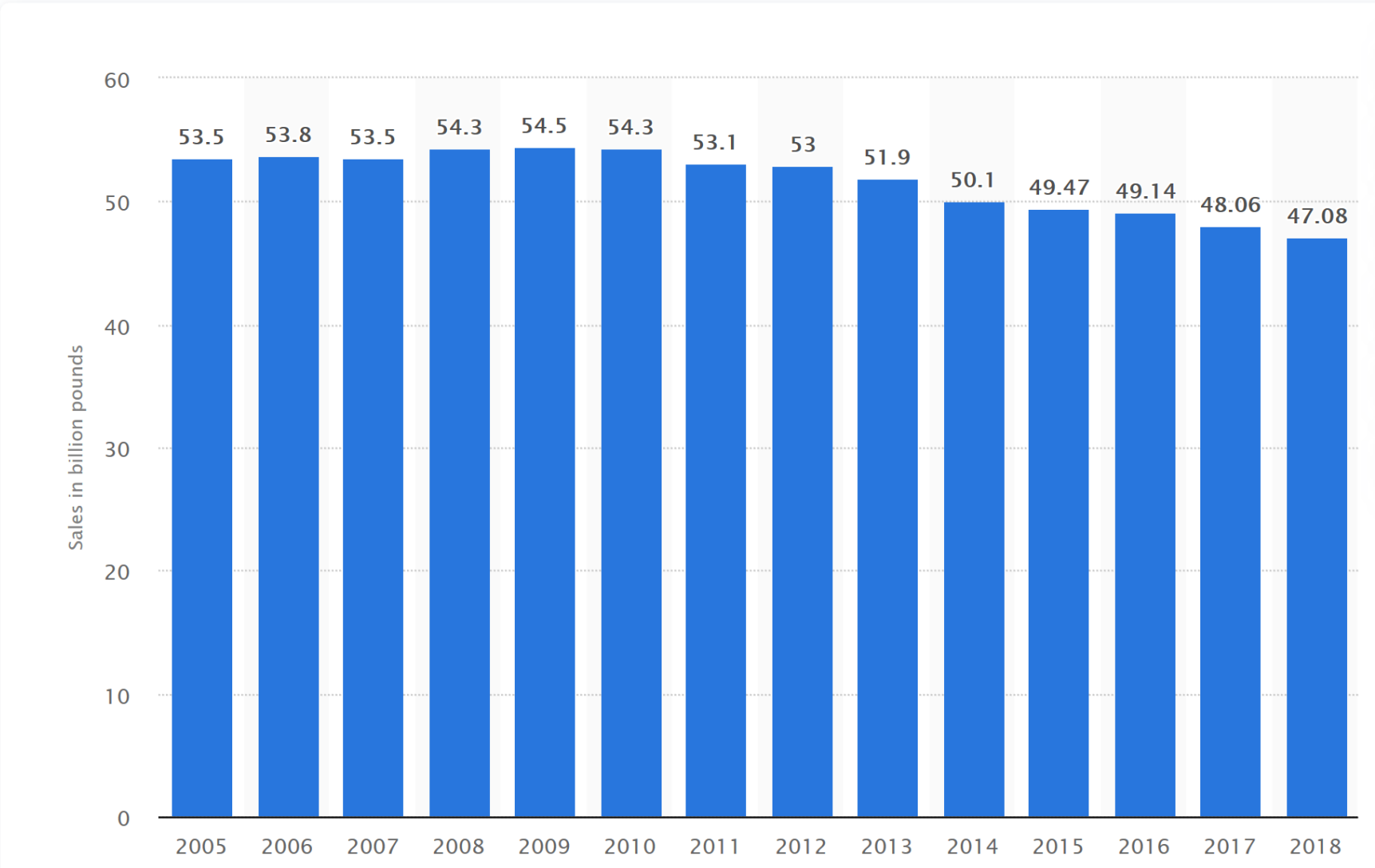
The mysterious case of America's plummeting milk consumption



Milk Life? How About Milk Destruction: The Shocking Truth About the Dairy Industry and the Environment

Milk retail sales in the United States from 2005 to 2018

(in billion pounds)

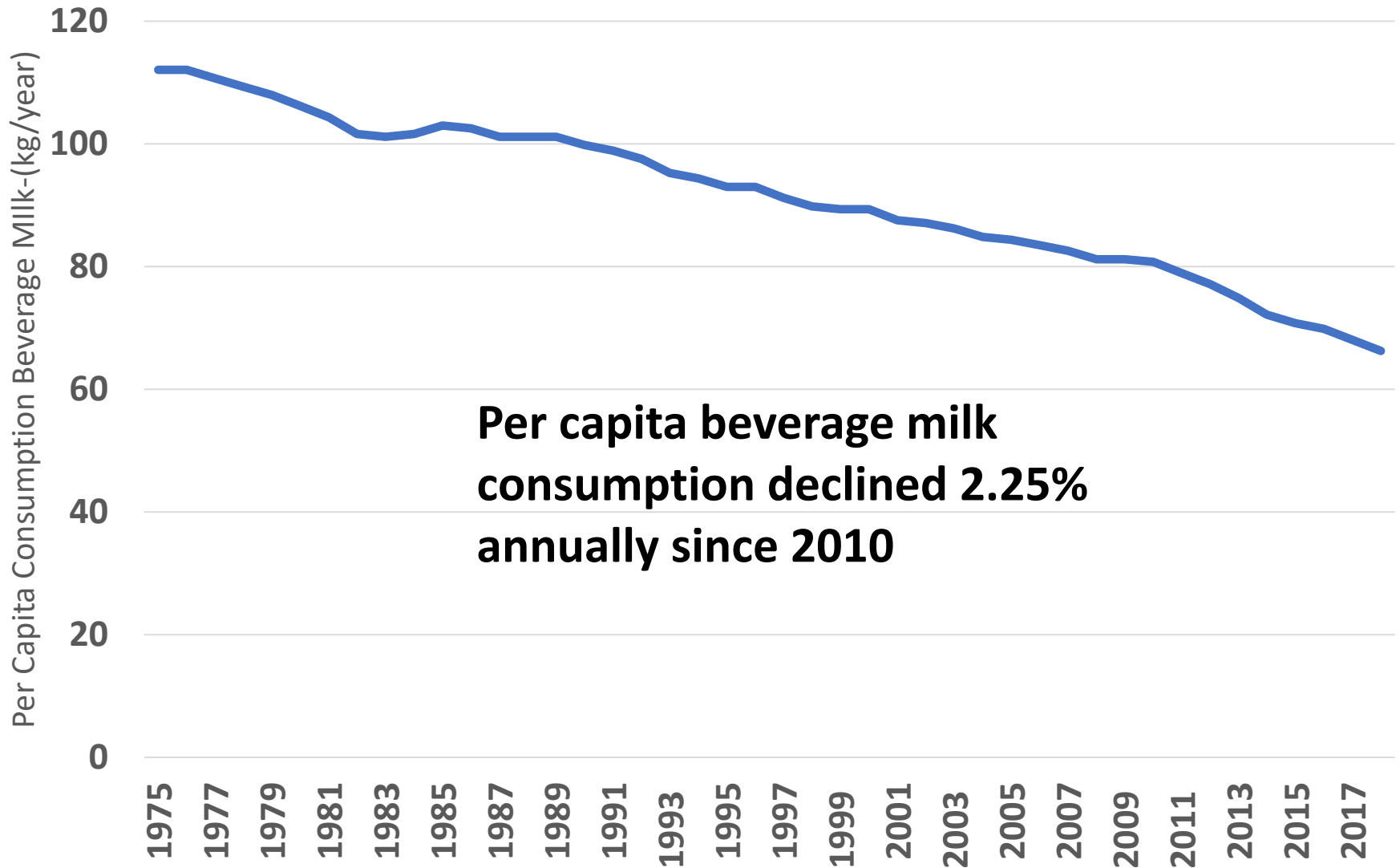


US Beverage Sales, 2018

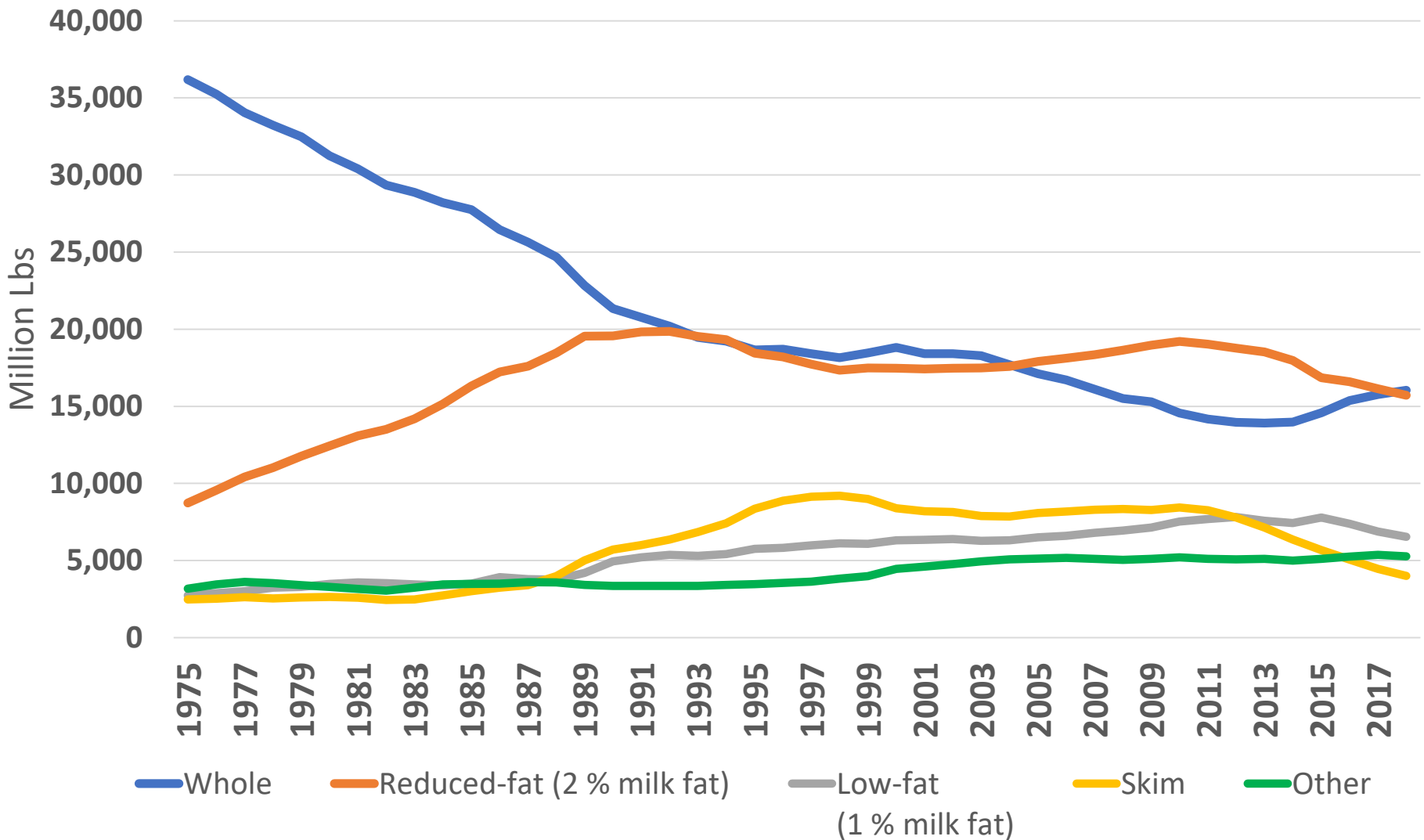
Beverage	Sales (million \$)
Almond	1,208.1
Soy	230.3
Coconut	104.5
Rice	41.7
Oat	5.5
Dairy	15,600.4

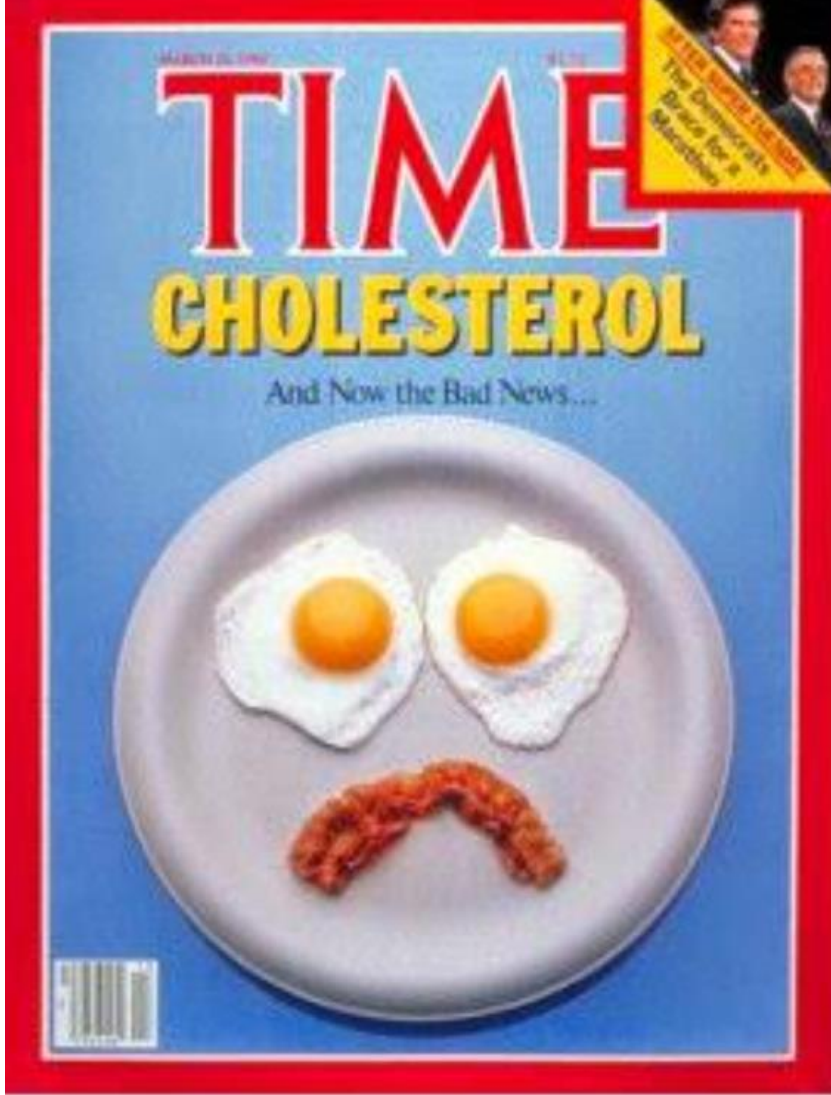
Total non-dairy \$2.11 billion

Beverage dairy milk consumption



Fluid Consumption



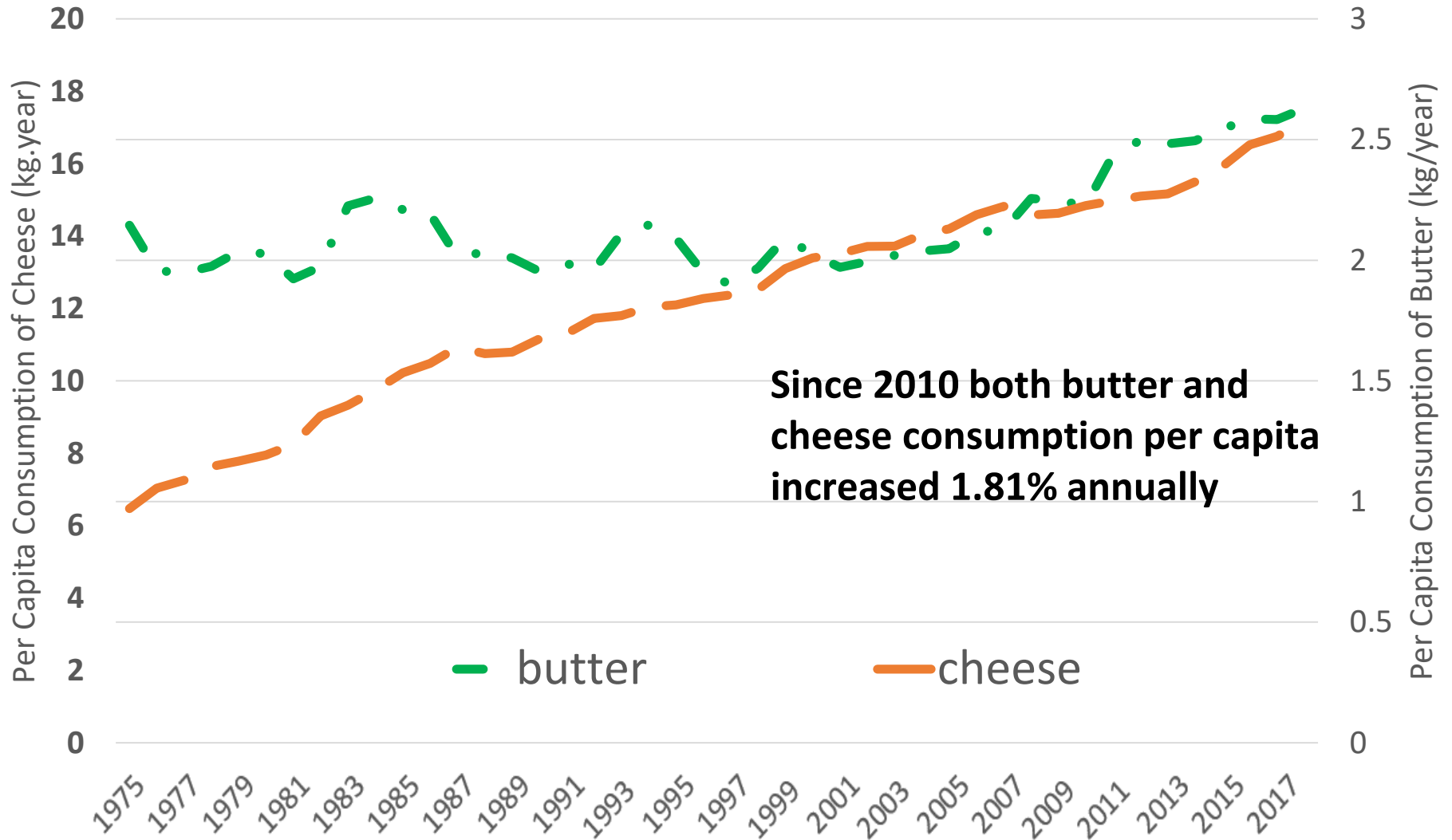


1984



2014

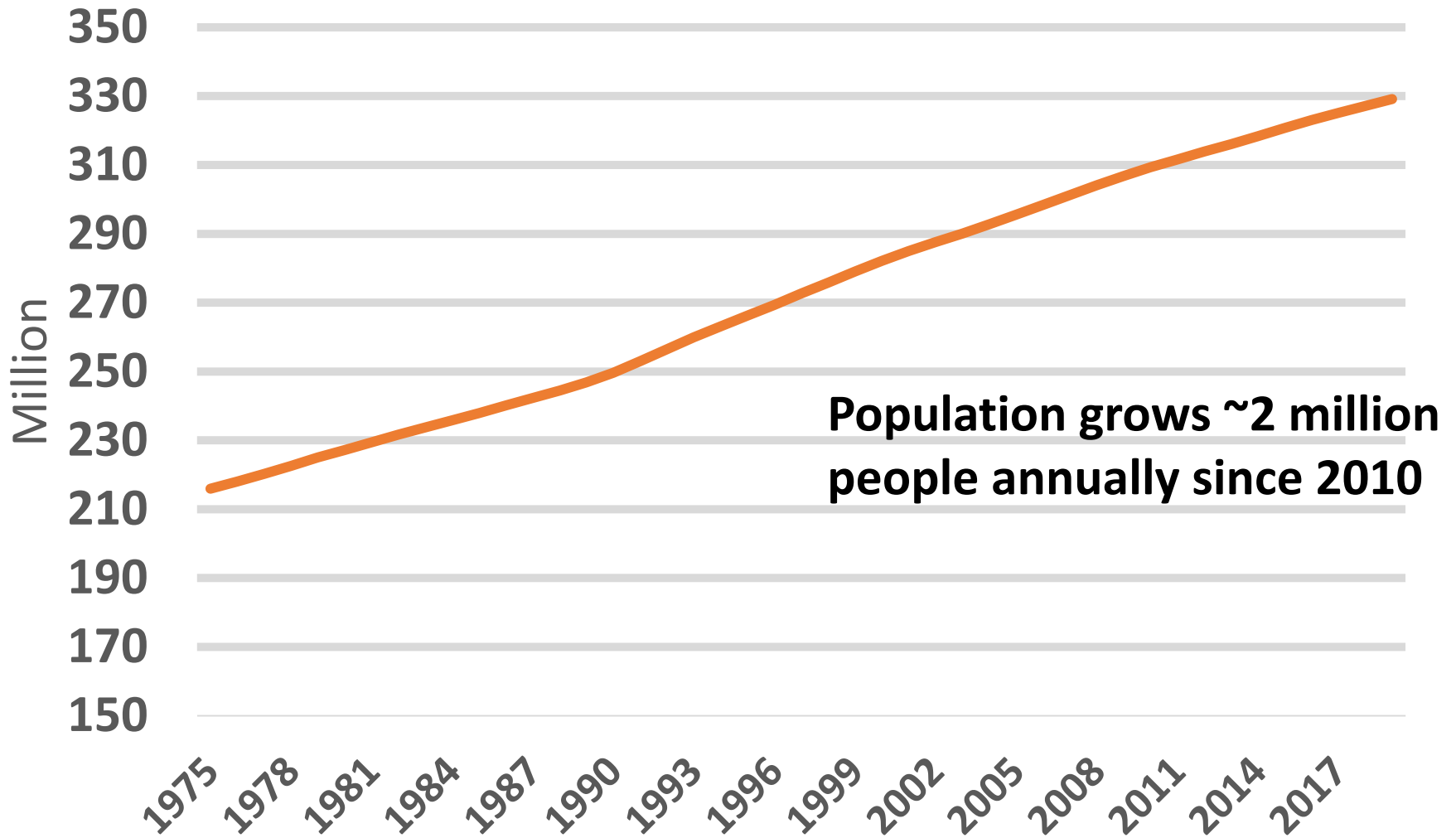
Dairy Product Consumption



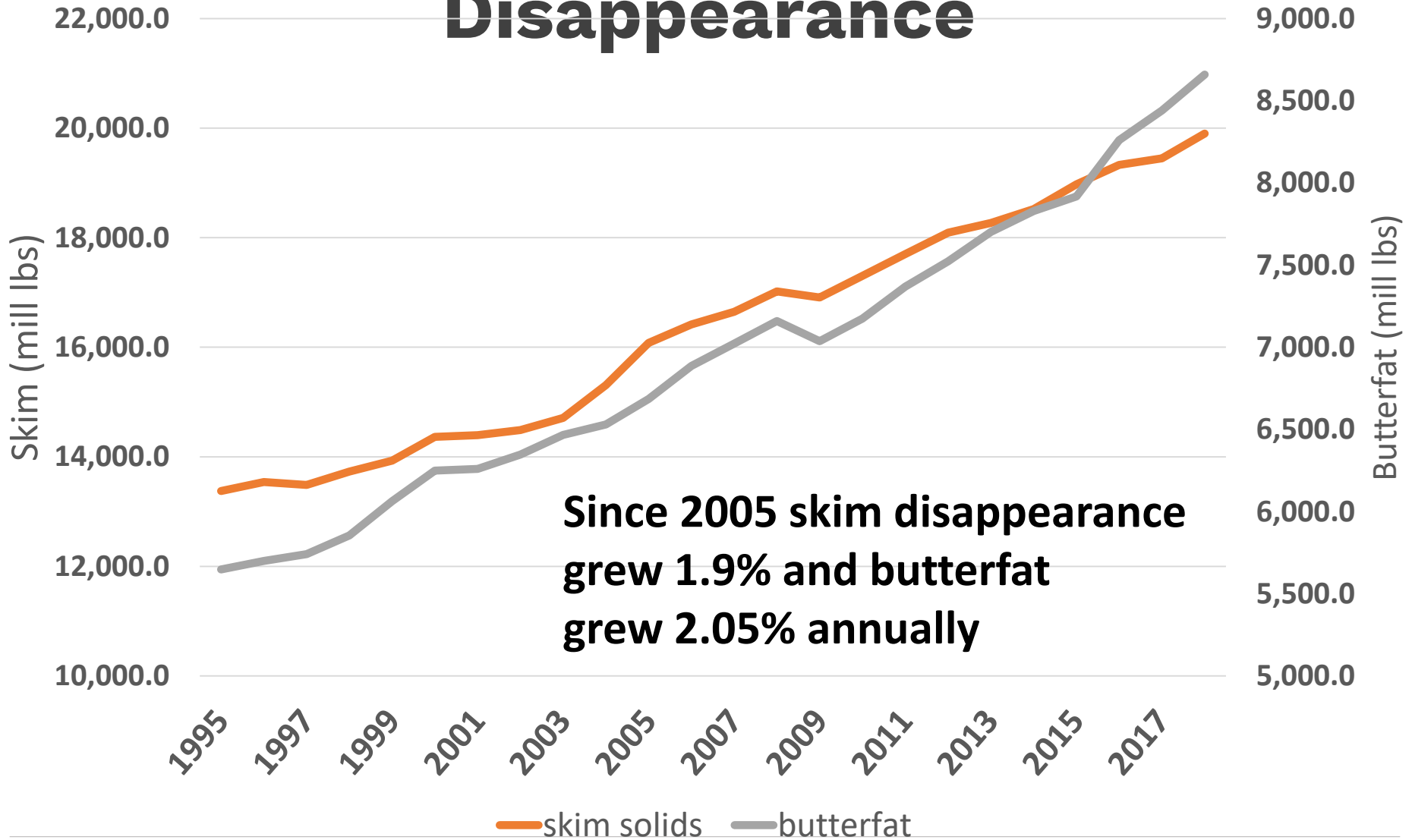
Per Capita Consumption

	Fluid milk ²	Total cheese	Butter	Yogurt	All products ³
Year	(pounds)	(pounds)	(pounds)	(pounds)	(pounds)
1975	247	14.3	4.7	2.0	539
1980	234	17.5	4.5	2.5	543
1985	227	22.5	4.9	3.9	594
1990	220	24.6	4.3	3.9	568
1995	205	26.7	4.6	6.1	570
2000	197	29.5	4.5	6.5	595
2005	186	31.3	4.5	10.3	602
2010	178	32.7	4.9	13.4	605
2011	174	33.0	5.4	13.6	602
2012	170	33.3	5.5	14.0	617
2013	165	33.4	5.5	14.9	608
2014	159	34.2	5.5	14.9	615
2015	156	35.1	5.6	14.4	630
2016	154	36.4	5.7	13.7	646
2017	150	36.9	5.7	13.7	645
2018	146	37.9	5.8	13.4	646

US Population Growth



Total Dairy Commercial Disappearance



Factors related to decline in milk consumption

- Demographics
- Increasing consumption of alternative beverages
 - Bottled water
 - Plant based beverages
- Declining breakfast cereal consumption
- Changes in school lunch program
- Environmental Perceptions
- Lactose and allergy issues

Plant Based Beverages

- Sales grew rapidly in recent years (~1/8 dairy milk sales value but with double the price)
- Labelling them as “milk” is controversial with legislation aimed to stop this practice
 - Labels bestow legitimacy and substitutability
- There are many consumer misperceptions about dairy and plant based beverages

k-Means Cluster of Milk Consumption

	Plant-Based Beverages	Rare Milk Drinkers	All-Types of Milk	Traditional Consumers
Dairy				
2% milk	3.15 (1.00)	3.06 (1.03)	1.50 (0.73)	2.16 (1.15)
Whole milk	3.10 (1.06)	3.69 (0.59)	1.82 (0.82)	2.24 (1.09)
1% milk	3.62 (0.72)	3.13 (1.02)	1.63 (0.76)	3.24 (1.01)
Skim milk	3.76 (0.48)	2.50 (1.29)	1.86 (0.77)	3.57 (0.81)
Chocolate milk	3.23 (0.88)	3.56 (0.69)	1.83 (0.83)	2.88 (0.98)
Lactose-free milk	3.71 (0.66)	3.29 (1.12)	1.94 (0.83)	3.88 (0.49)
Plant-Based				
Almond milk	1.59 (0.73)	3.18 (1.06)	1.83 (0.75)	3.55 (0.82)
Soy milk	3.14 (1.07)	3.26 (1.08)	1.81 (0.72)	3.86 (0.43)
Cashew milk	3.07 (1.00)	3.89 (0.32)	2.06 (0.90)	3.94 (0.29)
Other nut milks	2.92 (1.09)	3.86 (0.41)	2.04 (0.90)	3.94 (0.29)
Other grain milks	3.47 (0.85)	3.90 (0.34)	2.10 (0.89)	3.95 (0.28)
Percent of sample	13.3	20.8	7.8	58.1

Likelihood to substitute plant-based for dairy milk

	Plant-based Drinkers	Rare Drinkers	All-Types of Milk	Traditional Consumers
As a beverage	2.36	3.87	2.10	3.97
On your cereal	2.01	3.46	1.98	3.83
For your children	2.40	3.76	2.15	3.95
For your pets	3.40	4.28	2.48	4.51
In coffee or tea	2.50	3.62	2.10	3.96
As an ingredient	2.38	3.57	2.13	3.62
In a smoothie	1.88	3.41	1.93	3.58
In a dessert	2.28	3.57	2.11	3.64

Consumer Segments

Segment	Age	Gender	Kids	Income
Plant-Based	Young	More Female	Some kids	High
Rare	Oldest		Least kids	High
All-Types	Young	More Male	Some kids	
Traditional	Older		Most kids	

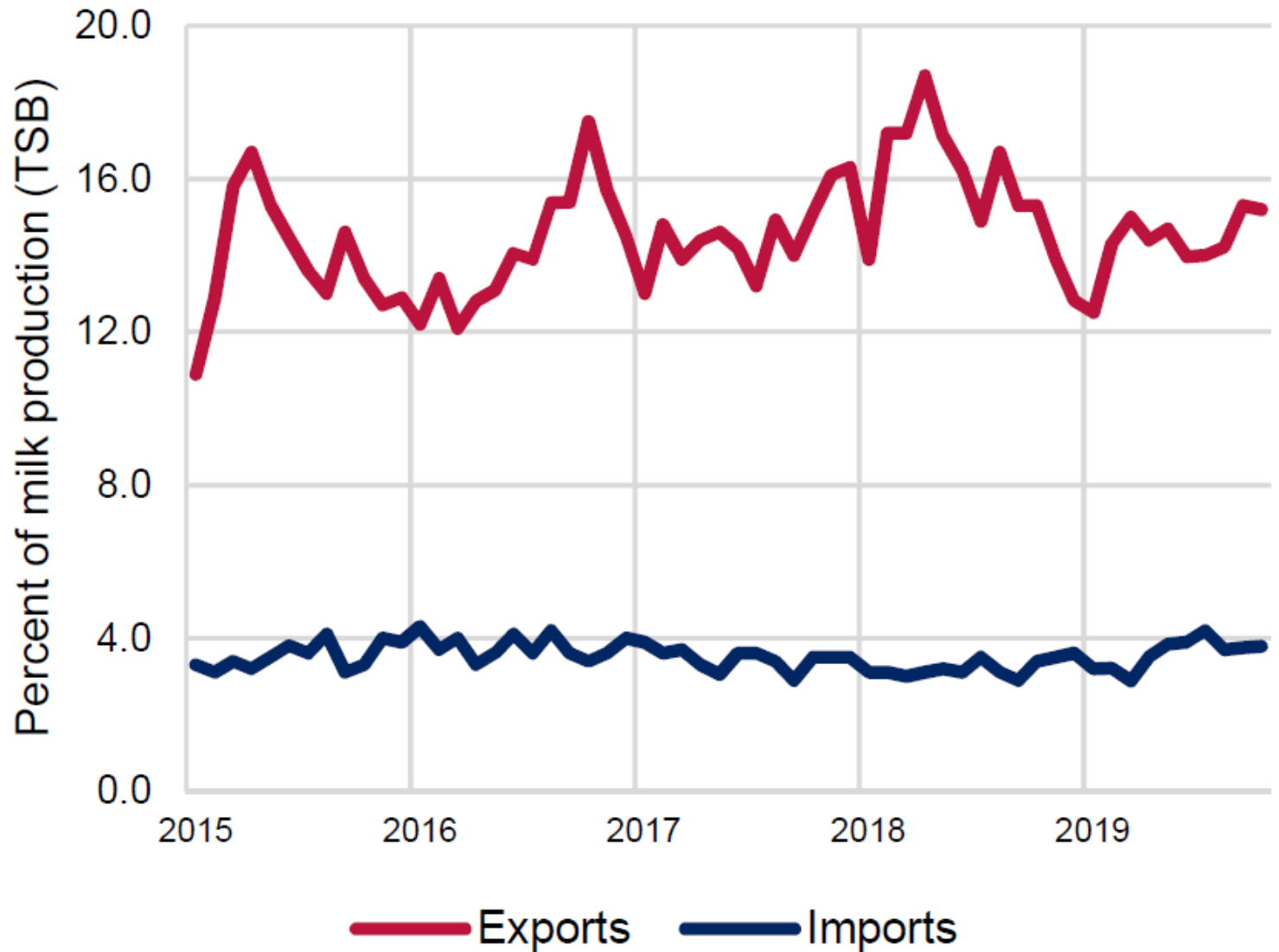
Milk Labels

- Clear that misinformation and perceptions are correlated with some milk choices
- Are labels the issue?
 - Legislation to preserve “milk” for dairy

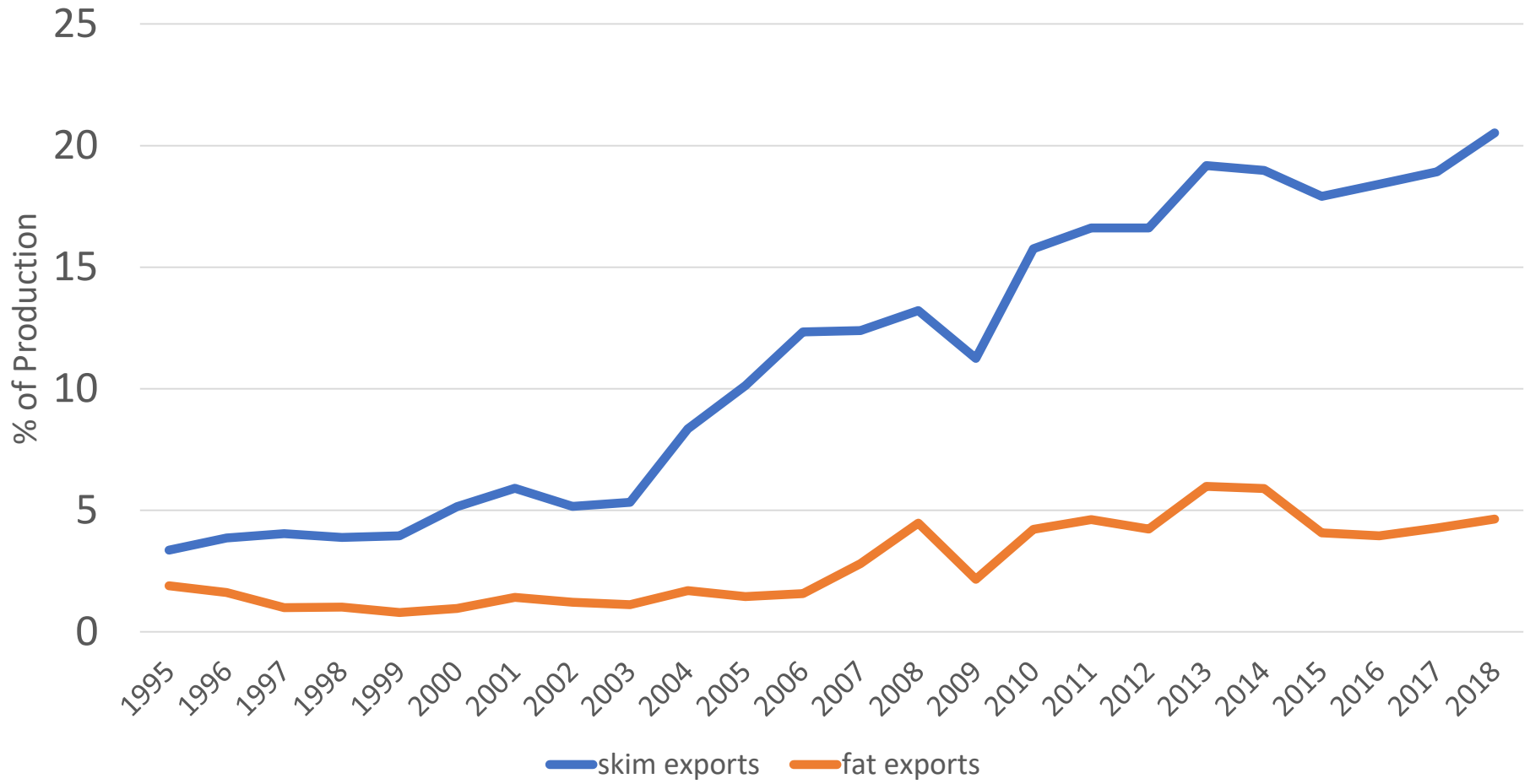
Implications

- Not clear that label rules will solve consumption issues for dairy
- Dairy must compete for beverage consumption by meeting needs
- Is the Federal Milk Marketing Order model the best for producers and consumers?
 - Based on inelastic demand for fluid milk
 - Charge more for fluid (less Q consumed) and less for manufactured products (more Q consumed)

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



Percent of US Milk Solids Exported



Impacts of Increased US Dairy Exports

- Exports support production growth
 - US has a home for excess snf/milk proteins resulting in higher dairy revenues in aggregate
- Exports can result in more price volatility
 - US dairy product prices are highly correlated with world prices which also means higher price volatility in some periods
 - Make markets vulnerable to political disagreements

Results of Increased Exports

US dairy product prices highly correlated with world prices for products exported

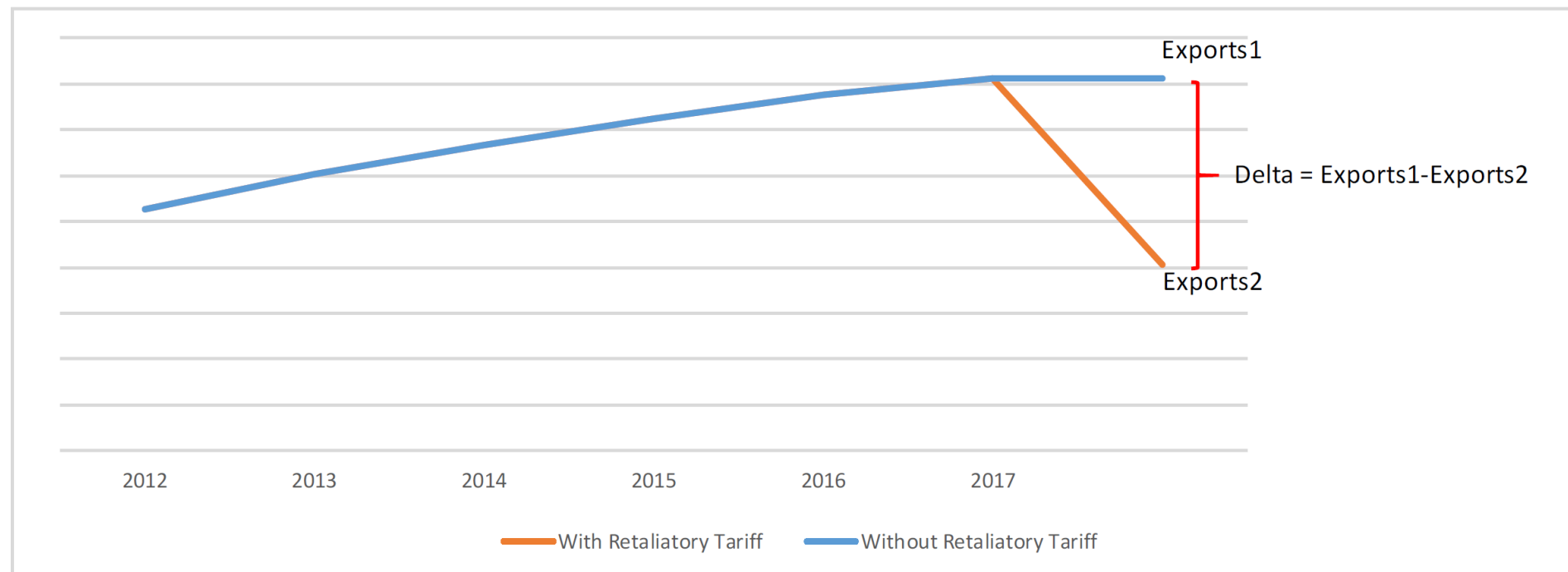
- Dry whey 94%
- SMP/NDM 93%
- Butter 48%
- Cheddar 78%

Dairy Trade Issues

- USMCA – NAFTA 2.0—APPROVED THIS WEEK
 - Expanded access to Canada—3.25 to 3.59%
 - Eliminate class 7 and 8 in Canada
- China
 - Tariffs—phase 1 trade deal
 - African Swine Fever— how many pigs will be culled? 40%? Equates to 24% of world swine herd
 - 175(?) million pigs culled so far; pork prices up 110% in China
 - Decline in soybean and lactose exports to China
 - Up to 150,000 metric tons lactose-equiv demand lost
- Japan – new free trade agreement

Estimating Trade Damage

Figure 1: Value of U.S. exports to retaliatory partner with and without the retaliatory tariff



US Response to Trade Wars

- Market Facilitation Payments:
 - Round 1 in 2018: \$8.59 billion total -- \$180 million to dairy producers
 - Round 2 in 2019: up to \$14.5 billion total -- \$351-371 million to dairy producers
 - Dairy-related payments represents 2.4-2.6% of 2019 MFP; in 2018 dairy received 2.1% of all trade assistance dollars.
- MFP is part of a broader USDA effort to help producers whose commodities have been directly impacted by tariffs. Other USDA programs include:
 - The [Food Purchase and Distribution Program](#) will purchase affected commodities.
 - And the [Trade Promotion Program](#) attempts to restore lost markets and develop new export markets for farm products.
 - \$300 million total—USDEC \$7.8 million

China “Phase One” Dairy Implications

- US Dairy Exports to China

2017 \$576million 2018 \$499million 2019 \$343million (Nov)

- China committed to streamline timelines/procedures for U.S. facilities and products and to provide regulatory certainty and market stability for products.
- Dairy and infant formula commitments could result in an additional \$250-300 million in annual dairy and infant formula exports above current levels.
- China agrees not to undermine US product access with Geographic Indicators (EU)
- IDFA estimates China represents a \$23 billion market opportunity for U.S. dairy over next decade

Cornell Dairy Farm Business Analysis Summary

	2012	2013	2014	2015	2016	2017	2018
Profitability				%			
ROA	6.1	7.9	14.1	1.2	1.3	3.6	1.3
Solvency				%			
D/A	32	31	28	31	33	34	36
Liquidity				ratio			
CR	2.46	2.49	3.01	2.42	2.15	2.11	NA

Source: Jason Karszes

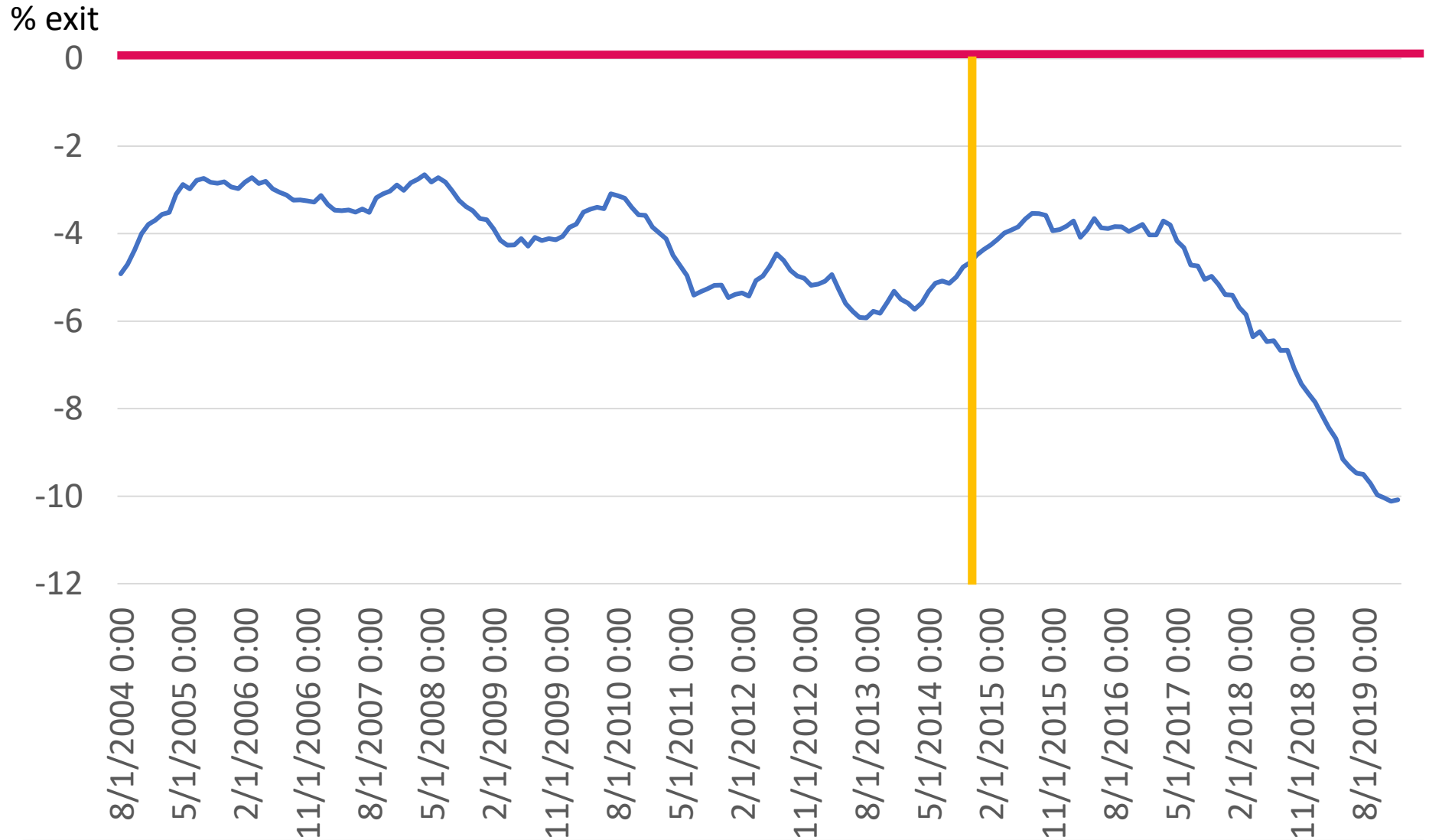


Stressed Dairy Farm Profit Margins Past 5 Years

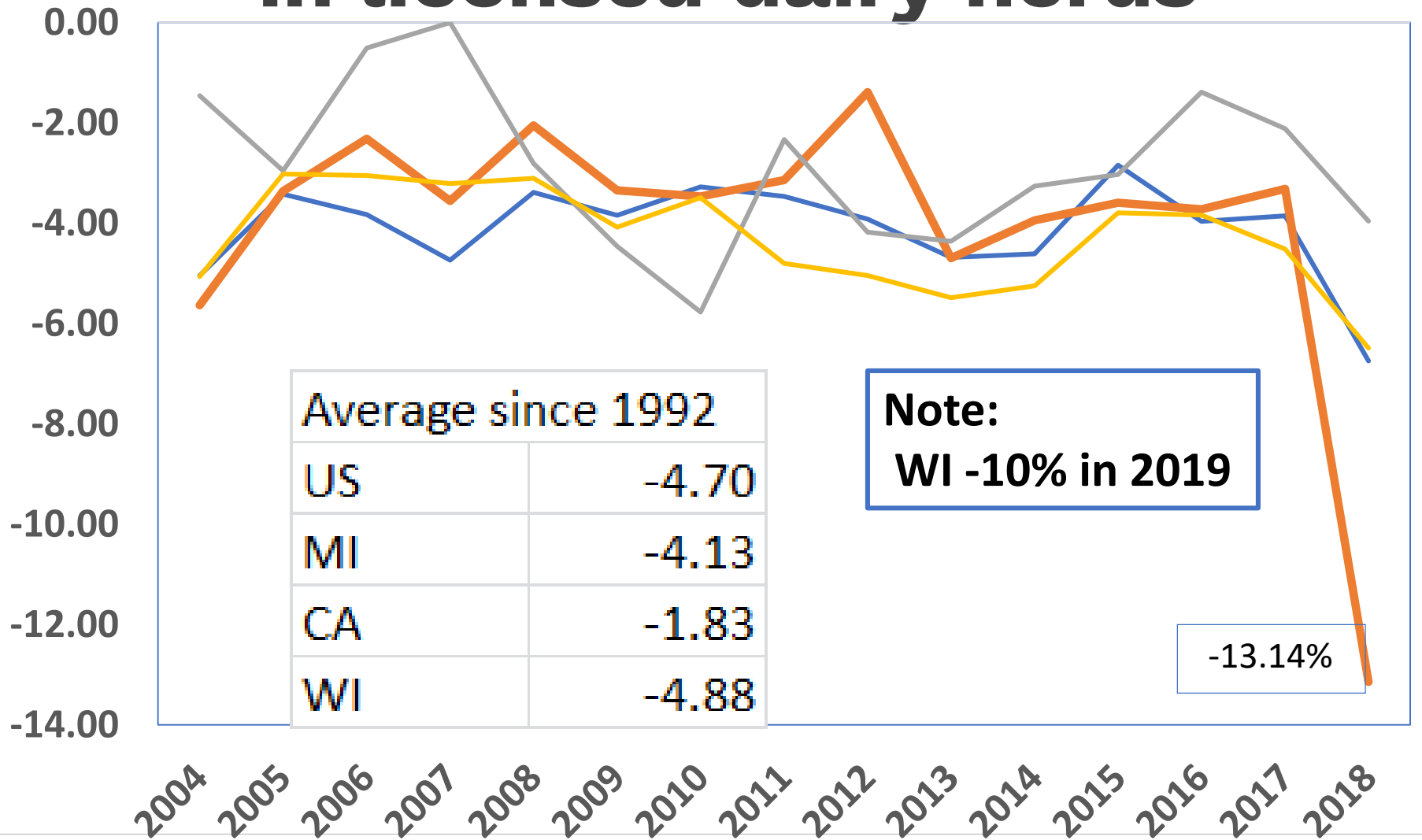
Two issues

- Low farm milk prices relative to costs and trade issues affecting prices
- Balancing capacity and market adjustment charges in many states and regions

Wisconsin dairy farm exit rate



Annual percent decline in licensed dairy herds

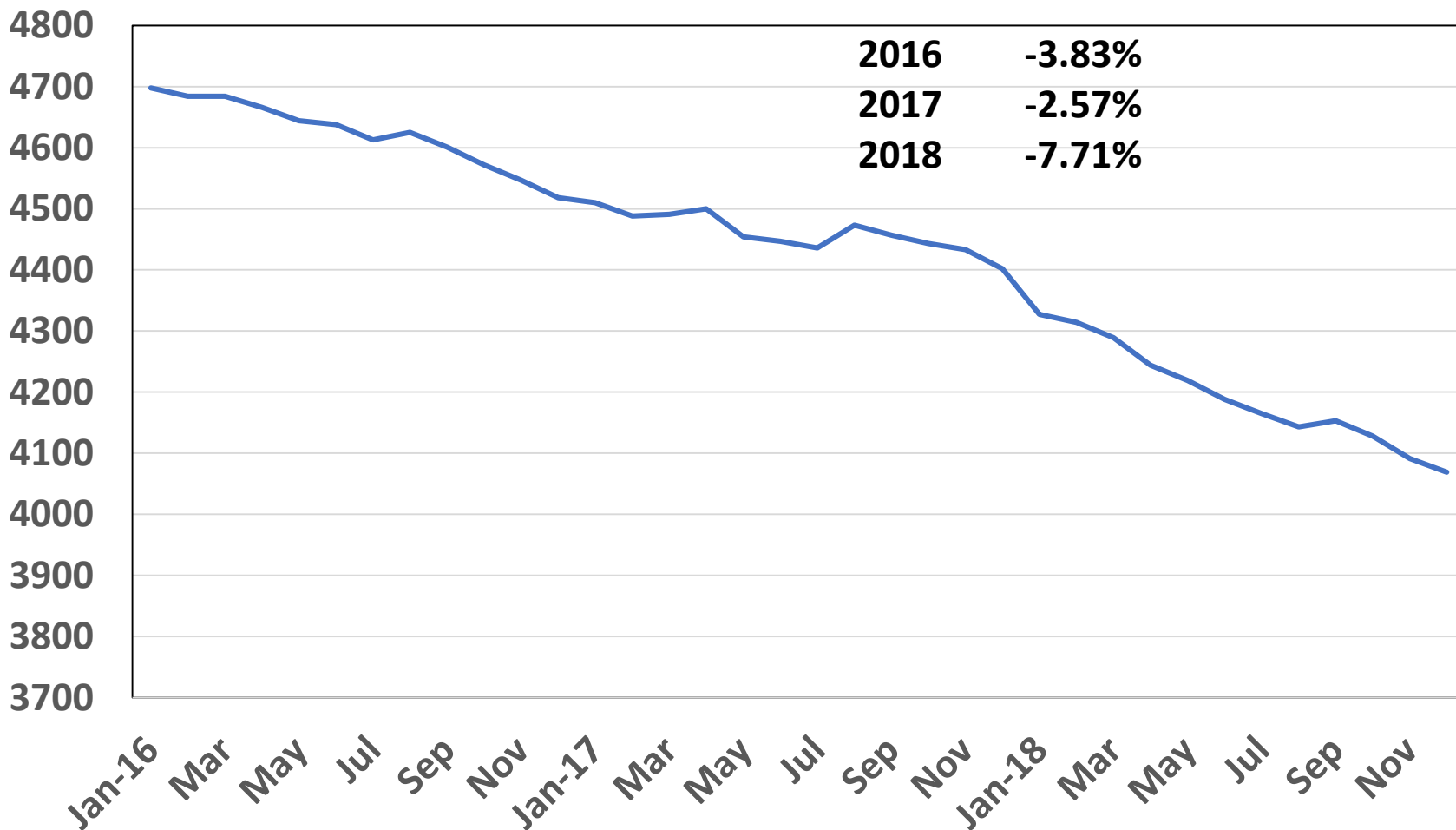


Average since 1992	
US	-4.70
MI	-4.13
CA	-1.83
WI	-4.88

Note:
WI -10% in 2019

-13.14%

New York Herds



US Dairy Herd Structure, 2017 Ag Census

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

Milk Market Coordination Challenges

- Seasonal Balancing
 - Milk production peaks in the Spring and is lower in the Fall
 - Fluid milk demand peaks in the Spring, cheese and butter demand peaks in late fall or early winter
 - Must manufacture cheese and butter for holidays in earlier months
 - Consequently milk prices tend to rise in September and fall in the Winter

Milk Marketing Coordination Challenges

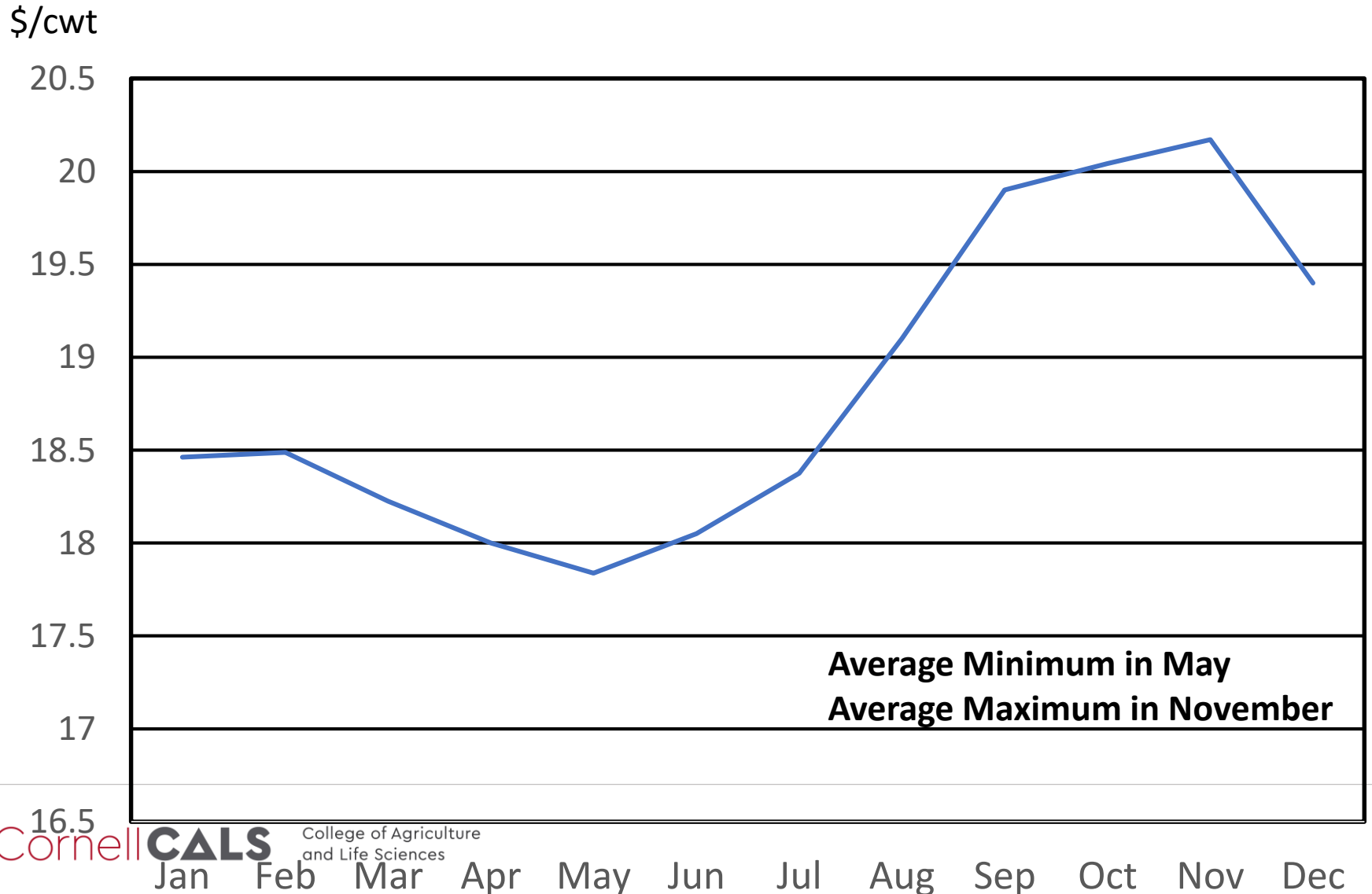
- Daily Balancing
 - At any given time, cows produce about the same amount of milk from day to day
 - People do not purchase dairy products with the same consistency
 - Grocery store purchases are higher on the weekend and sales and holidays also affect store sales and consumption patterns
 - Some events are predictable—kids back to school—and some are not—snowstorms, flooding and plant closures
-

Milk Market Challenges

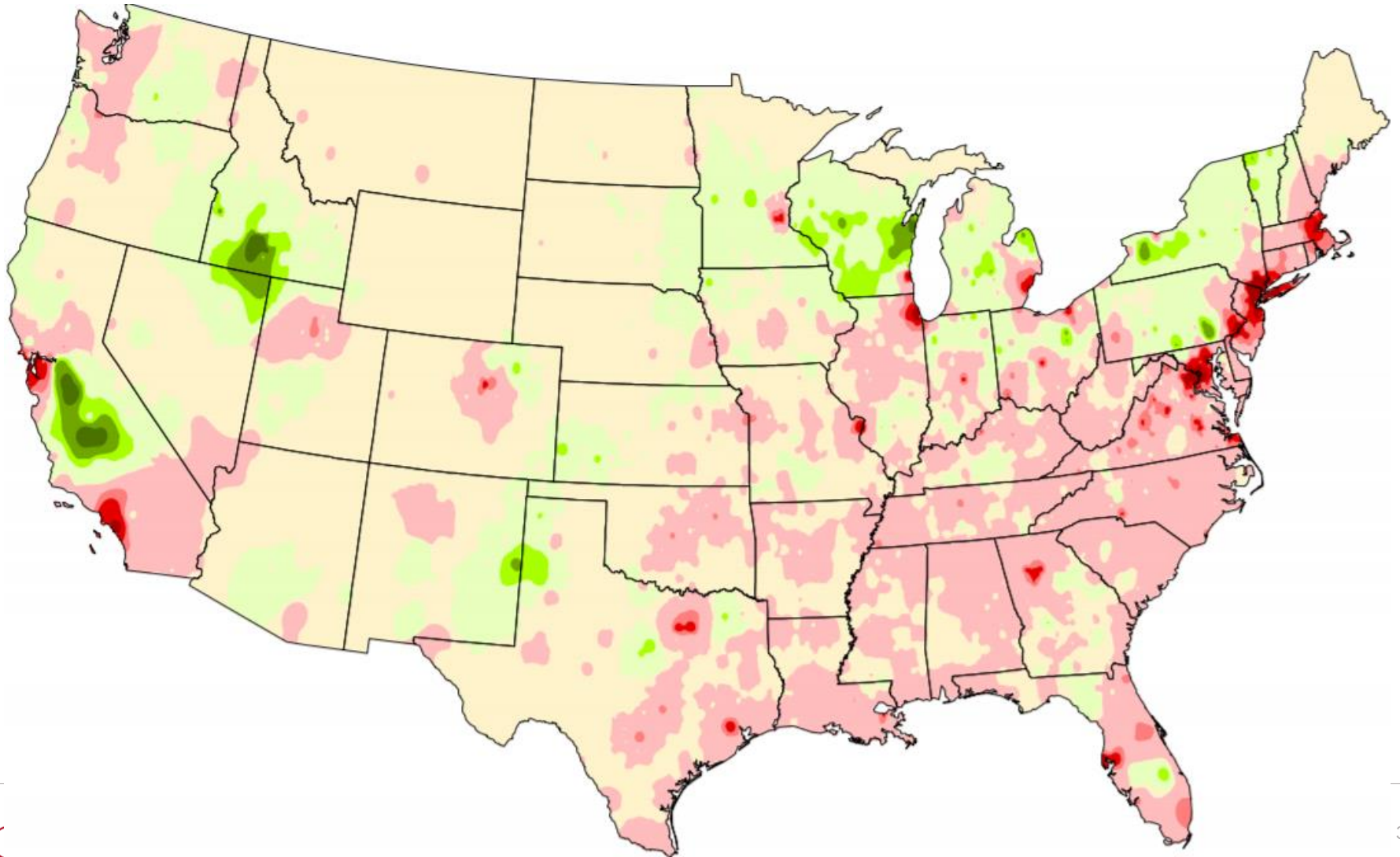
- Cyclical Balancing – there appears to be a somewhat regular 3-year cycle of rising and falling prices corresponding to the changing levels of excess supply
- Each of these creates a coordination challenge

Do we still have seasonal price effects?

Average Monthly US All Milk Price 2010-17



Surplus/Deficit Milk Production Areas



Source: Mark Stephenson

Compensation for Balancing

- All producers benefit when excess milk production is converted to storable products as that milk is not competing for fluid and other markets
- PPD from FMMO is minimum share of pool value for these activities
- Cooperatives also negotiate over-order premiums and sharing to compensate for balancing activities

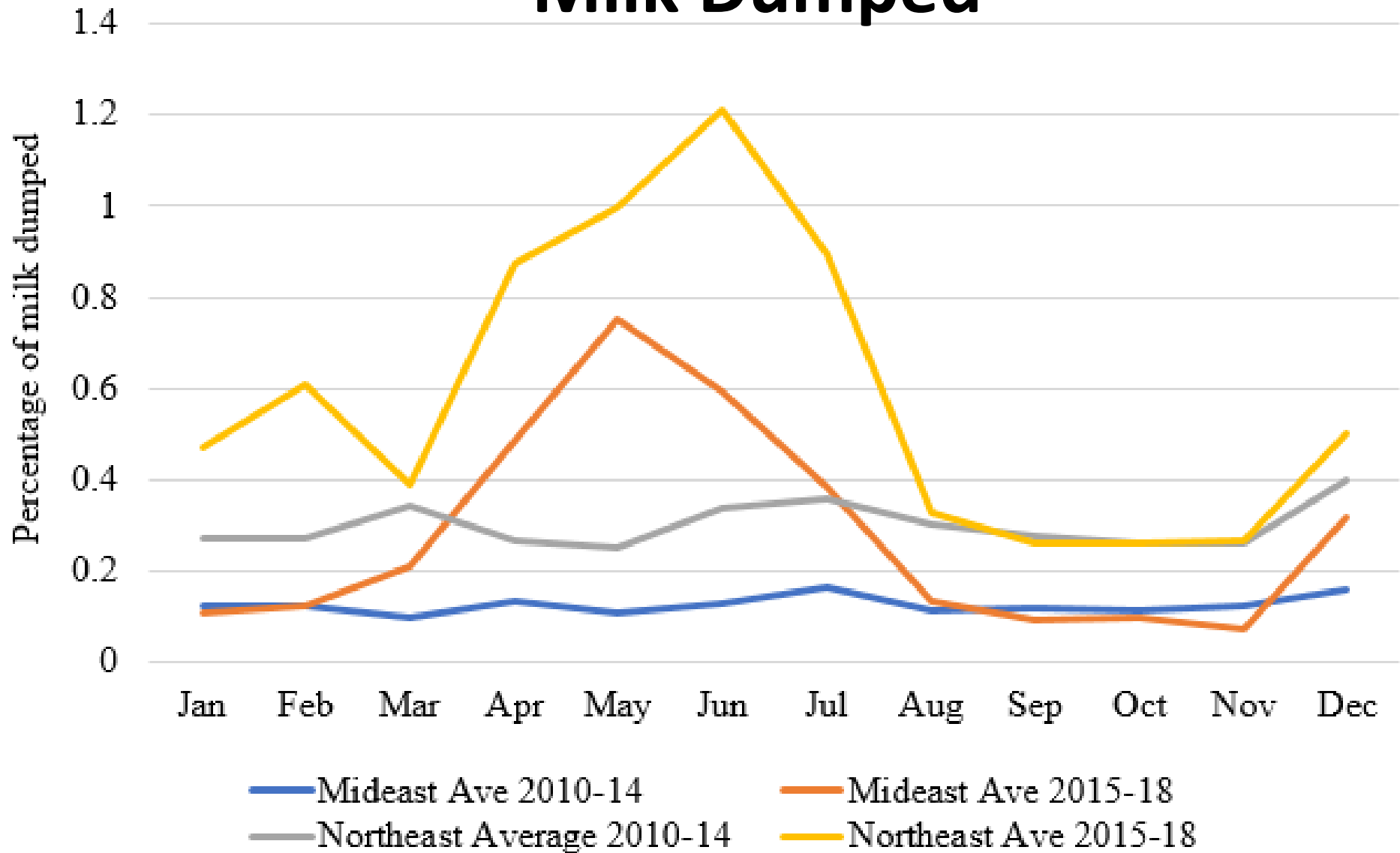
Excess Milk Production

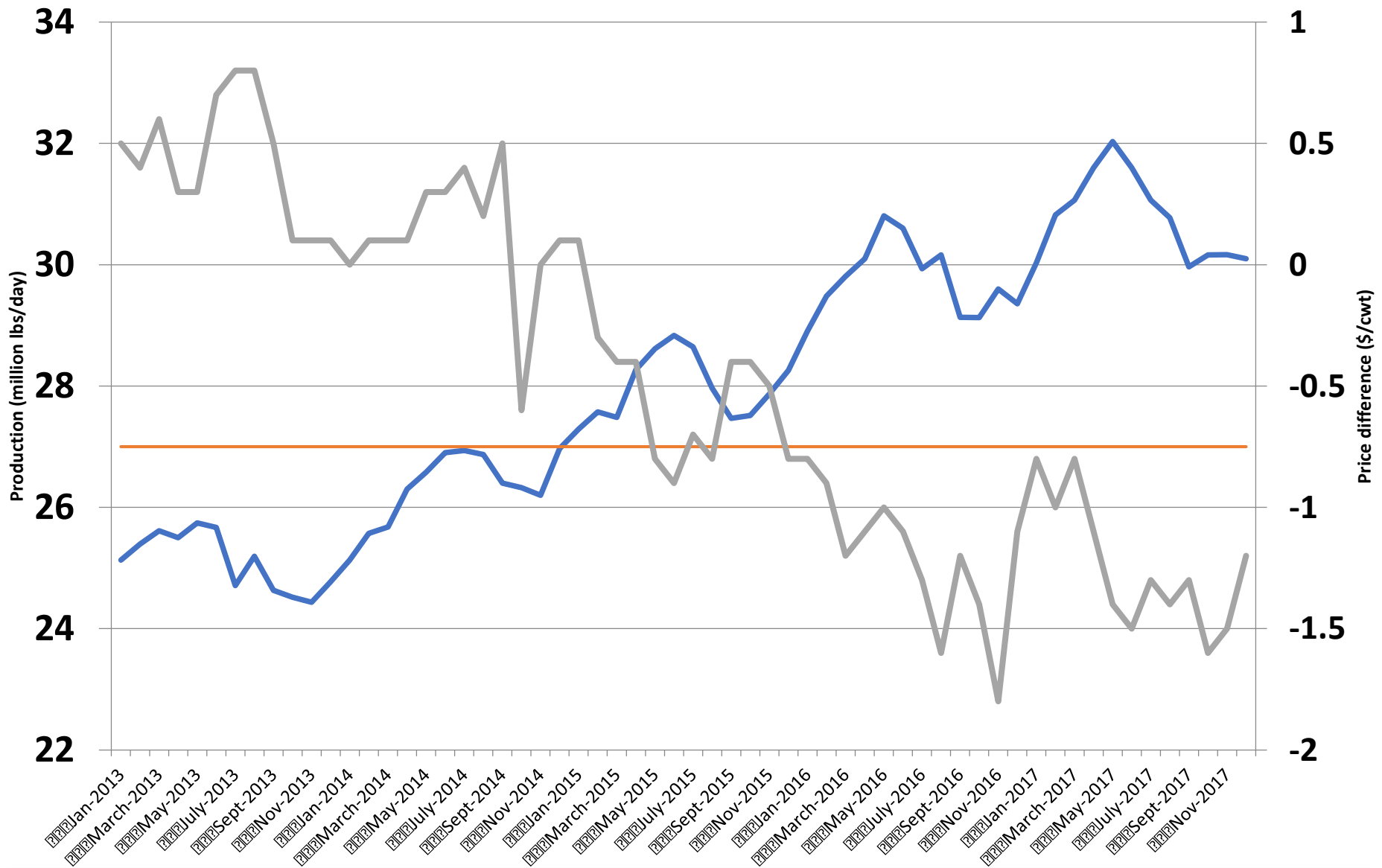
- When milk supply is long or does not make it to a plant there are two possibilities:
 - Distressed milk sales: sold at a deep discount
 - Dumped milk

Dumped Milk

- 0.2 to 0.4% of milk produced does not make it to the plant or is rejected because it is contaminated or spoiled.
 - Plant issues (breakdowns, maintenance) can result in spoiled and dumped milk
- 0 to 2% of milk is sometimes dumped for lack of a market.
 - May not leave the farm.

Milk Dumped





Coop Base Plans

- Charge milk production growth to dispose of excess milk is applicable
- Not having a base plan is having a plan where all milk pays excess balancing costs

Implications of Structural Change

- Market access continues to be a challenge
- Balancing issues in some regions
- Rural communities feel impact of farm exits (even if cow numbers are stable)

Policy Issues for 2020

- Trade agreements and implementation
- DMC and DRP
- FMMO's

Thank You

Christopher Wolf
cwolf@cornell.edu