The cost of cage-free transition and Proposition 12 to producers and consumers

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11th Annual Egg Industry Issues Forum.
April 16-17, 2019.
Kansas City, MO

Introduction

- Cage-free pledges trends and costs
- Proposition 12 costs
- Estimations are based on many assumptions
- High variability between companies, location, etc.

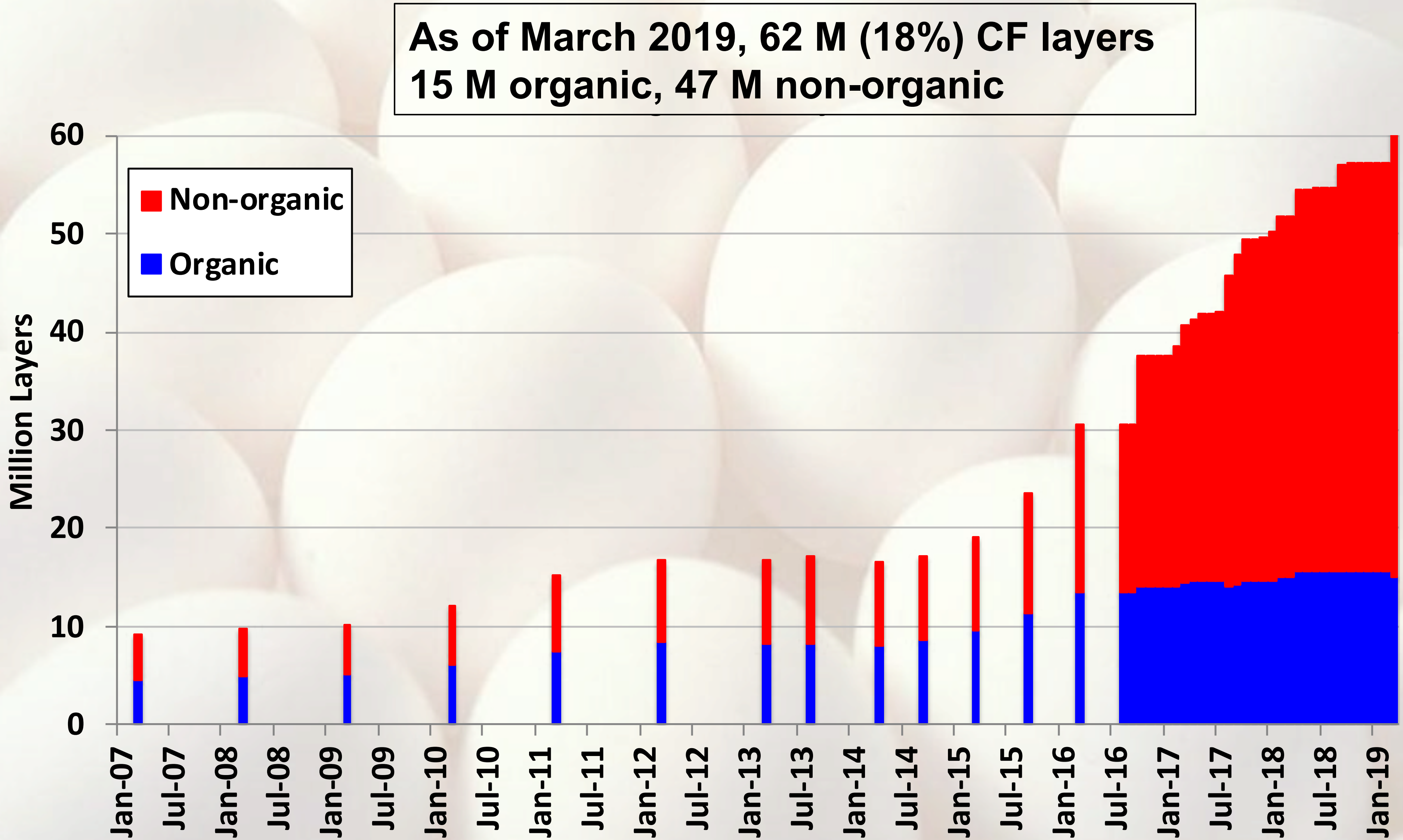
U.S. Layer Housing Situation

- Starting in late 2015, many restaurant chains and retailers announced they would go to 100% cage-free by certain year (e.g., 2020 or 2025).

- Some egg producers announced they would go to 100% cage-free.

- A total of 223 million cage-free layers will be needed by 2026 to supply the customer's companies that have pledged to go cage-free.

U.S. Cage-Free Trend (million layers)



Source: USDA AMS

U.S. Cage-Free Trend (million layers)

- CF layers increased by 31.4 million in the last 3 years (almost everything built was cage-free)
- Rate of conversion needed to meet 223 M CF layers by 2026:
  - 30.6 M CF layers/year for next 7 consecutive years (nearly 3 times as fast as last 3 years)

Cage-free Production Concerns

Cage-free production so far is more inefficient in the use of resources. Higher mortality which results in less eggs/hen housed, worse feed conversion, more labor, disease, etc. On top of having higher capital costs.

Research is needed to solve (or reduce) some of these problems.

	Conventional	Aviary	Difference (%)	Difference ($)
Pullet cost ($/pullet)	4.48	6.33	41%	1.85
Capital cost ($/hen housed)	15.14	39.39	160%	24.25
Cummulative mortality (%)	4.7%	11.7%	152%	
Eggs per Hen Housed (dozen)	30.20	28.60	-5%	-1.60
Feed Conversion (lbs./dozen)	3.13	3.23	3%	0.10

Source: Coalition for Sustainable Egg Supply (CSES)

Cage-free Investment Concern

Estimated cost of building still needed to comply with all CF pledges: $9.5B if discounting the 62 M CF layers in 2019 (Approximately $1.4 B/yr.)

Developing a new site adds more than 25% to the cost

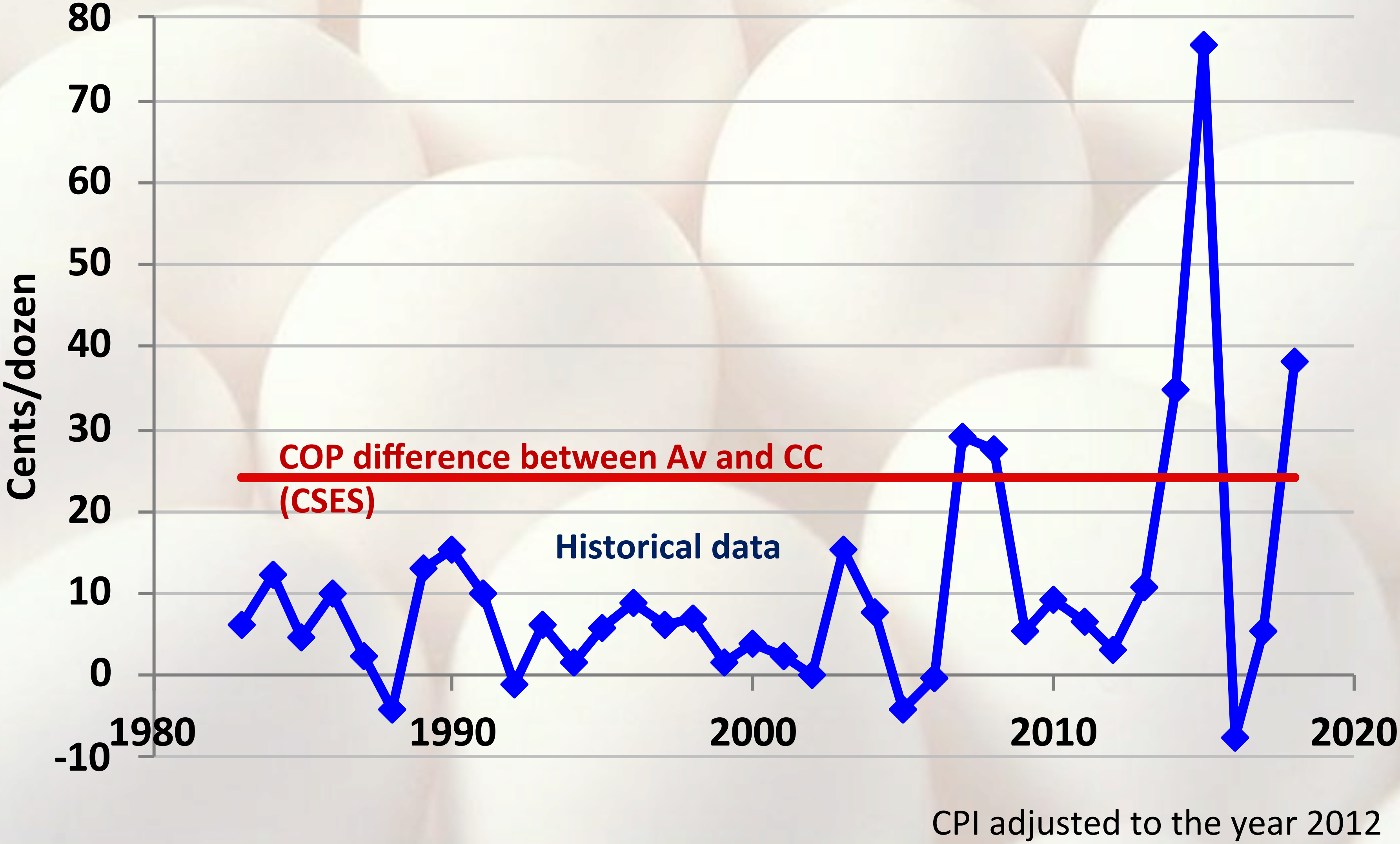
But this investment is needed to go to a more costly way of producing (both higher capital costs and operating cost)

Cost (cents/dozen)	Conventional	Aviary	Difference (%)	Difference (¢)
Feed cost	42.5	43.6	3%	1.1
Pullet cost	14.8	22.1	49%	7.3
Labor cost	1.9	7.4	289%	5.5
Energy cost	1.4	1.5	7%	0.1
Miscellaneous cost	0.5	0.5	0%	0.0
Capital cost	5.8	16.2	179%	10.4
TOTAL cost	**67.0**	**91.3**	**36%**	**24.3**

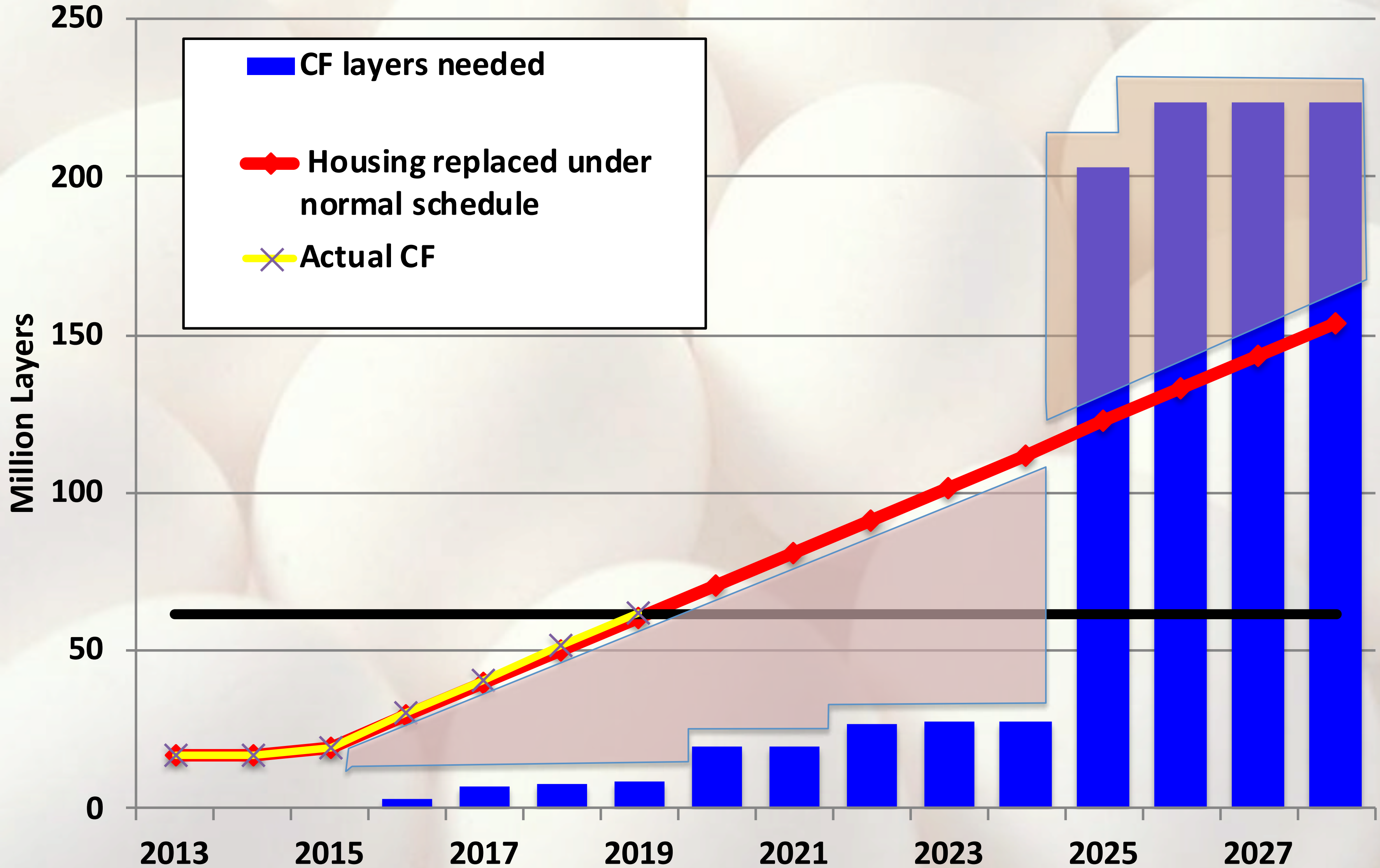
Operating
13.9

Source: Coalition for Sustainable Egg Supply (CSES)

Historical Data of CPI adjusted (Nest Run Egg Price – COP) vs. Difference in COP between CF (AH) and CC from CSES Study

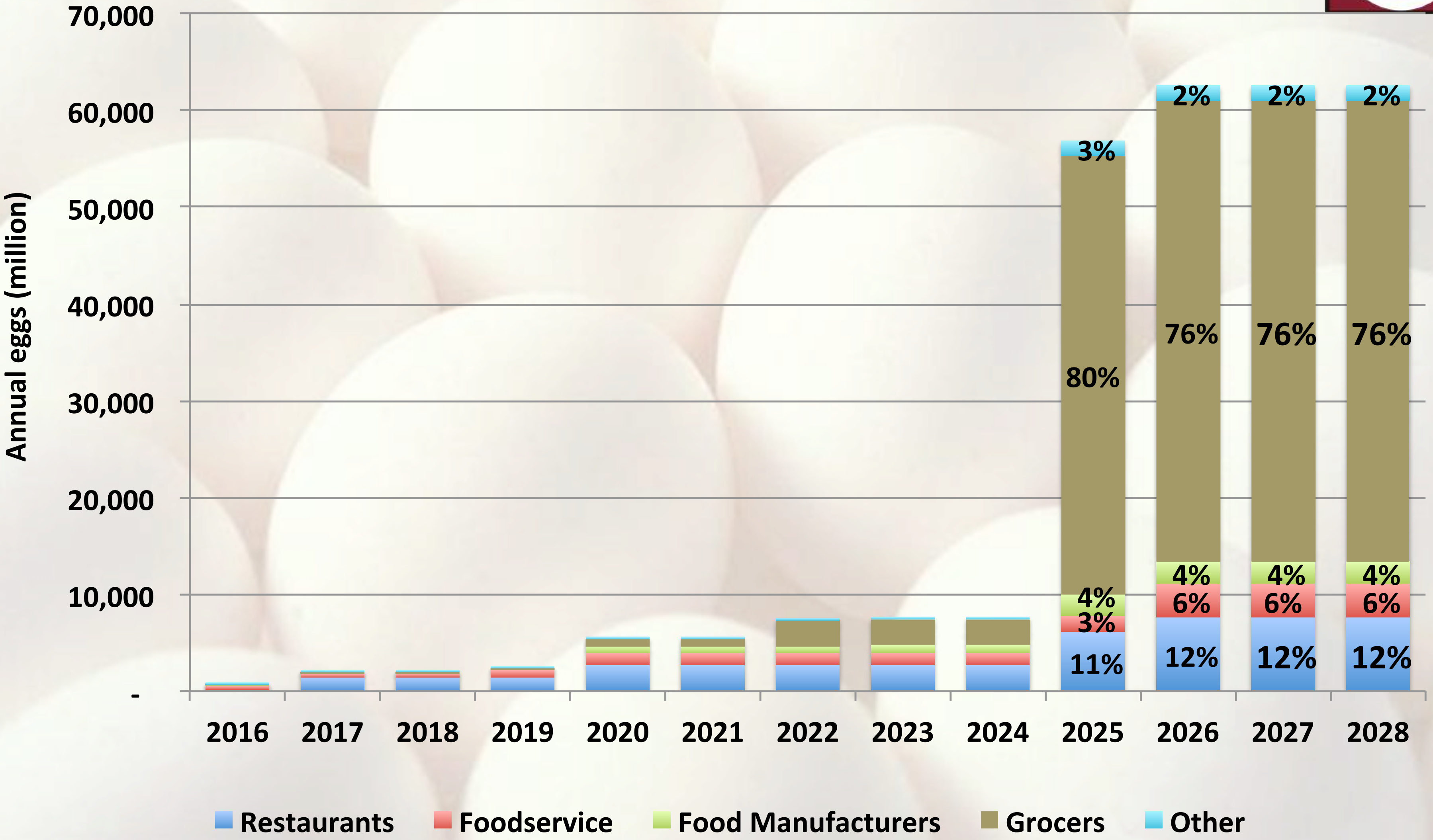


Cage-free layers needed to supply restaurants, foodservice and grocers pledging to use only cage-free eggs



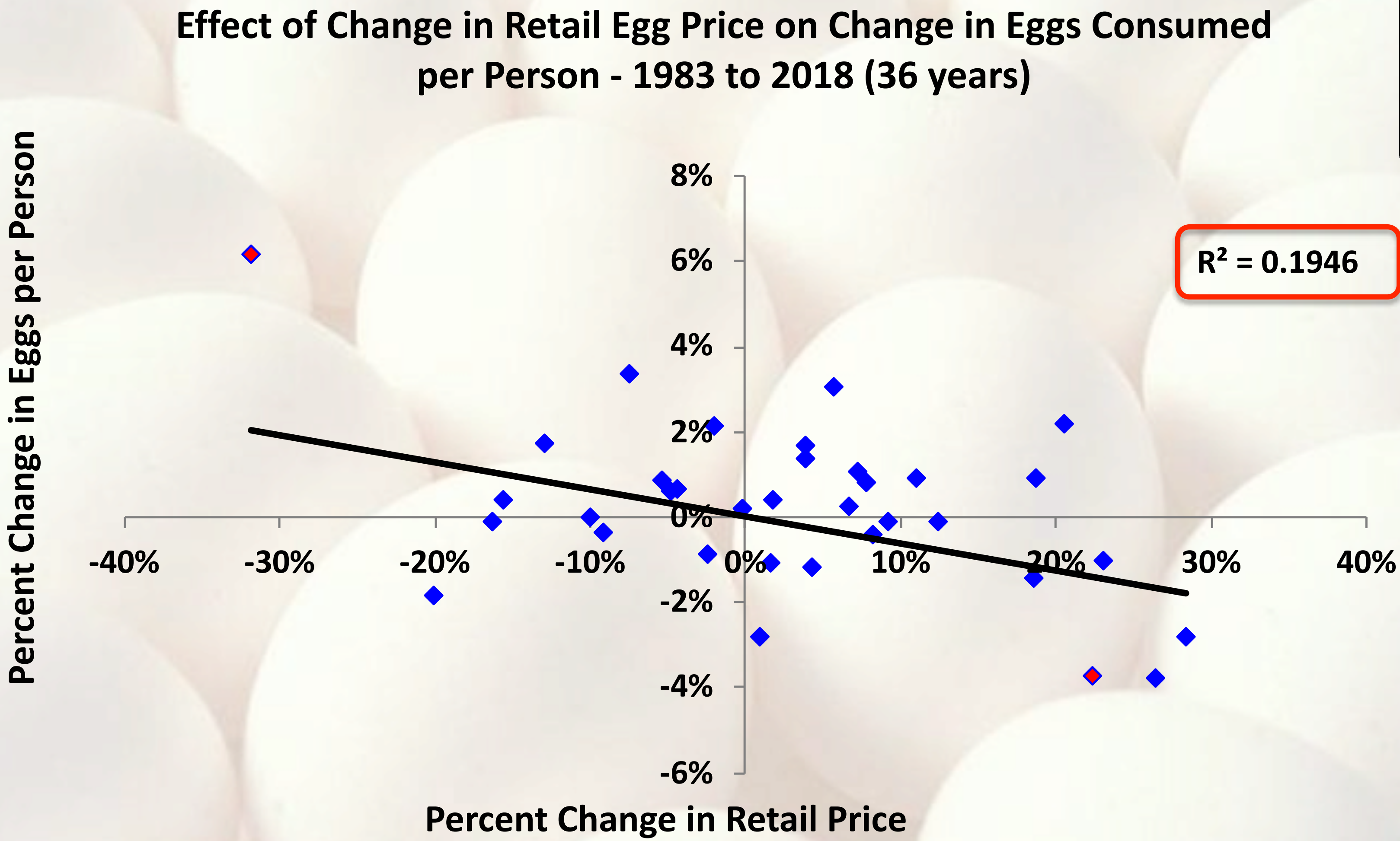
Data Sources: USDA and United Egg Producers and USDA NASS

Cage-free eggs needed to supply to customers pledging to use only cage-free eggs



Retailers represent the majority of the CF pledges

Smaller size and checks eggs (demand from non-grocers)



NOT THE SAME AS IN-STORE DECISIONS

Retail price change is not a good explanatory variable of consumption change.
Consumption is very inelastic.
Other factors include: Errors in price discovery, Changes in consumer demand, Price level itself

Data source: Bureau of Labor Economics and USDA

New House Construction

Permitting

One year

(can take 3 months to 3 years)

Construction

5-6 months to construct building <u>after</u> contracts are issued

Cage-free takes longer since pullet houses are needed

Stocking

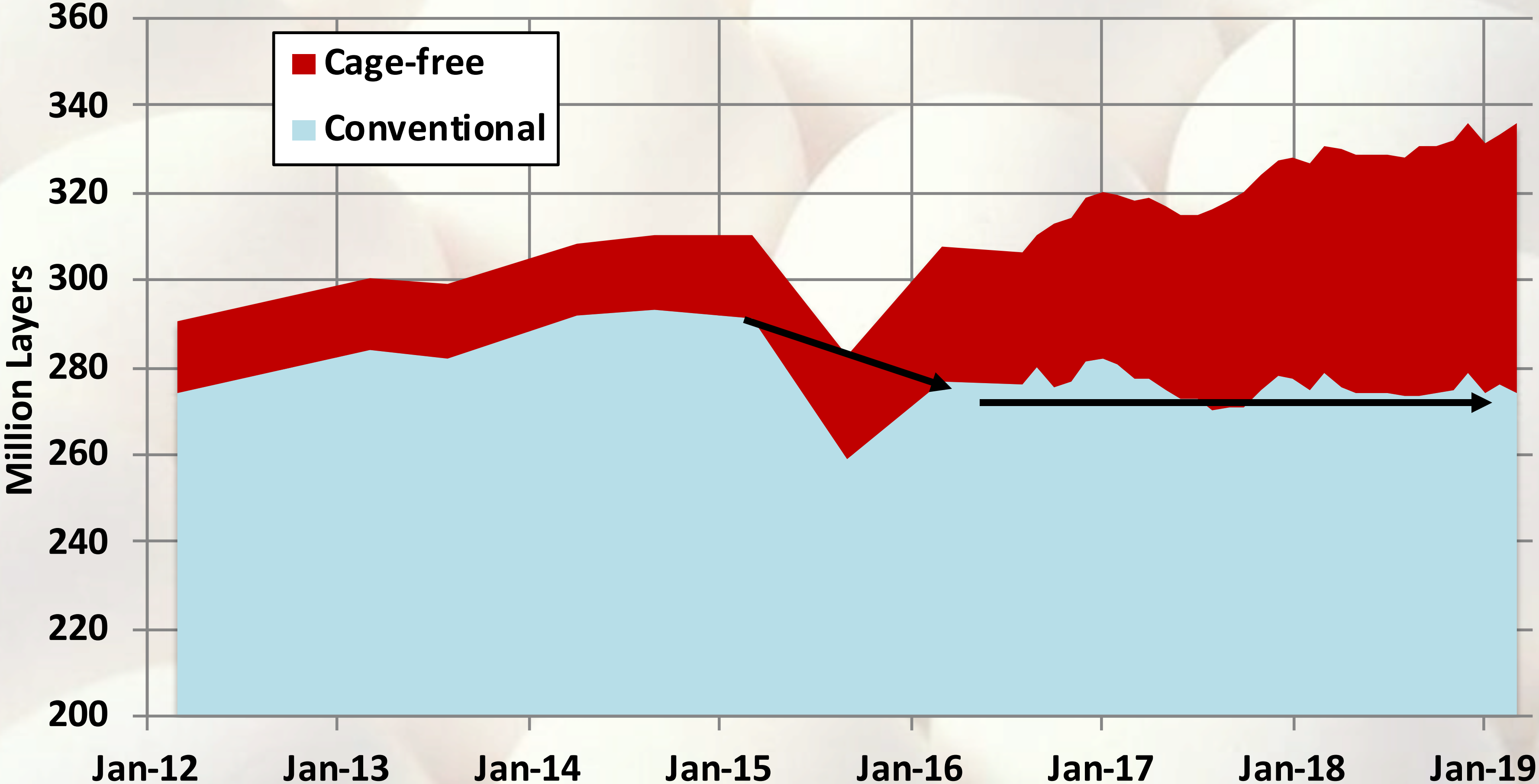
Need to order chicks 1 year in advance

Takes approximately 4 months to raise a pullet flock

Can take 2+ years before eggs can be produced!

Source: Kristin Tupa (Cargill) 2017

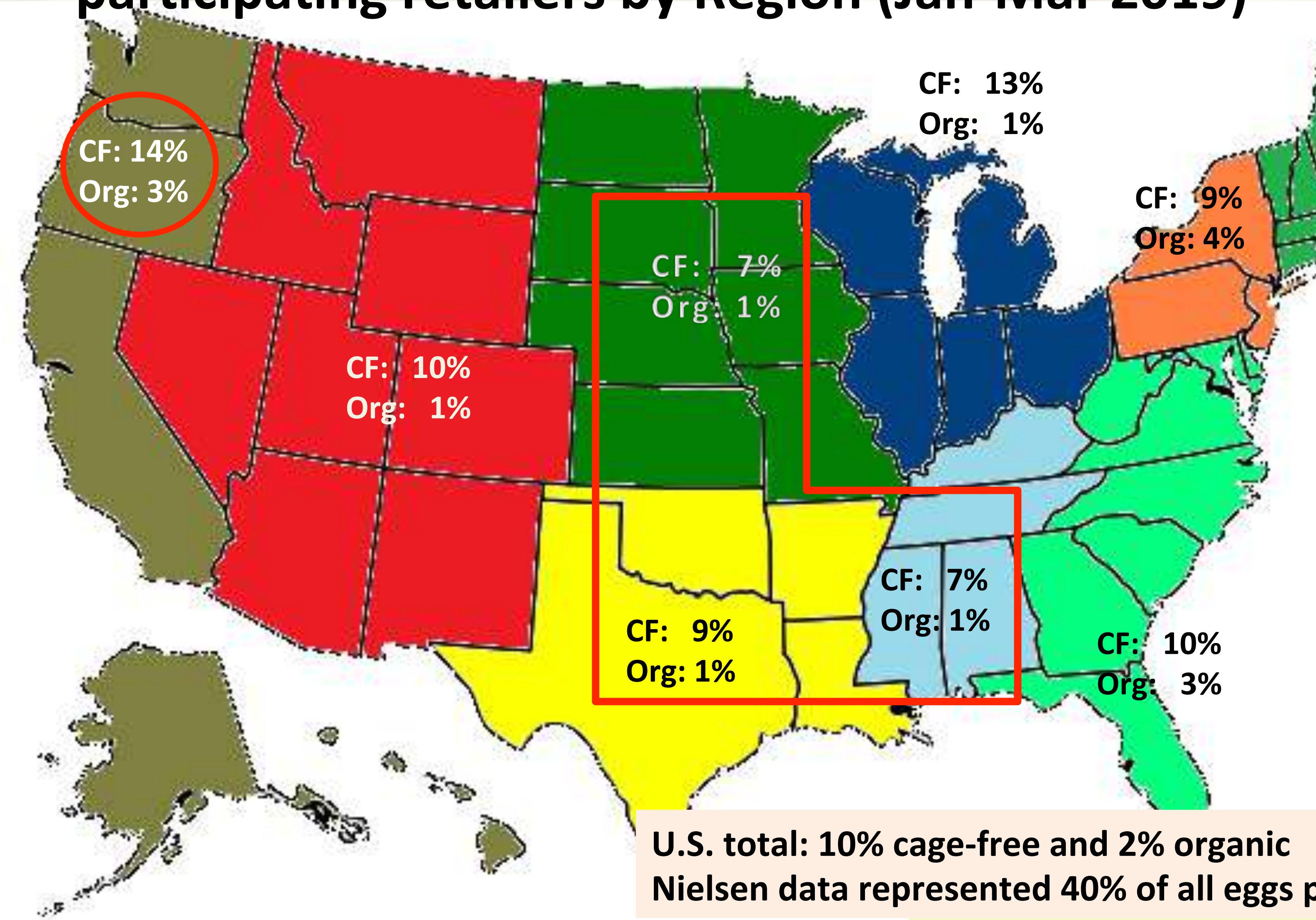
U.S. Conventional and Cage-Free Layers



Source: USDA AMS

Most of new construction is not replacing old conventional houses

Percent of cage-free and organic eggs sold in Nielsen participating retailers by Region (Jan-Mar 2019)

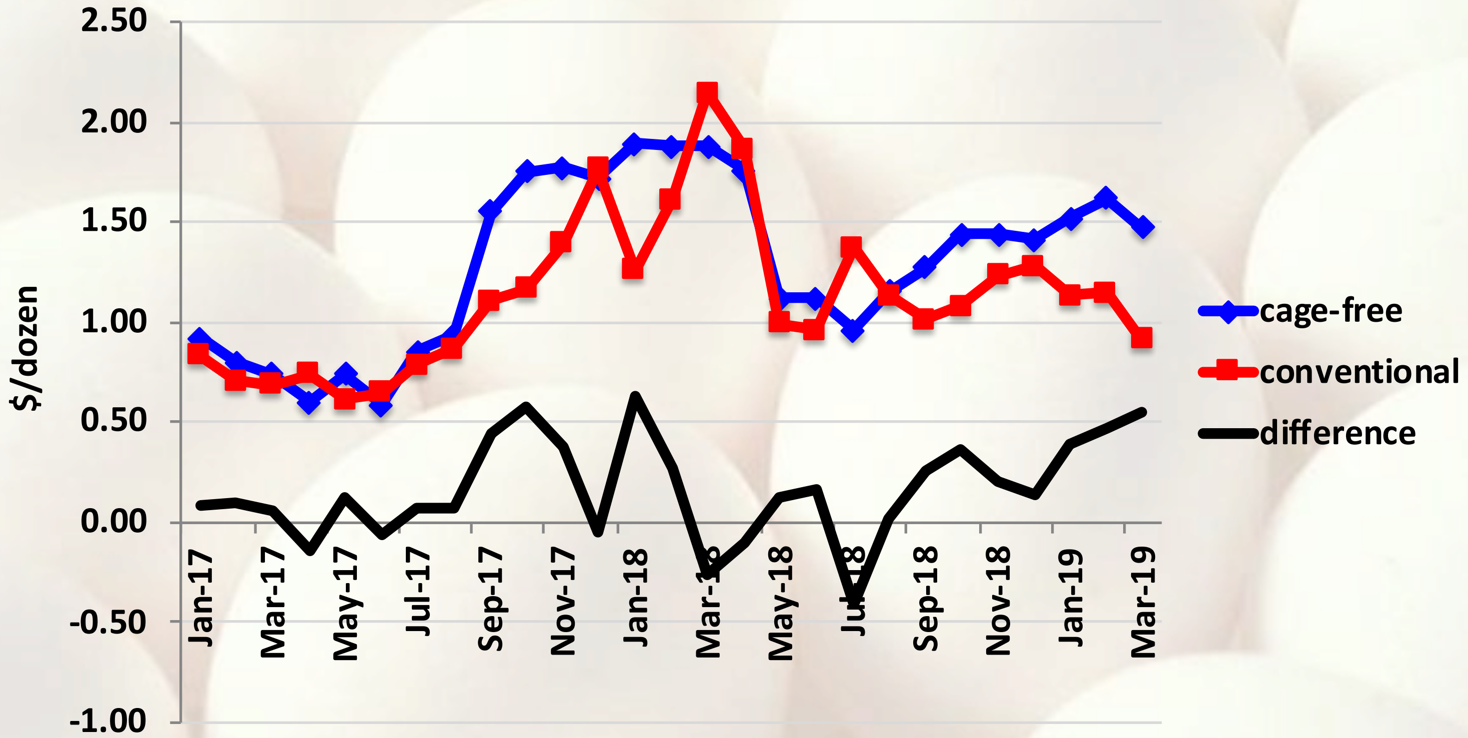


U.S. total: 10% cage-free and 2% organic
Nielsen data represented 40% of all eggs produced

Source: Nielsen Egg Trends 12 weeks ending Mar 23, 2019
from American Egg Board AEB Highlights [4/12/2019]

Only 79% of eggs are LG or larger
79% * 18% = 14%

Large Egg Prices



Notes:

the "Conventional" is the simple average of graded loose large white egg prices of 4-regions: MW, NE, SC and SE
the Cage-Free price includes pricing for both white and brown cage-free eggs

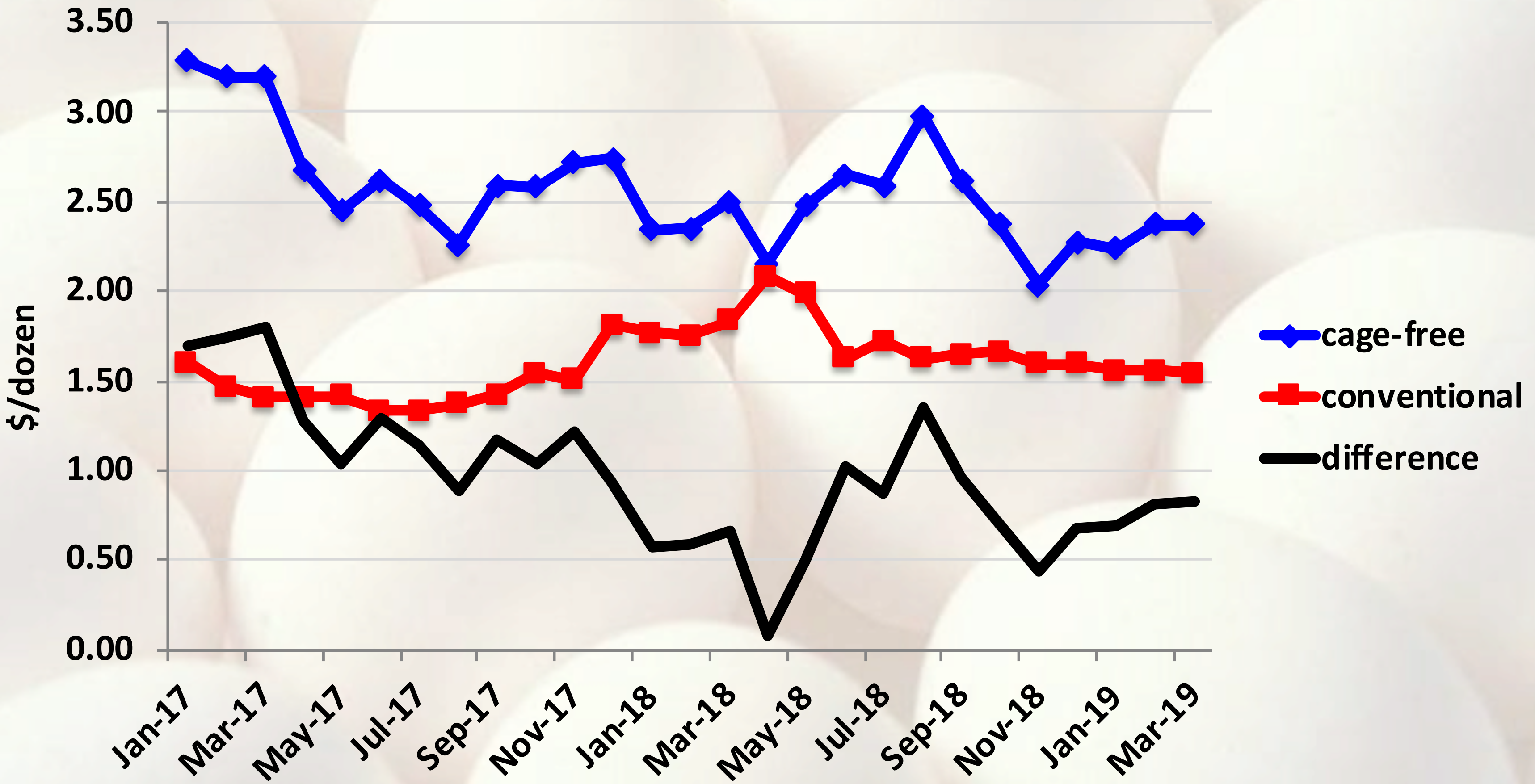
Last 2 years average: CC= 1.18 $/doz, CF= 1.35 $/doz, Diff.= 0.17 $/doz (15%)

The warehouse price difference didn't cover the cost difference

The conventional prices were good (trade war)

Some customers are not taking ALL the cage-free eggs.

Price of Cage-Free and Conventional Large White Eggs



Cage-Free Prices Source: USDA Monthly USDA Cage-Free Shell Egg Report

Conventional Prices Source: Bureau of Labor Statistics

Price difference last 2 years: 87 cents/dozen (54%) - (2.48 vs. 1.61)

CSES estimated cost difference: 24 cents/dozen (36%)

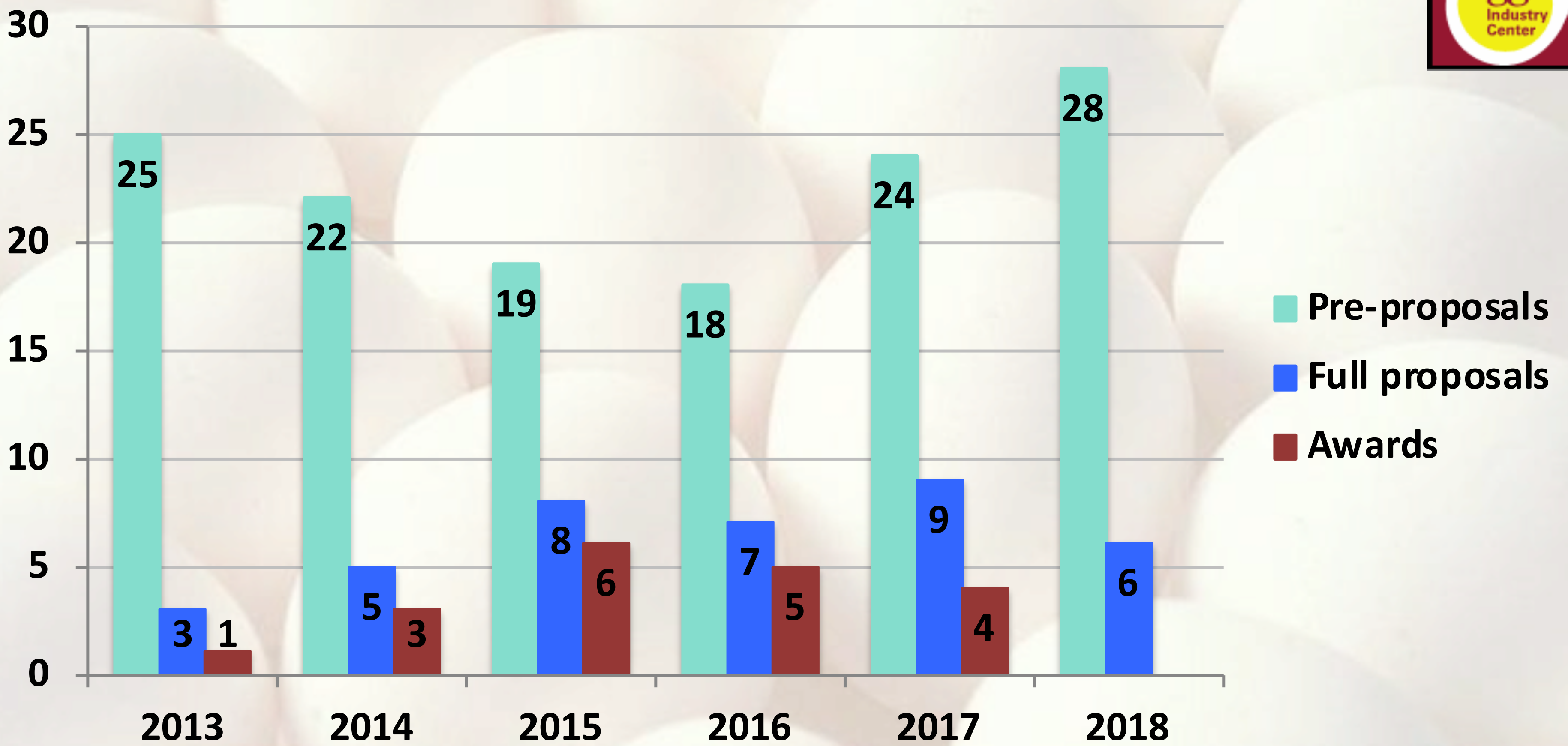
Economic concerns:

- Higher cost of production and higher prices for consumers
- Difficult to transfer the higher costs to the consumers during the transition (consumer preference)
- Uncertainty about future demand preferences (both ways)
- The ones that decide the direction of the industry are not the ones that bear the risks
- Credit access, 9.5 B dollars are needed to invest in the next 7 years
- Small producers will need to find new niche markets and convert to them as well
- Might affect the capacity of welfare programs such as WIC

Production and Health Concerns:

- Higher mortality is both: efficiency and animal welfare concern
- Poor feed conversion is both: efficiency and environmental footprint concern (GWP)
- Reappearance of diseases and parasites problems which were easier to control in cages (e.g. coccidiosis, roundworm, red mites)
- Floor eggs which result in food safety concerns
- Dust problems might affect bird health and worker health
- Need more <u>rural</u> labor and more skilled labor

Egg Industry Center: Grant proposals received and awarded



6 out of the 19 Grant awarded are for research related to housing systems (on top of Dr. Xin research)

Many good ideas havn't been awarded just because of the limited funds

EIC Funded Research Housing projects (6 out of 19 studies are related to housing)

1. Causes of Keel Bone abnormalities in Laying hens housed in Enriched Colony Systems (Dr. Makagon – UC Davis)
2. Improving the transition between rear and lay environments to improve welfare and productivity of aviary-housed laying hens (Dr. Siegford – MSU)
3. Cage-Free housing ventilation options to reduce disease spread, improve air quality, and enhance bird welfare (Dr. Fabian - PennState)

EIC Funded Research Housing projects (cont.) (6 out of 19 studies are related to housing)

4. Comparison of gut and lung microbiomes of hens raised in conventional and cage-free houses to determine disease susceptibility (Dr. Mellata – ISU)
5. Robotic Systems for Reducing and Collecting Floor Eggs in Cage-Free Hen Housing Systems (Dr. Zhao, Mississippi State University)
6. Characterizing intestinal health, bacterial communities, and their interaction between caged and cage-free housing in commercial layer (Dr. Koltes, ISU)

EIC Research Projects - Dr. Xin
(4 out of 9 studies are related to housing)

1. Quantifying individual hens feeding and nesting behaviors in group housing and the impact of resource allocation on these responses
2. Evaluating effects of LED vs. CFL lighting on behaviors and production performance of pullets and laying hens
3. Mitigation of ammonia and PM generation in litter-floored cage-free hen housing systems
4. Field Findings of Partial vs. Full Litter Access in Aviary Hen Housing

Proposition 12 introduction

- Starting on January 1st 2020: 144 ft^2/hen
- Starting on January 1st 2022: cage-free with 1.0-1.5 ft^2/hen (UEP guidelines)
- Shell eggs and egg products sold in California

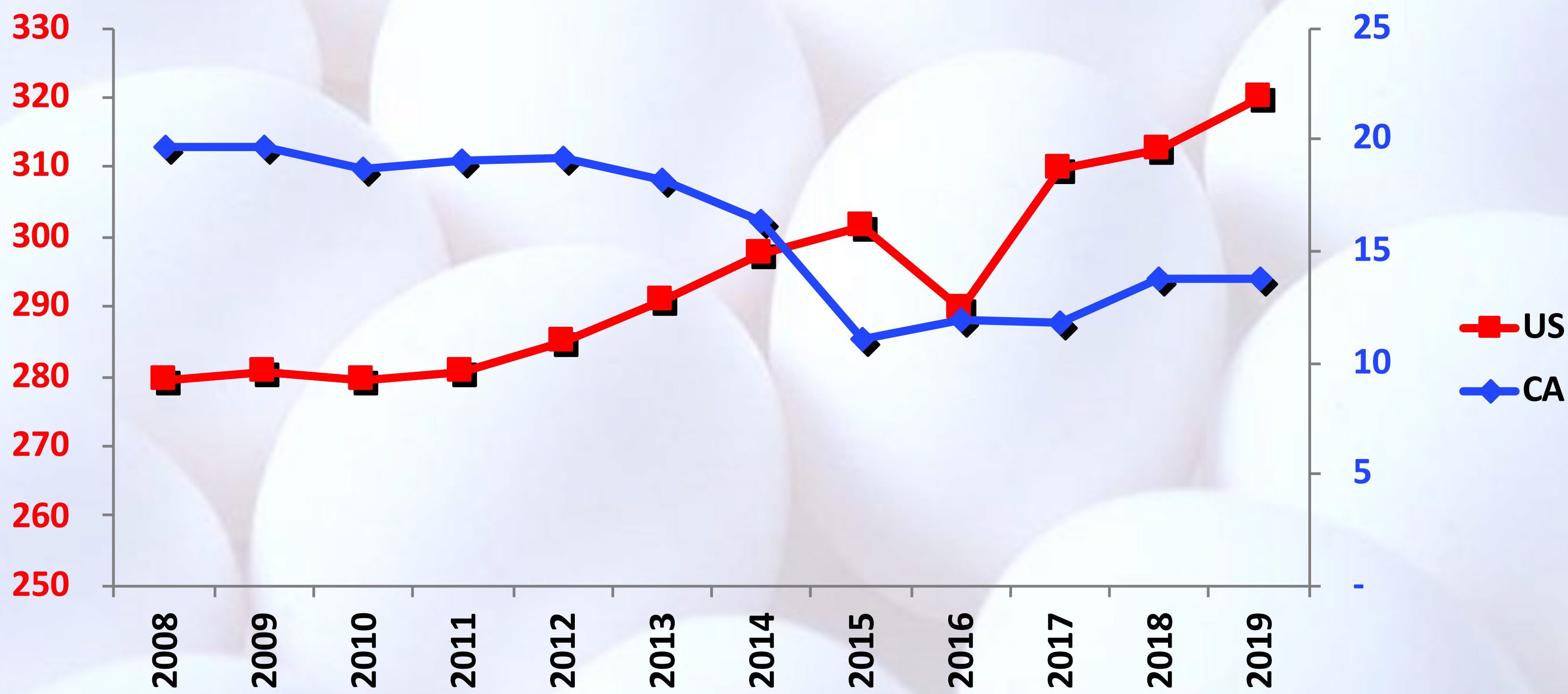
Proposition 12 vs. Proposition 2

- Prop 12 requires cage-free housing
- Egg products are included under Prop 12
- Prop 12 include clear definitions of the housing requirements
- Prop 12 is for all eggs sold in California even if they are produced elsewhere and pasteurized

California Egg Production and Consumption

- 40 M people consumed 11.4 B eggs in 2018 (equivalent of the production of 39 M layers)
- Shell eggs demanded 8 B (27 M layers)
- CA only has 14 million layers (needs to import at least 67% of what they consume)

Million table egg layers on 1st month of the year (in flocks ≥30,000 hens).



Source: USDA NASS

Between Jan 2012 and Jan 2015: CA flock was reduced by 8 million layers (42%), while US flock was increased by 17 million layers (6%).
Between Jan 2015 and Jan 2019: CA flock was increased by 3 million layers (24%)

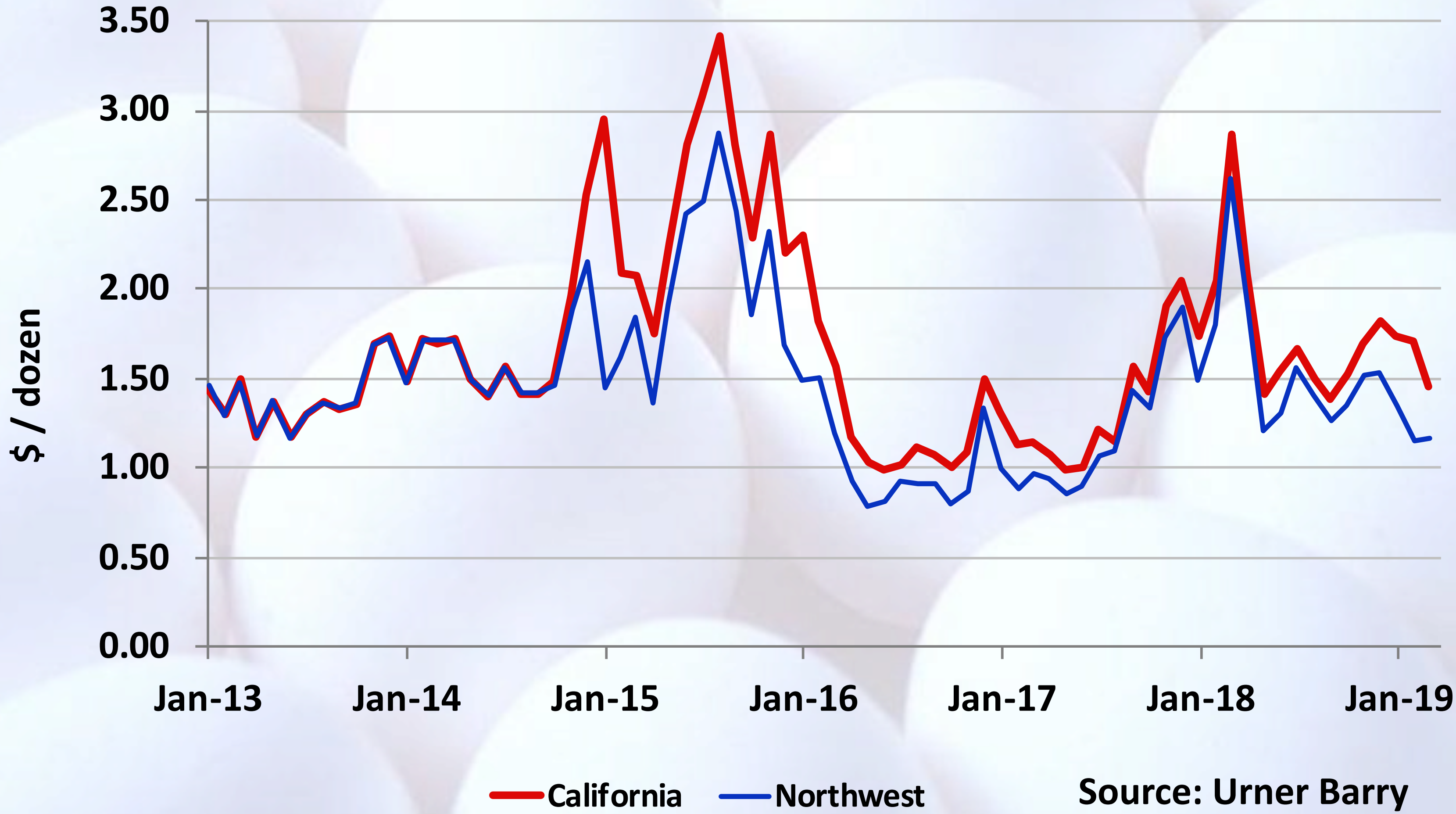
Investment needed and costs for CA supply

- Cage-free COP is 36% higher than conventional and 21% (CSES)
- Building CF to 39 M layers cost 2.3 B dollars
- Building CF to 27 M layers for shell egg demand only cost 1.6 B dollars
- Developing a new site adds more than 25% to the cost
- Some of it is already built but most still needs to be paid
- Production efficiency can be improved but it is hard to get around the higher upfront investment.

Upfront investment needed for CA supply

- Higher upfront investment creates a barrier to enter and to exit the market in the short run (makes it riskier than Prop 2)
- Higher prices needed to compensate for these higher costs (costs are higher than producers margins)
- In the long run: price differences should be close to COP differences (explain)

Price of Large White Eggs in California and Northwest Region



- Price difference last 2 years: 15%
- CSES cost difference: 13%

Prices and Costs

- A 36% increase w.r.t. last 10 year retail price represents 66 cents/dozen, but if they are already 24 cents/dozen higher after Prop 2, there are 42 cents/dozen more to go
- Demand for eggs is very inelastic -10%, but elasticity is higher for people with lower income

Costs Effects Without Including the Egg Products

A 36% increase in retail price represent:

- $27/year for a family of four (on top of the extra $15/year they are already paying)
- 275 million dollars/year for CA consumers (on top of the extra 155 million dollars/year)
- 4.2 million dollars/year for the WIC program: (on top of the extra 2.4 million dollars/year)

WIC program needs to get additional funding or they would be able to cover less people

Implications of egg products being included

- An increase in cost for food companies that use liquid or dried eggs as their main ingredients is expected:
  - hard to quantify effect on CA consumers because companies that make pasta, ice-cream, chocolate, etc might be located outside California shipping only the final product into the State.
- Food service and food manufacturing inside CA would experience a 36% increase in cost of eggs (transfer to the consumers)
- Competitive disadvantage to food manufacturers in CA
- Some might decide to move part of their operations outside the State (depending on costs and skilled labor availability)

Possible market implications inside CA

- Possible shortage of eggs in CA, but:
  - The U.S. cage-free capacity grew by 31 million layers in the last 3 years, so it is very likely that it will grow that much in the next 3 years if financing is available and the right market incentives are put in place.
  - There are already 62 million cage-free layers in the U.S. (including organic), but many of them are supplying markets other than California.
- Need more control at production and at the border (12 K dollars value difference for a truckload of cage-free eggs vs. conventional eggs)

Possible market implications outside CA

- Possible oversupply of conventional eggs outside CA:
  - if producers supplying CA with 116 in^2/hen decide to leave
  - if not enough conversion
- On the other hand, some will convert conventional into cage-free to supply CA
- It is unknown which of the 2 forces is going to be stronger.

Concluding remarks

- Cage-free trend needs a larger upfront investment and more time to build capacity than CA Proposition 2
- Retailers need to find ways of selling cage-free eggs at the necessary premium during the transition
- Outside CA: possible supply of conventional and CF eggs within each region
- Proposition 12 will result in higher costs for customers and competitive disadvantage to food manufacturers in CA
- Proposition 12 is going to help with customers pledges to transition to cage-free by creating an intermediate market.

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