

A Tale of Two States: Decomposing Production Trends in the US Dairy Sector

Jared Hutchin, Ph.D.

Assistant Professor

Agricultural and Consumer Economics

National Workshop for Dairy Economists and Policy Analysts



UNIVERSITY OF
ILLINOIS
URBANA - CHAMPAIGN

Growth potential in the US dairy sector

Pro-growth factors:

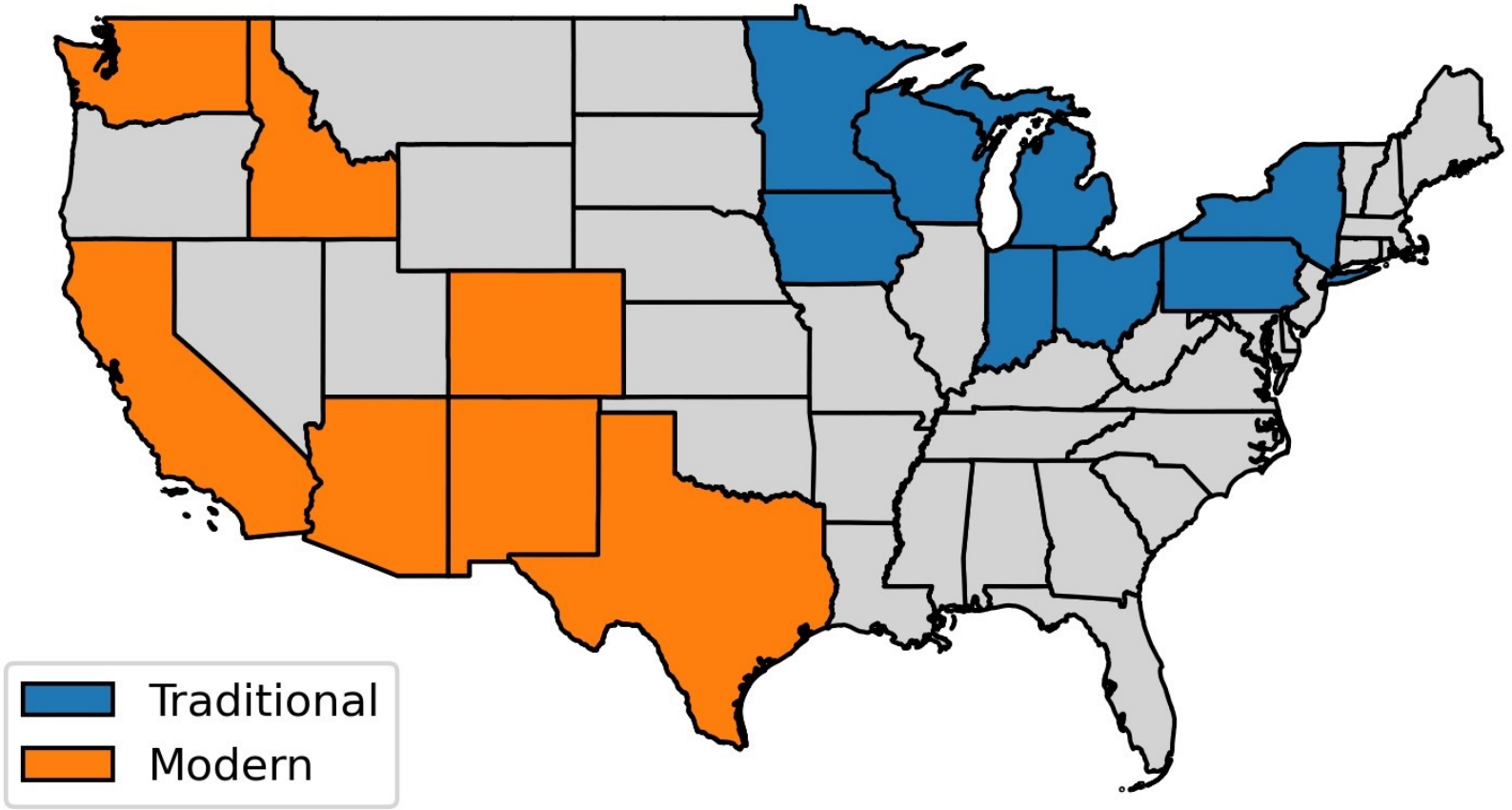
- Demand for dairy products (especially processed) is still strong.
- Genetic improvement is growing stronger than ever.

Barriers to growth:

- Regulations on CAFOs, zoning concerns.
- Supply management and supply chain disruption.
- Climate (especially heat waves and drought).



Two different kinds of dairy sectors



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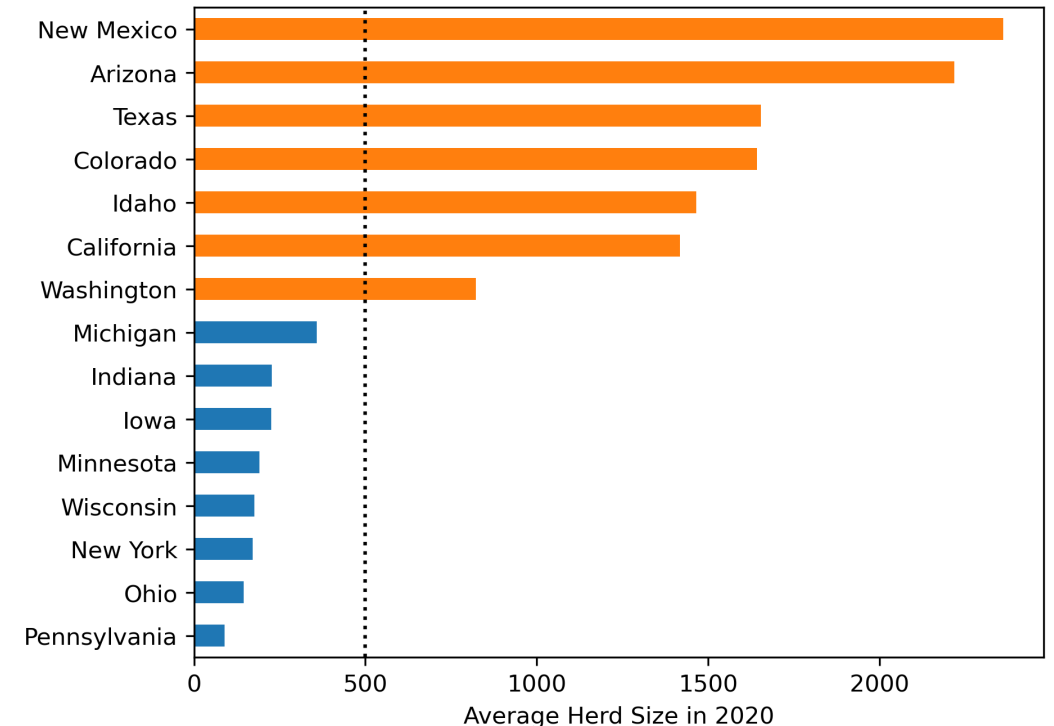
The dairy sector can be thought of as made up of two different kinds of states: **traditional and modern.**

Traditional:

- Longer history
- Smaller herd sizes (<500 head)
- Midwest and Northeast

Modern:

- More recent
- Larger herd sizes (>500 head)
- Mostly the West

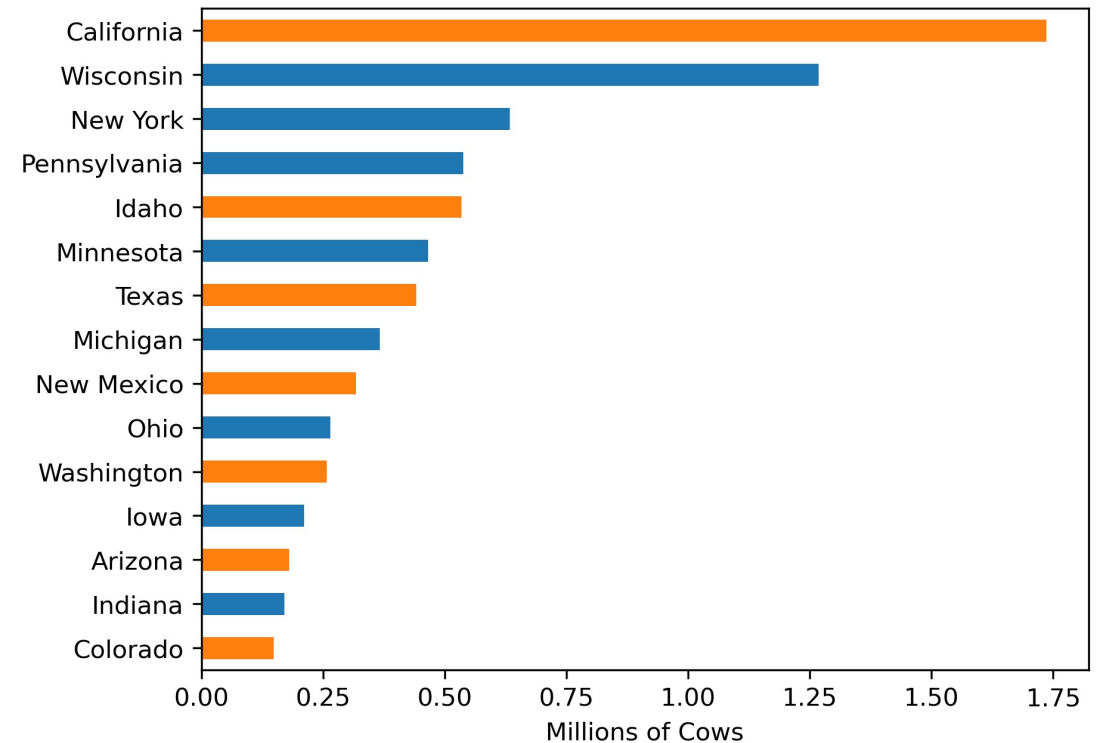


In this presentation:

I'll examine the production trends across the 15 biggest dairy states, specifically looking at:

- Total production
 - Milk yield
 - Number of cows
- Average herd size
 - Number of farms
 - Number of cows

Where are each of these states getting their gains from?

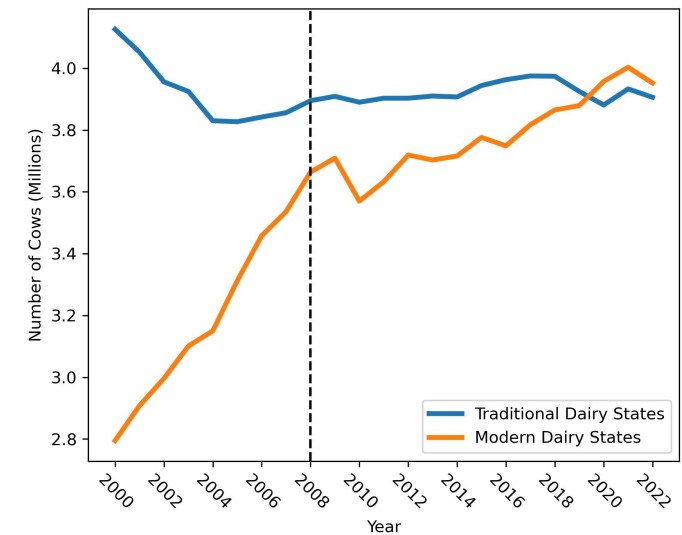
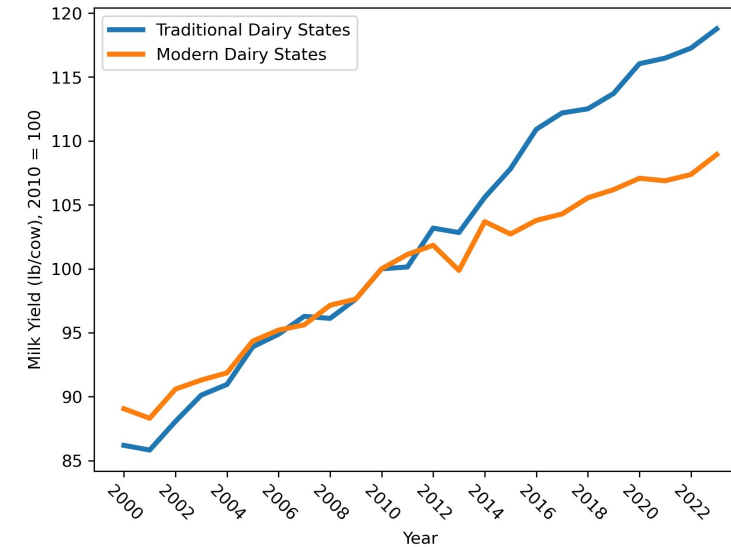


Key takeaways

The two types of states together contribute about the same amount of production, but in **very different ways**.

1. The “Traditional” dairy states **are growing in yield** but not in number of cows.
 - a. Also a stronger decline in farm numbers.
2. The “Modern” dairy states are adding cows but have **slower yield growth**.

Discussion: **what is causing this divergence?**



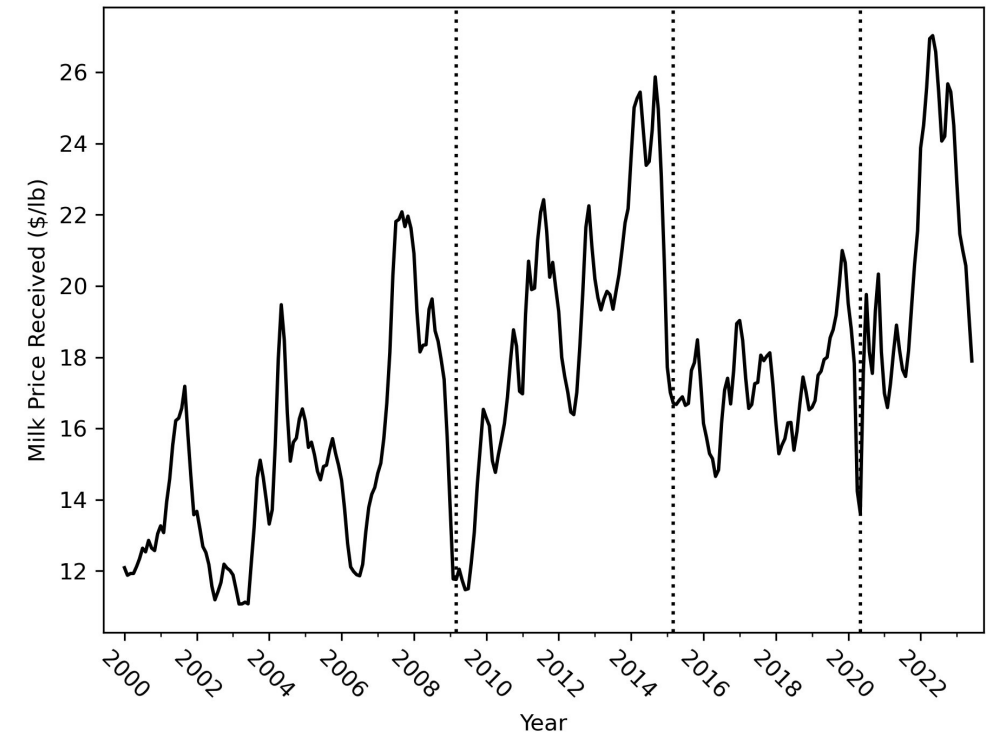
Data

NASS milk supply surveys at the state level

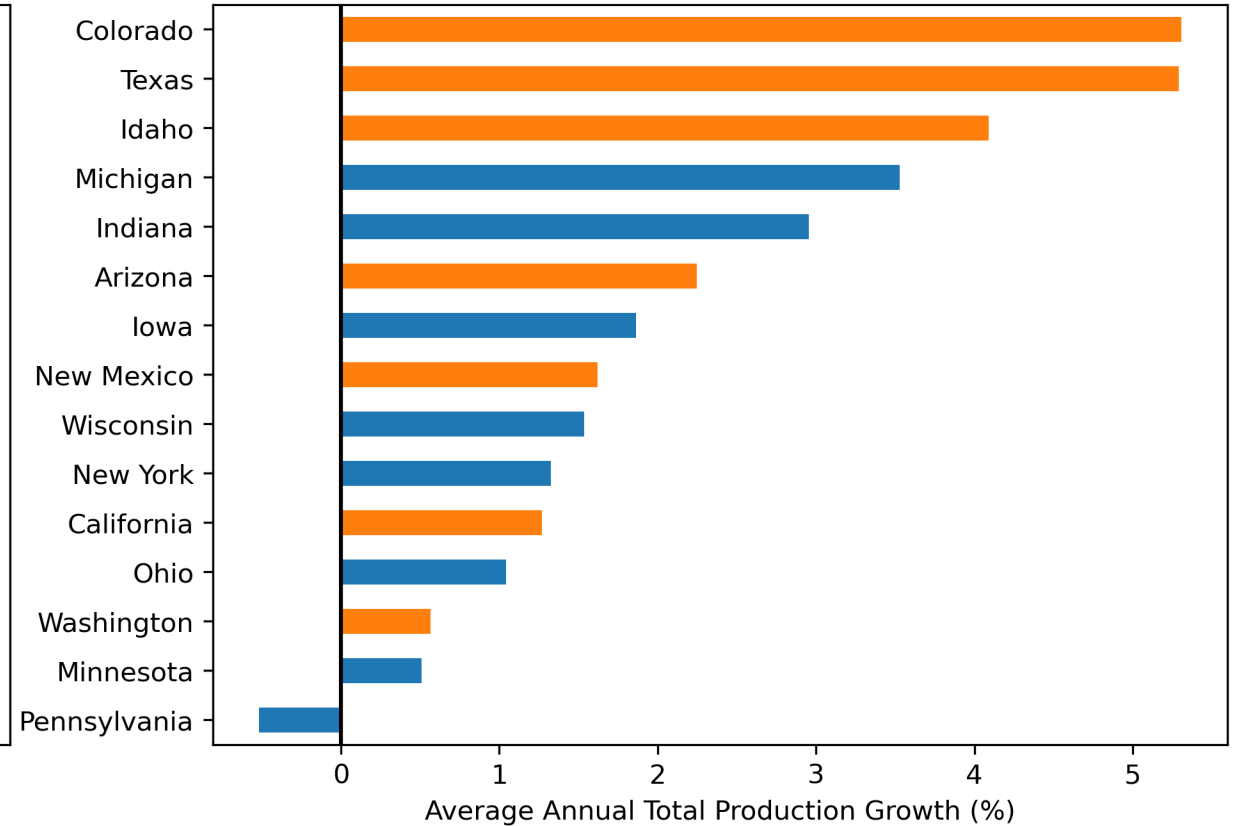
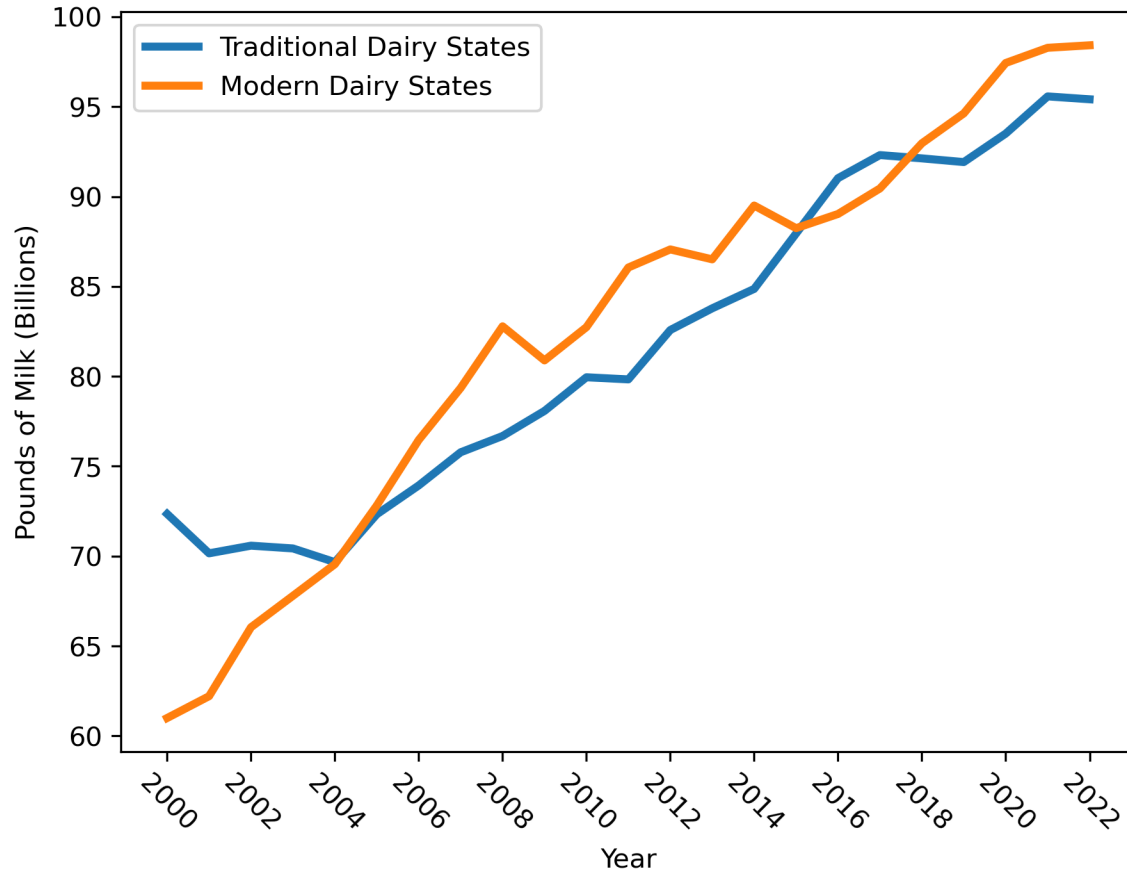
- Published every month.
- I'm using data aggregated to the annual level.
- I'll be looking at the past 22 years (2000-2022).

Some important things that happened:

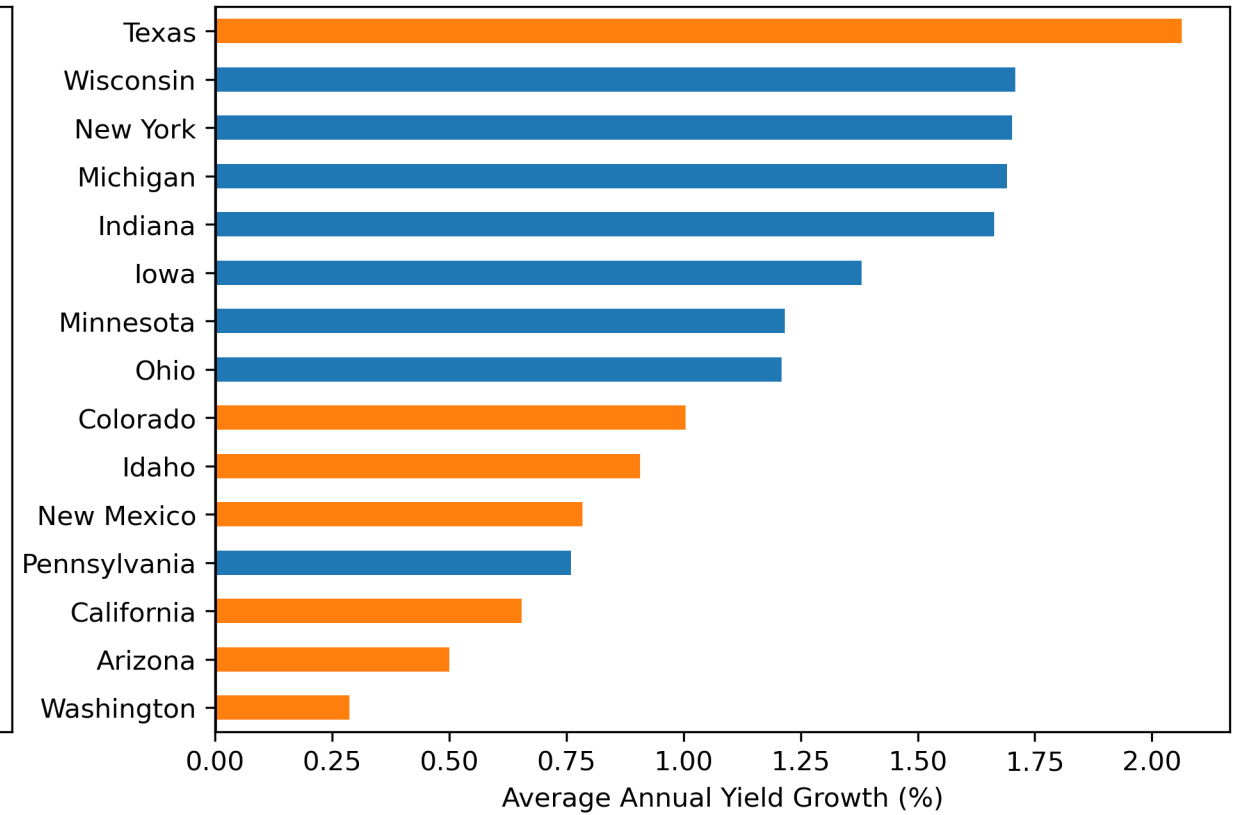
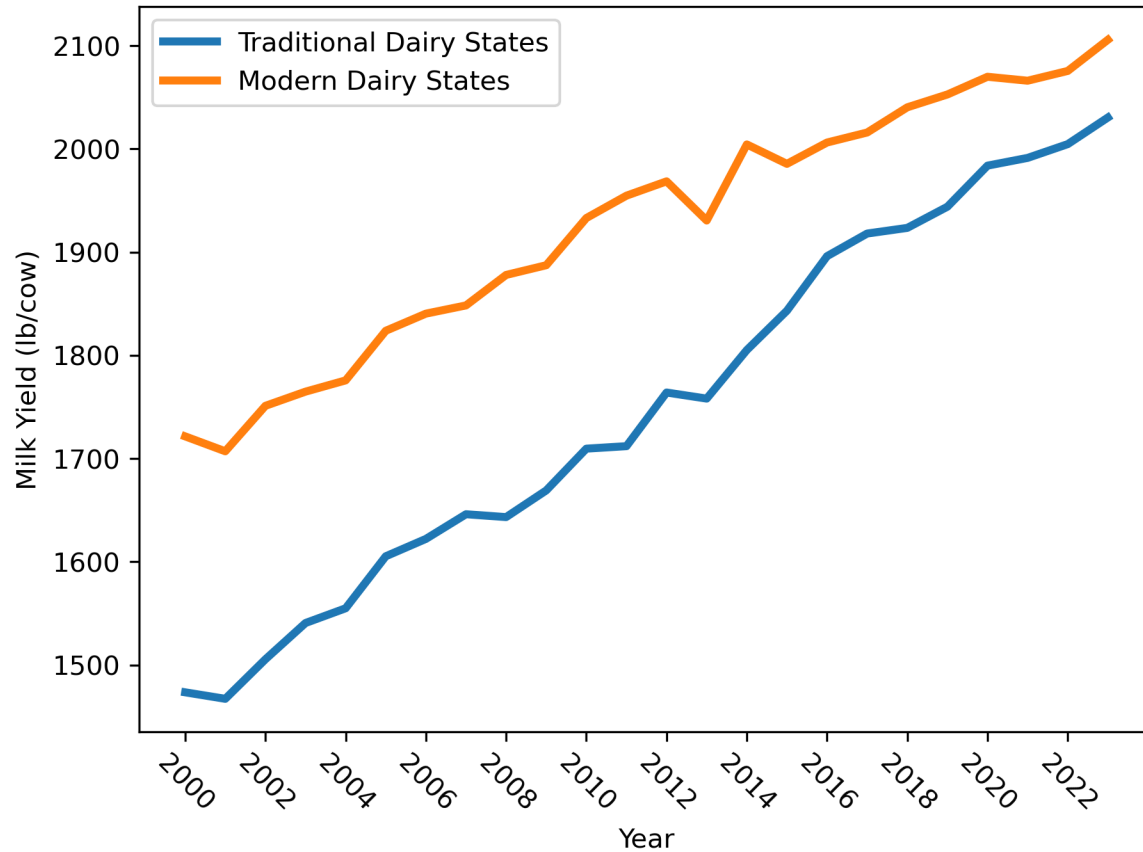
- **2008-2009: price peak and crash**
- **2014-2015: price peak and crash**
- **2020: pandemic, supply chain worries.**



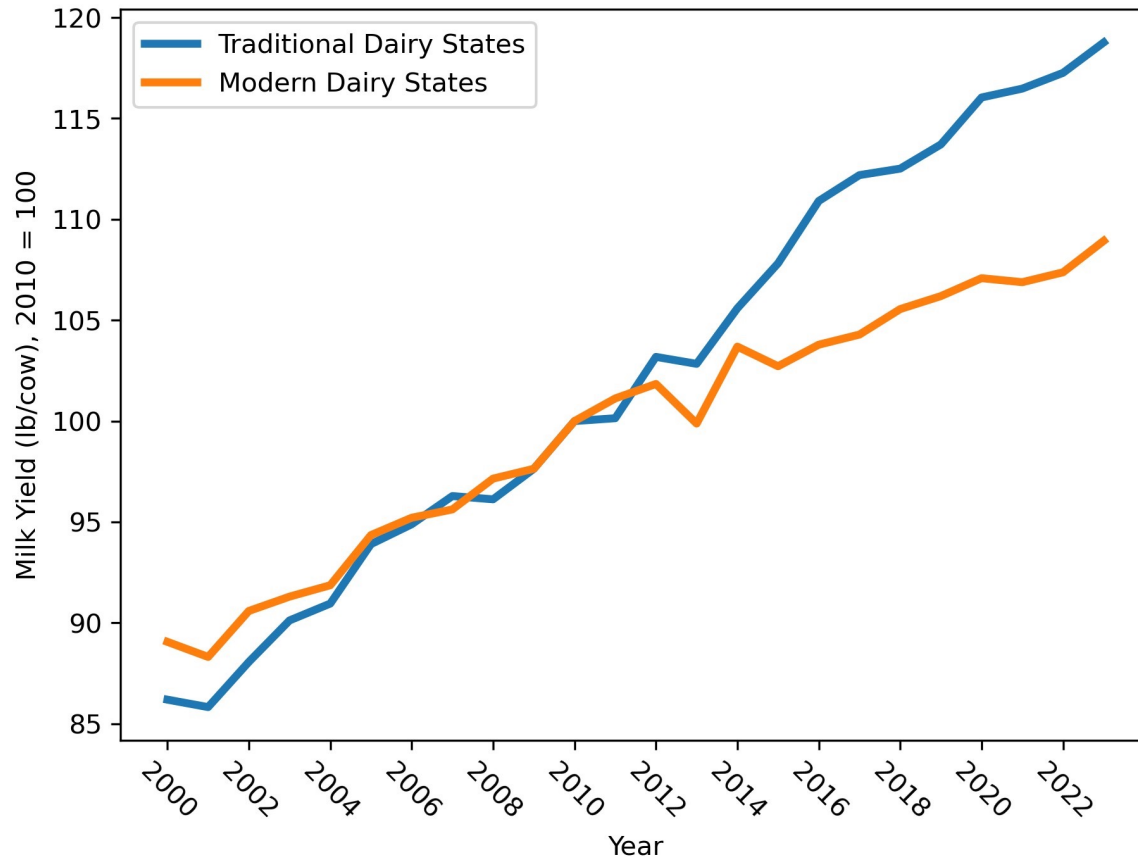
Total Milk Production = Milk yield x Number of Cows



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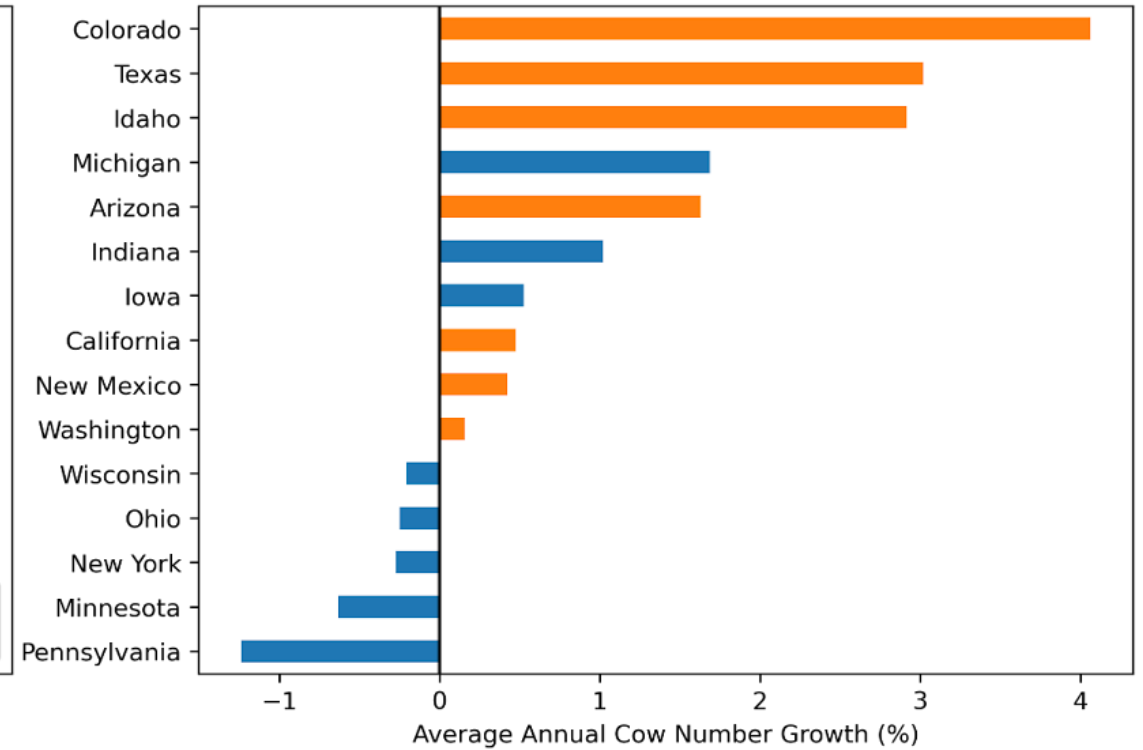
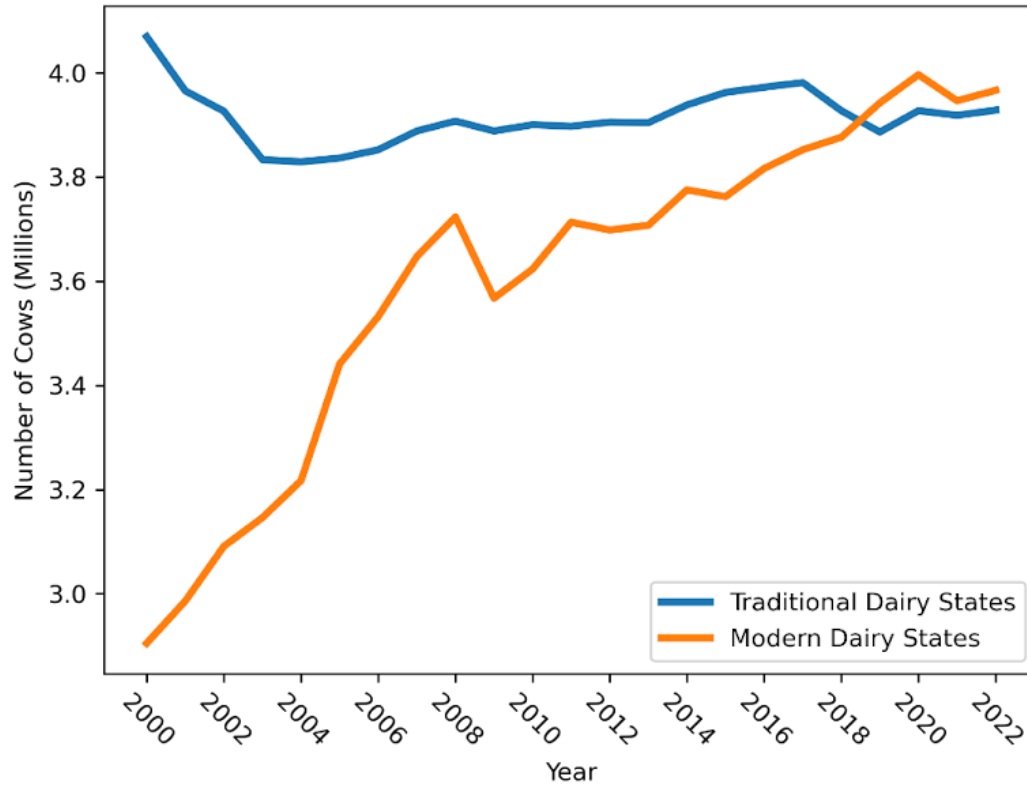
Traditional states are expanding milk yield **faster** than modern states.

Trends between states really start to diverge starting in 2012.

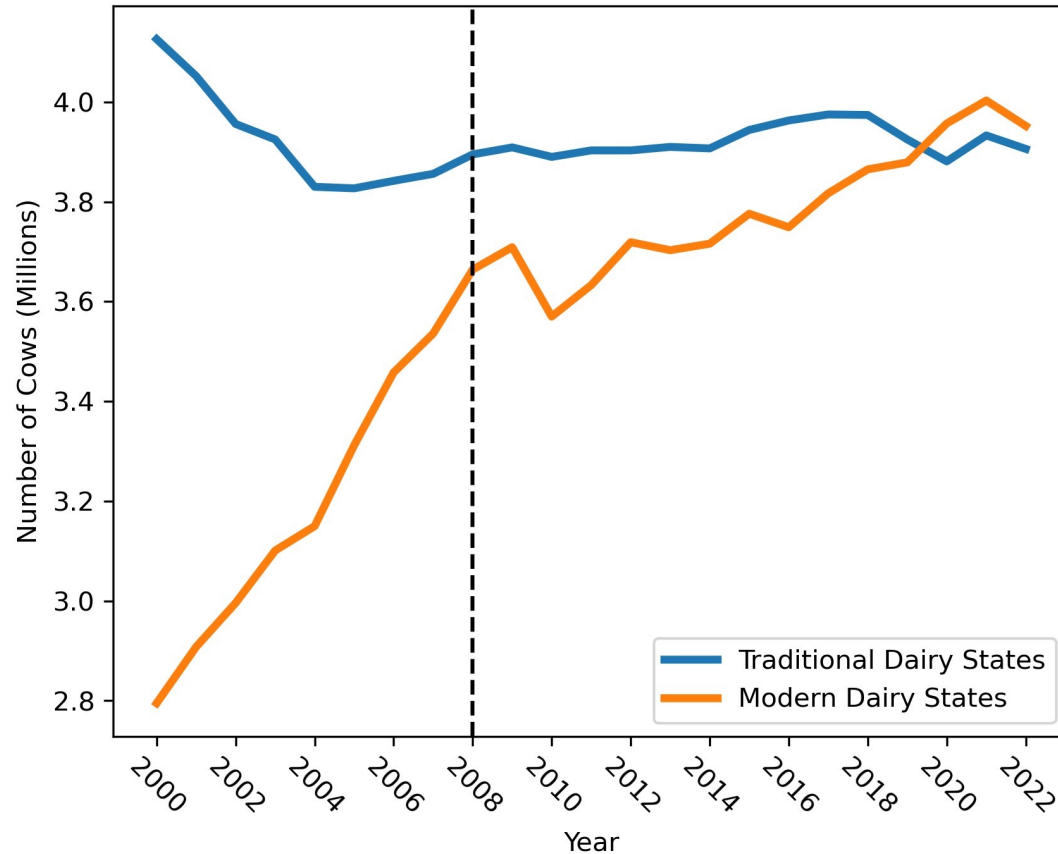
This follows the increase in genetic improvement in yield because of genomic testing coming to market in **2010**.



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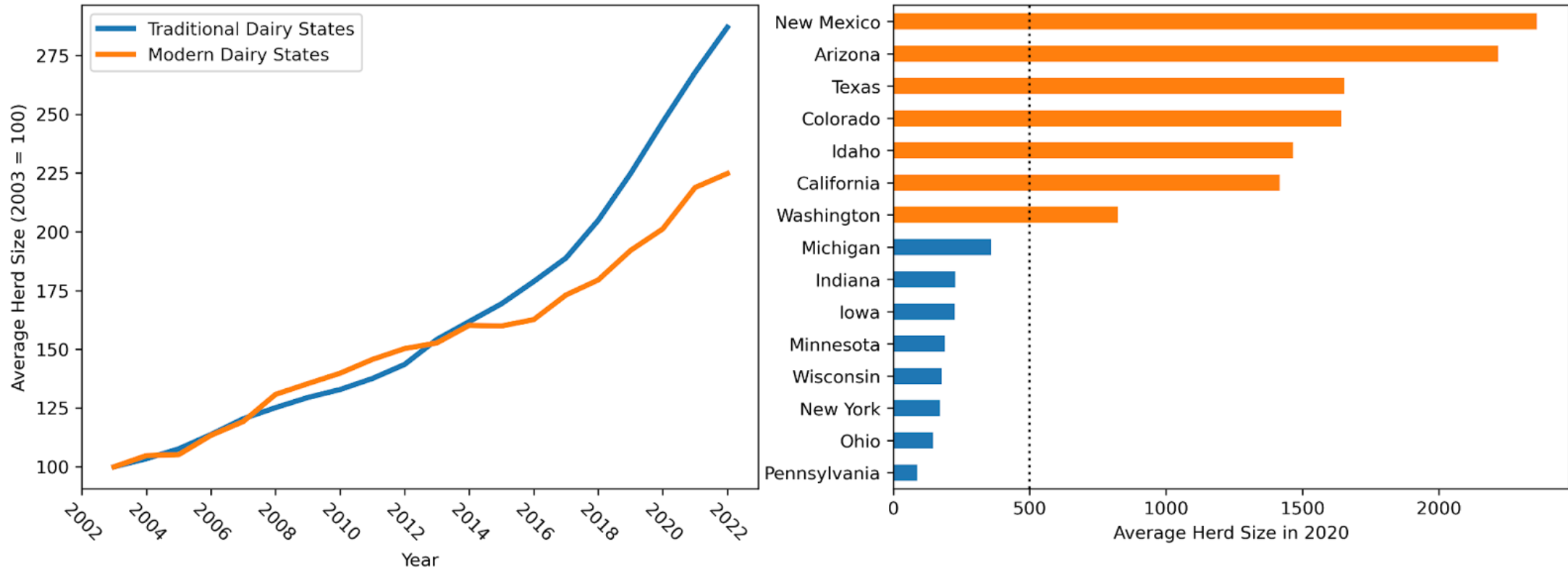


After 2008, modern dairy states slowed their cow number increase.

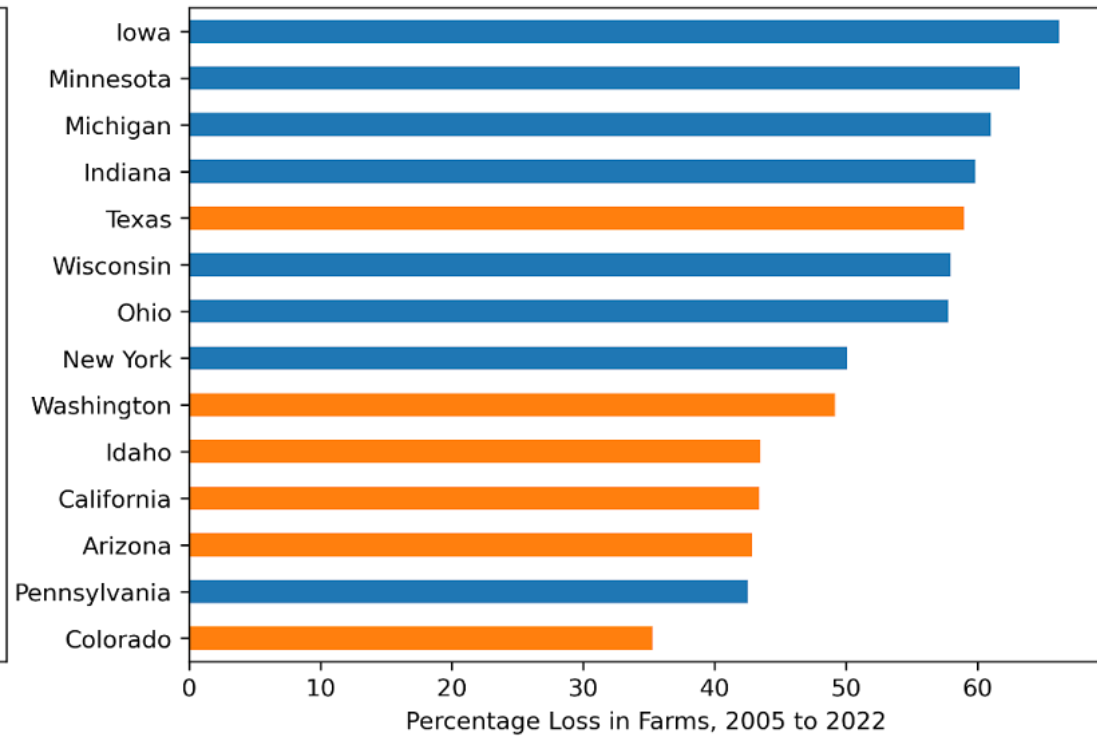
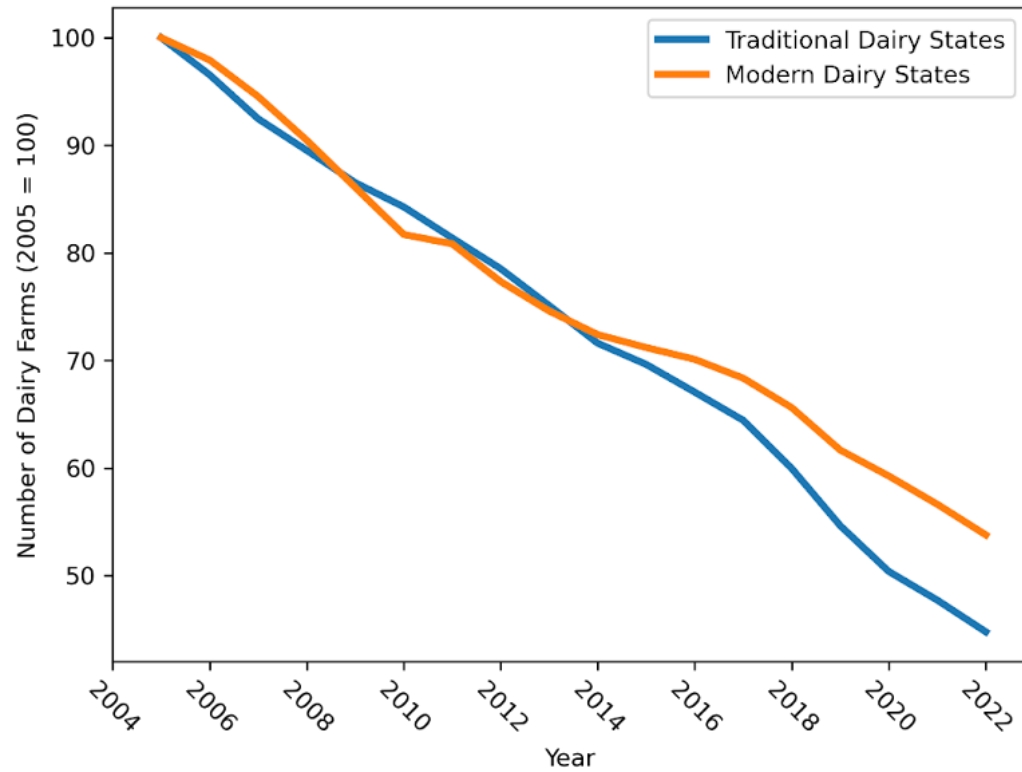
For most of this period, traditional dairy states have held constant.



Average Herd Size = Total Cows / Number of Farms



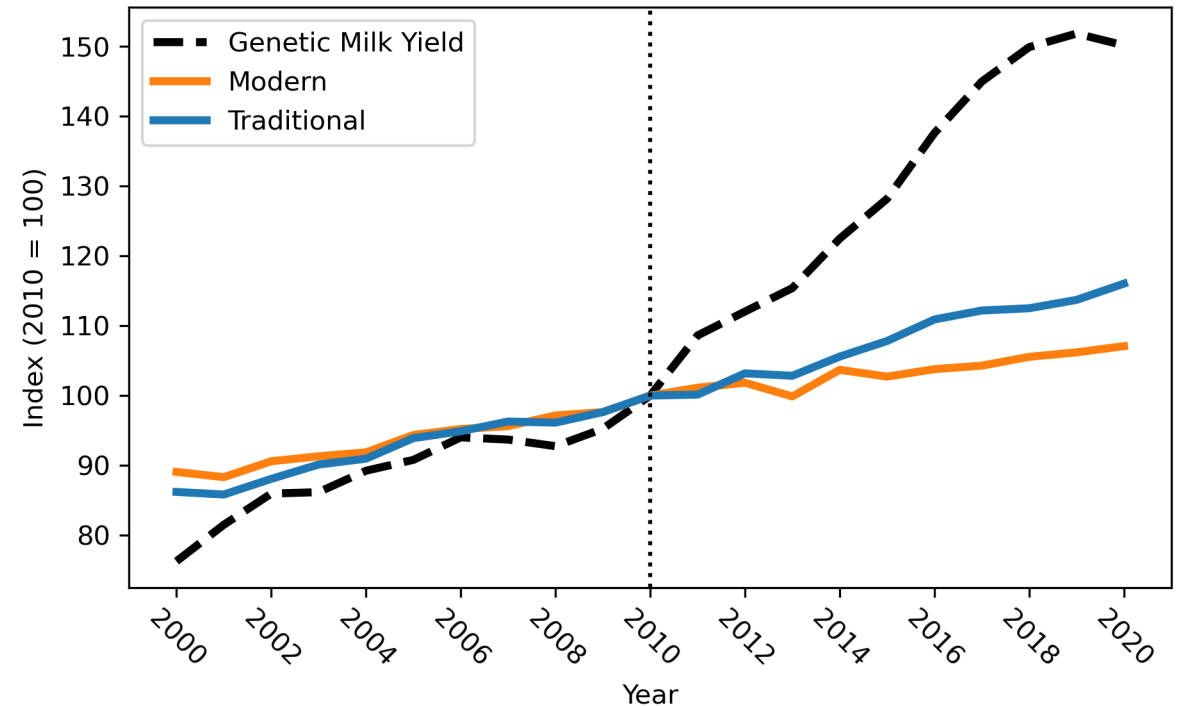
Average Herd Size = Total Cows / *Number of Farms*



Other observations

2010-2012:

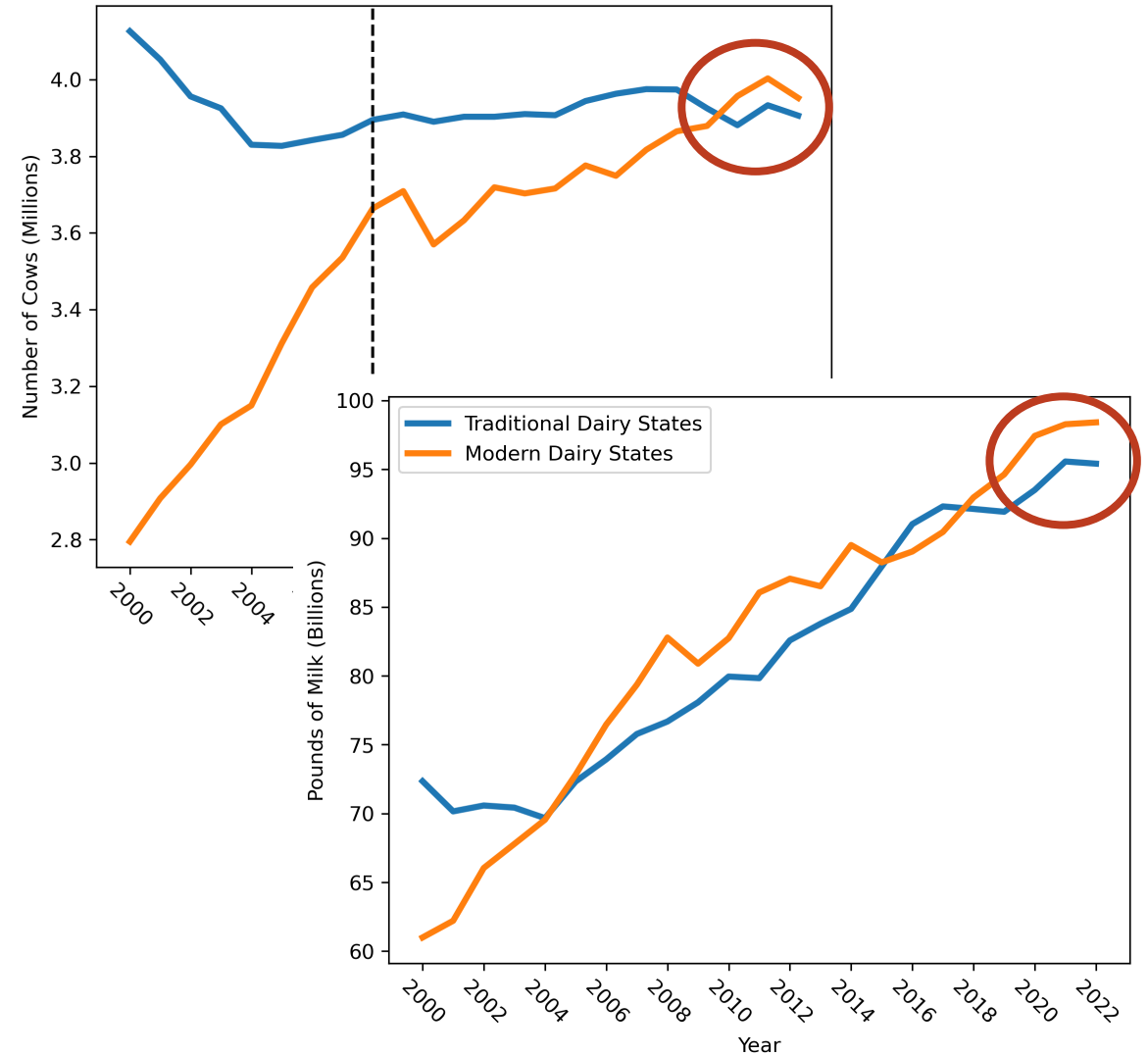
- After the invention of genomics, the milk yield trend for traditional states begins to break off from modern states.
 - *Hypothesis:* traditional dairy states are investing more in genetics than modern dairy states.



Other observations

2020:

- After interruptions to supply chain, cow numbers leveled off.
 - *Hypothesis:* supply chain issues/supply management may be making farms in these states skittish about expanding.



Points of discussion

- **Are we approaching a steady state in dairy cow numbers?**
 - The Solow growth model in action: after investments into capital are exhausted, all that is left is **productivity investment**.
 - Traditional dairy states may already be making these investments.
- **What should the role of supply management be in the future?**
 - More worries about the resiliency of the supply chain than before.
 - Is the 2020 dip in production **transitory**?



Thank you!



For comments and questions, please reach out to me:

Jared Hutchins, Ph.D.
jhtchns2@illinois.edu
www.jaredphutchins.com

