Dairy's Future Looks Bright: Opportunities for the Next Decade

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Director, World Dairy Expo, 2020 to present
President, Holstein Association USA, 2019 to 2022
Director, Council on Dairy Cattle Breeding, 2019 to 2022
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CoBANK
COOPERATIVE. CONNECTED. COMMITTED.

Dairy Innovation Summit — Northeast Dairy Business Innovation Center
Marriott Hotel, Albany, New York, April 3, 2024

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Dairy is an economic driver across the U.S.

California: $63 billion in economic activity

California: 443,000 jobs

Wisconsin: $45.6 billion in economic activity

Wisconsin: Each cow is a $36,000 economic engine

New York: $42 billion in economic activity

Texas: $40 billion in economic activity

Iowa: Each cow is a $25,000 economic engine

Source: USDA. Presentation by Corey Geiger, CoBank.

Milk matters more than cows when measuring growth

Dairy's growth in 25 years measured by cows:

- 1998 — 9.2 million dairy cows
- 2023 — 9.4 million dairy cows
- 2.6% growth rate for cows

Dairy's growth in 25 years by measuring milk:

- 1998 — 157.4 billion pounds
- 2023 — 226.6 billion pounds
- 44.0% growth rate for milk

Source: USDA. Presentation by Corey Geiger, CoBank.

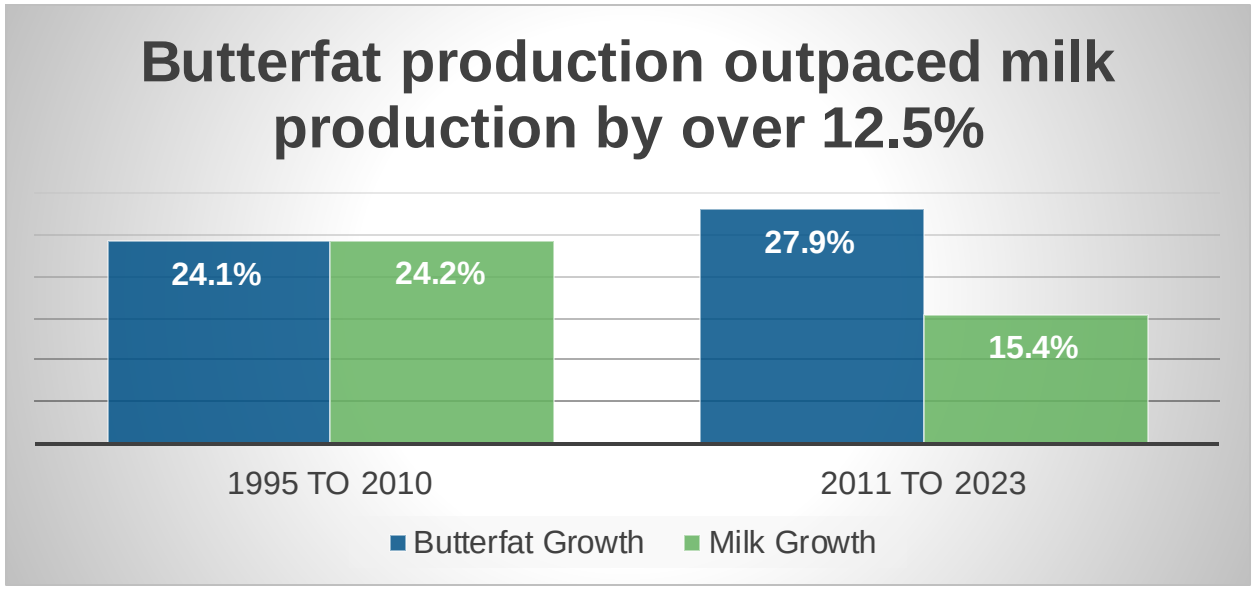
Track milk or component production?

Total U.S. milk output climbed from 196 to 226.6 billion pounds

- 15.4% growth 2011 to 2023

Total U.S. butterfat climbed from 7.3 to 9.3 billion pounds

- 27.9% growth 2011 to 2023

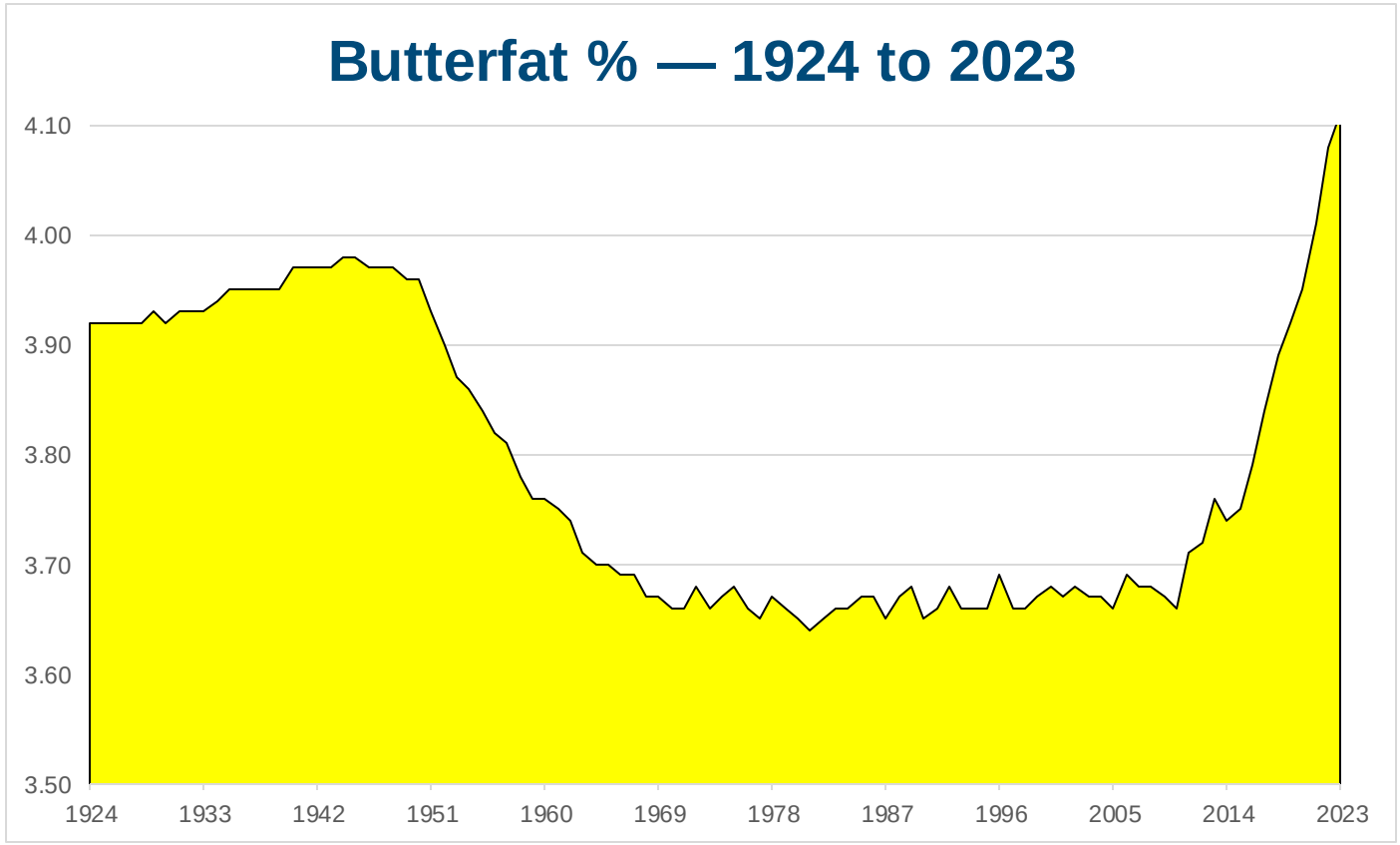


Source: USDA. Presentation by Corey Geiger, CoBank.

Milk is a dynamic, nutritionally improving food

- Composition evolving to meet market demand
- **Not** number 2 yellow dent corn
- Butterfat topped previous 1945 record of 3.98%
- Butterfat, protein levels will continue to grow
  - Nutrient-dense components bring value to consumers, farmers, processers

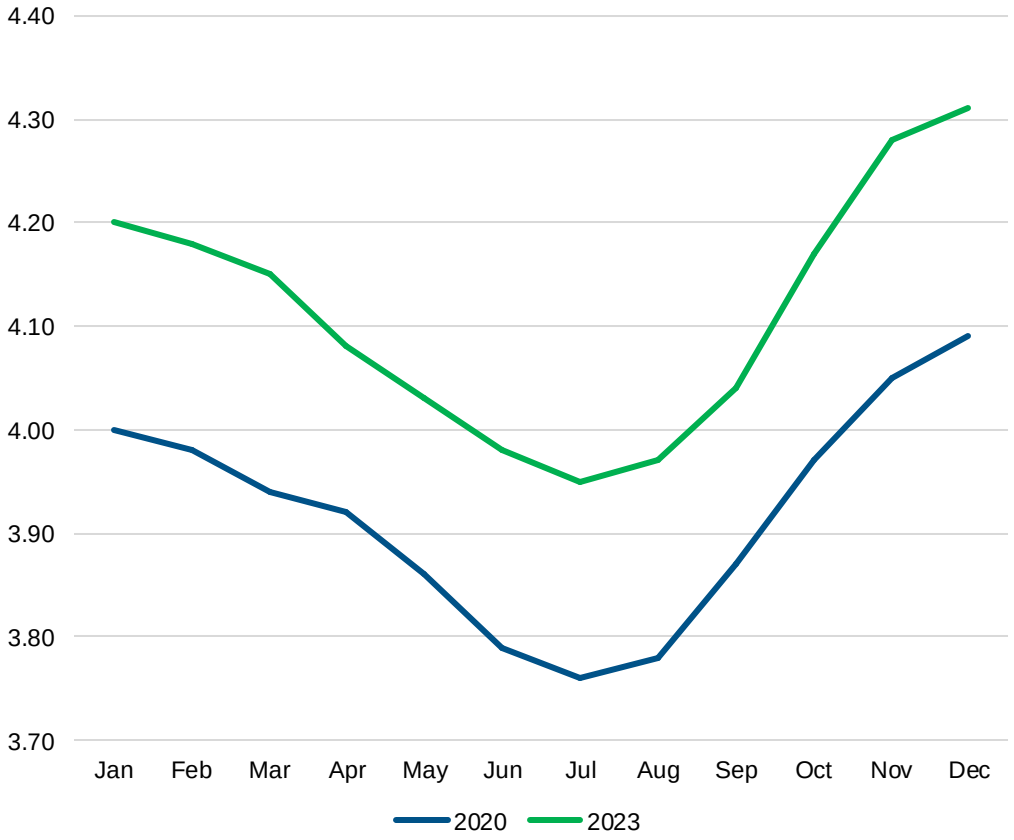
Butterfat has climbed to a record 4.11%



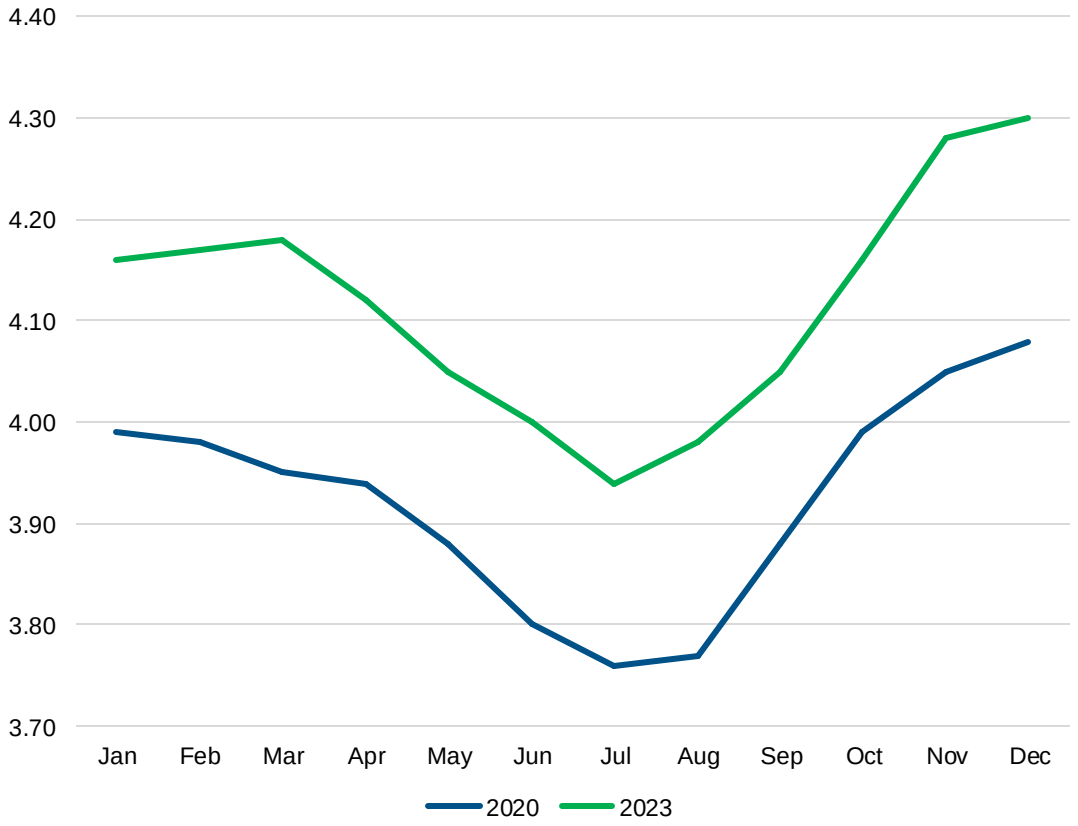
Source: USDA and U.S. Dairy Export Council. Presentation by Corey Geiger, CoBank.

The big shift in butterfat levels over the past four years

FMMO butterfat levels from 2020 to 2023



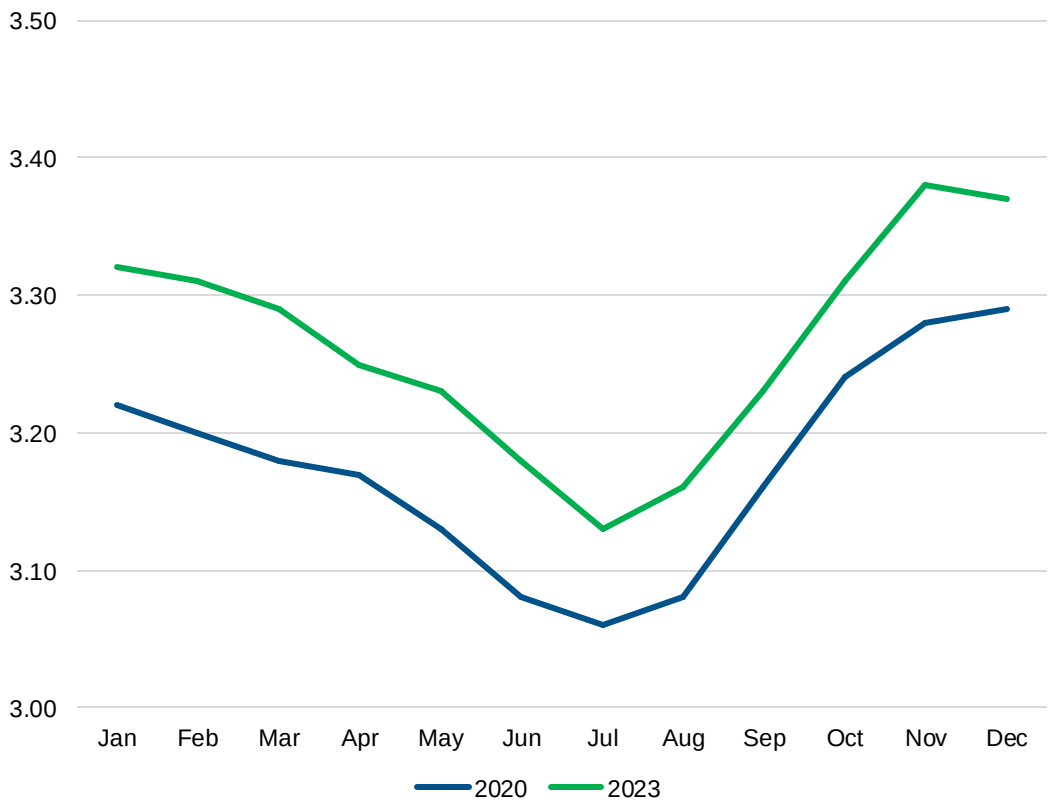
Northeast butterfat levels from 2020 to 2023



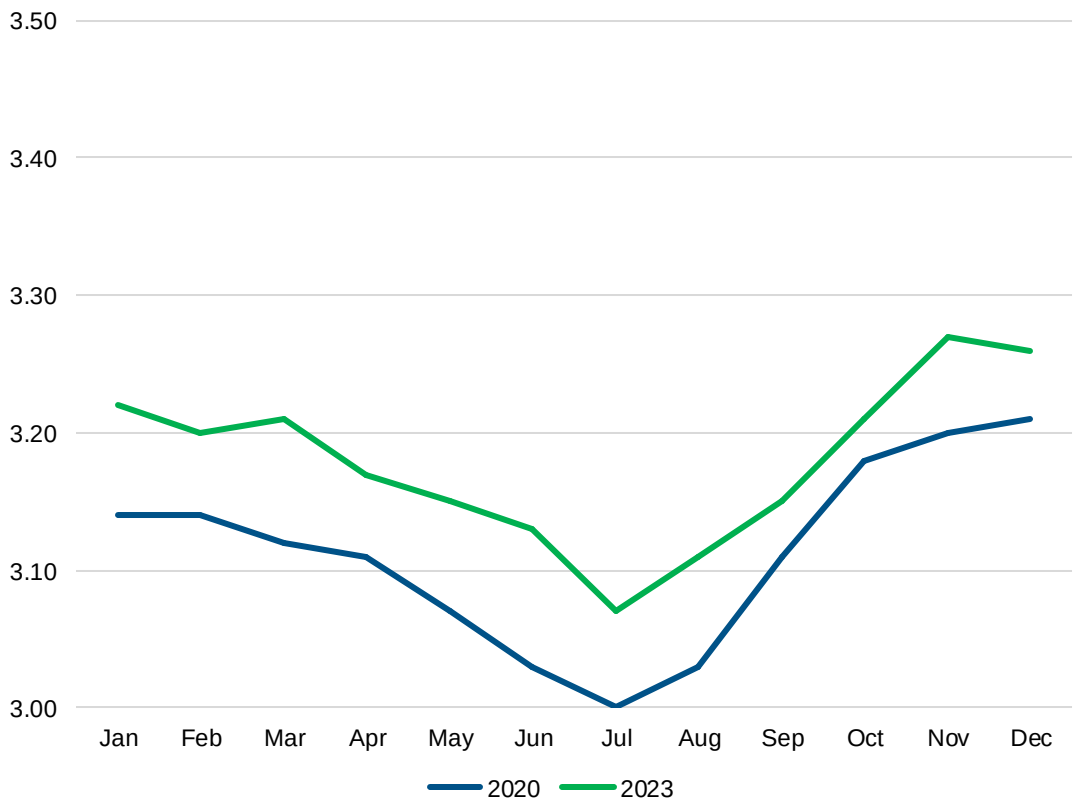
Source: USDA and Federal Milk Marketing Order data. Presentation by Corey Geiger, CoBank.

The big shift in protein levels over the past four years

FMMO protein levels from 2020 to 2023



Northeast protein levels from 2020 to 2023

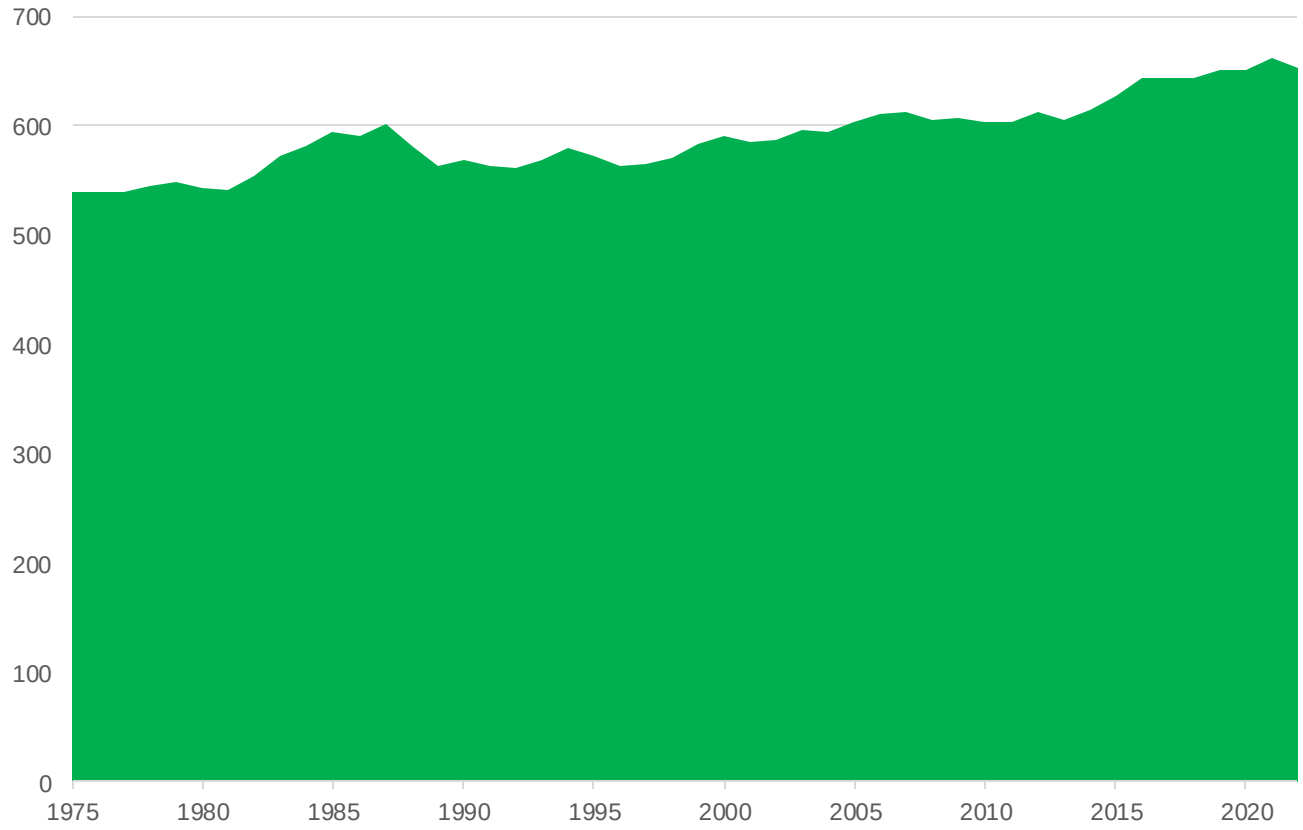


Source: USDA and Federal Milk Marketing Order data. Presentation by Corey Geiger, CoBank.

Dairy is the largest category in the supermarket

- Dairy is a $64 billion category
- Dairy tops No.2 alcohol
- 653 pounds per capita consumption
- 40 pounds — the growth rate in the past decade
- Domestic consumption, second highest since 1960
  - 2021 a record at 661 pounds

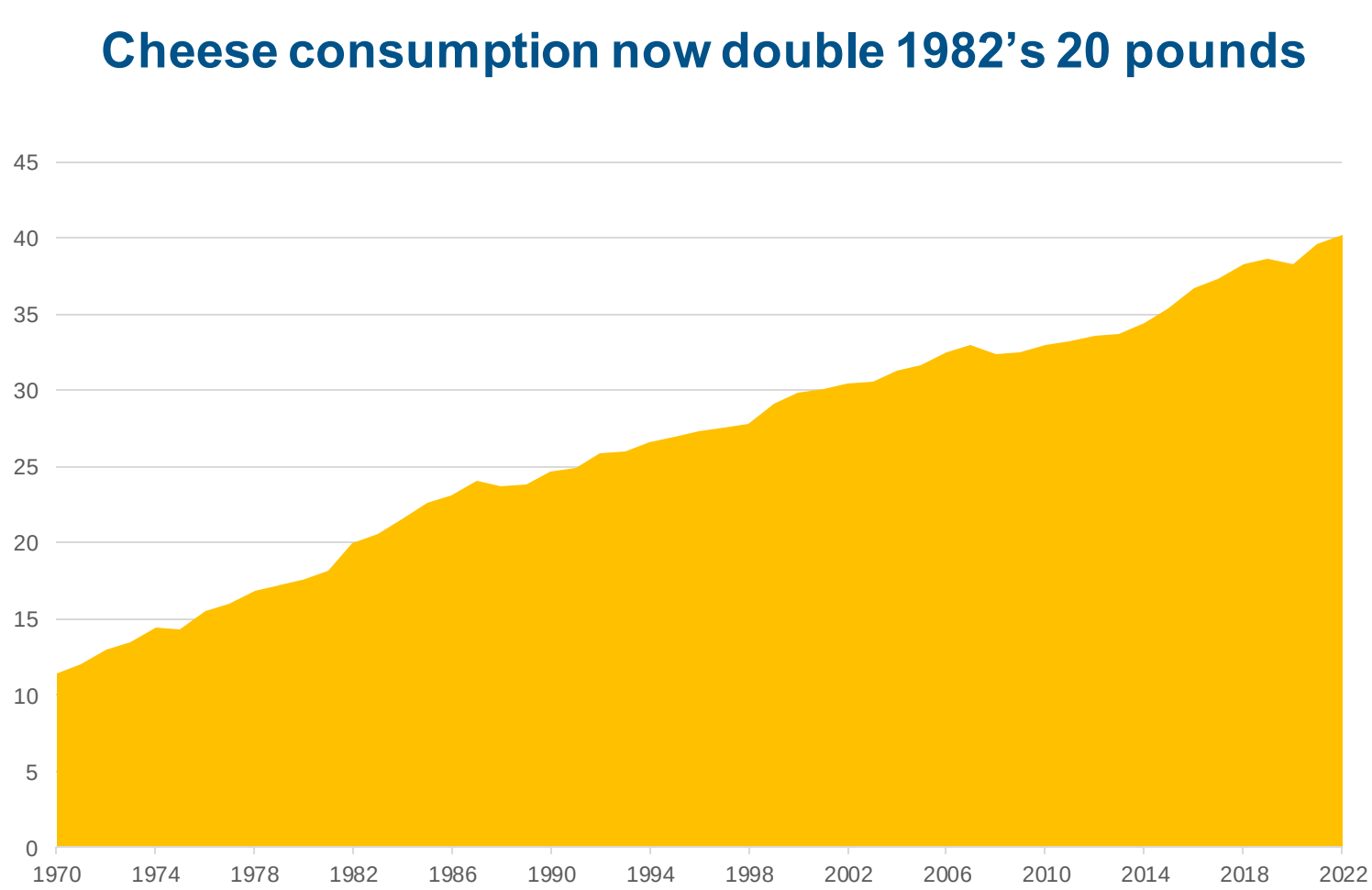
21% growth in domestic consumption since 1975



Source: USDA Economic Research Service and Circana sales data. Presentation by Corey Geiger, CoBank.

U.S. per capita cheese consumption pushes past 40 pounds

- 2022 — 40 pounds
- 2001 — 30 pounds
- 1983 — 20 pounds
- 1967 — 10 pounds
- Mozzarella – pizza cheese
  - 16 pounds in 2022
  - 10 pounds in 1995
- Cheddar
  - 11.4 pounds in 2022
  - 9 pounds in 1995
- Hispanic Cheese
  - 1.05 pounds in 2022
  - 0.33 pound in 1996



Source: USDA Economic Research Service. Presentation by Corey Geiger, CoBank.

What's the future for U.S. cheese consumption?

- Countries above 60 pounds
  - Denmark – 62 pounds
  - France — 60 pounds
- Countries above 50 pounds
  - Austria
  - Finland
  - Germany
  - Greece
  - Netherlands
  - Switzerland
- U.S. consumption will evolve differently

Every other decade a new 10 pounds – 50 pounds 2040?

Source: *World Dairy Situation,* International Dairy Federation. Presentation by Corey Geiger, CoBank.

What's the future for U.S. dairy plants?

U.S. Cheese Production

- To grow by 520,000 metric tons
- Double the growth in four years
  - 2019 to 2022 vs. 2023 to 2026

Activity in the Northeast

- $1.8 billion in investments
- Great Lakes Cheese
  - Cheese cut and wrap
- Cayuga – fluid milk
- HP Hood – fluid milk
- Wells Enterprises – ice cream
- fairlife – fluid milk

New or recently completed plants through 2026

Icon denotes forthcoming or recently completed expansion or greenfield

NMPF | USDEC DAIRY ECONOMICS Source: NMPF-USDEC Dairy Market Outlook

Source: U.S. Dairy Export Council, National Milk Producers Federation, and CoBank. Presentation by Corey Geiger, CoBank.

TikTok and the power of social media — Cottage Cheese

- Videos appearing in May
  - Sales have pushed past $1.3 billion
- No signs of fading
  - Sales value (dollars) up 16%
  - Sales volume up 7.7%

Historical perspective

- Once touted as a super food
- Peak sales at 5.2 pounds in 1972
- Sales dropped to 2 pounds in 2022
- A fad or staying power?

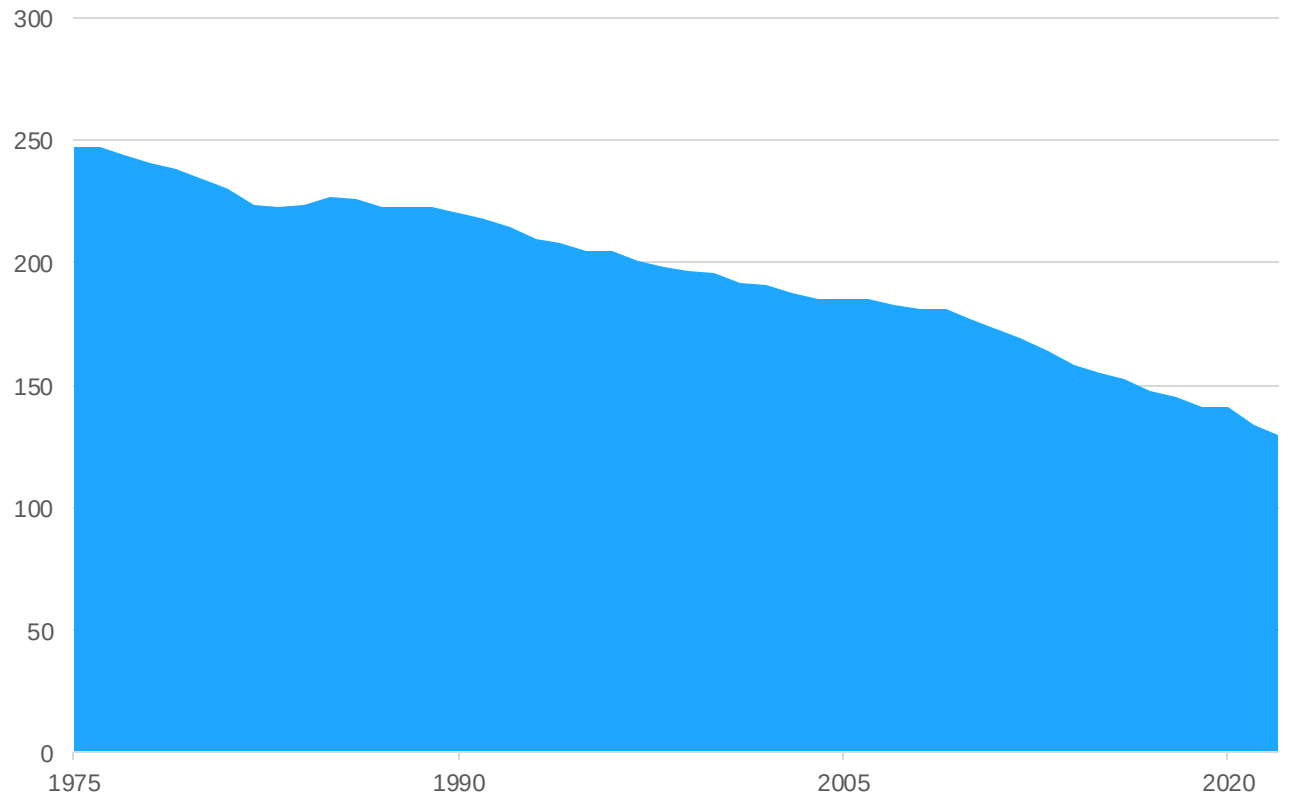
It's being added to ice cream, pancakes, and even pasta

Source: USDA Economic Research Service and Circana sales data. Presentation by Corey Geiger, CoBank.

The slide in fluid milk consumption continues

- Most fluid categories are down
- Whole milk bucking trends
  - Flavor is in the fat
  - Up 11% since 2010
- Begins with school milk
  - 37 processors, over 90% of schools
  - Agreed to reduce sugar to under 10 grams per 8-ounce serving
- Think beyond the carton
  - Dispenser
  - Aseptic options
- Whole Milk, Healthy Kids Act
  - Allow whole milk, reduced fat back in schools
  - Passed House 330 to 99 vote

Fluid milk consumption down 26.5% since 2010

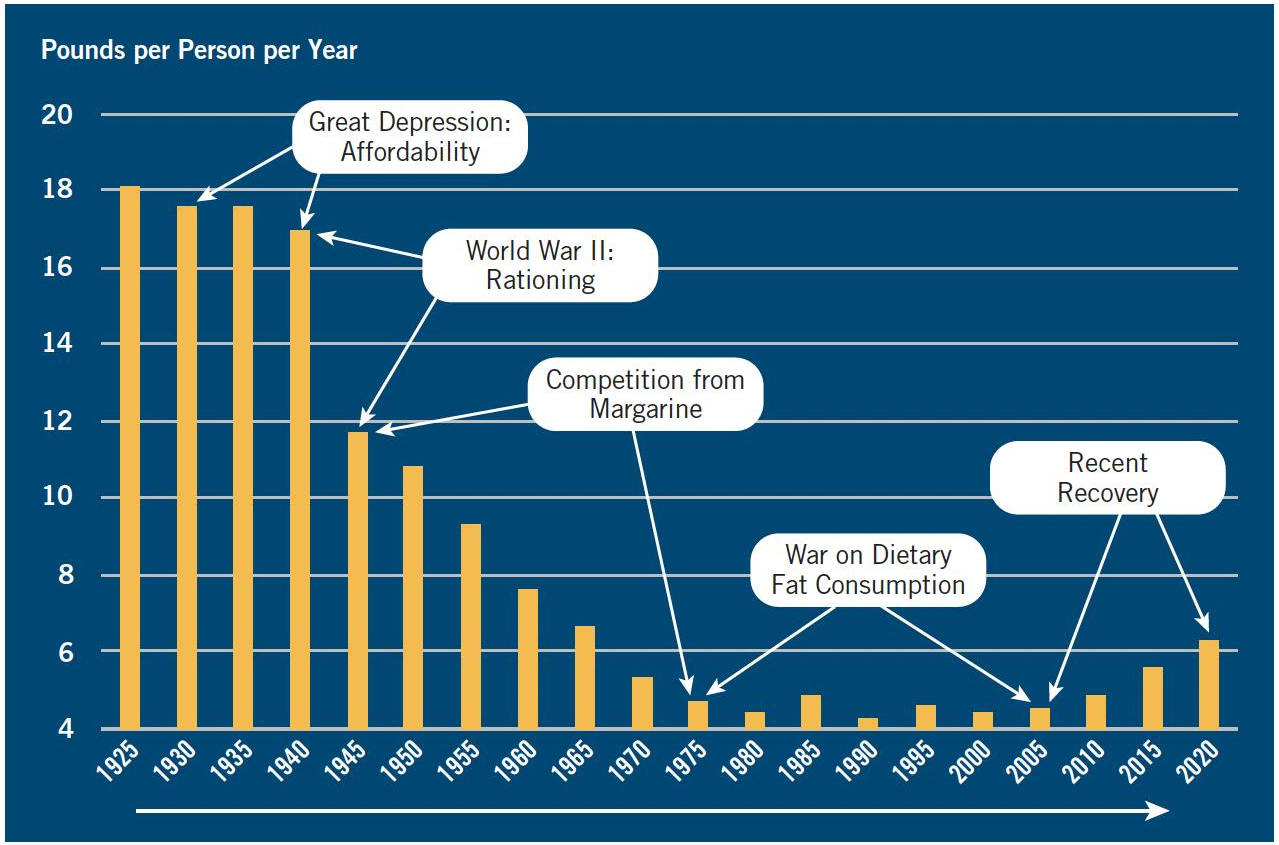


Source: USDA Economic Research Service. Presentation by Corey Geiger, CoBank.

What's the upside potential for butter?

- A rebound in taking place
- New science on saturated fats
- Butterfat/milkfat production has outpaced milk
  - Near equal from 1995 to 2010
  - 8% advantage for butterfat from 2011 to 2022
- Butter product imports have grown 10-fold in past decade
- Long-term butter product sales could be poised for growth

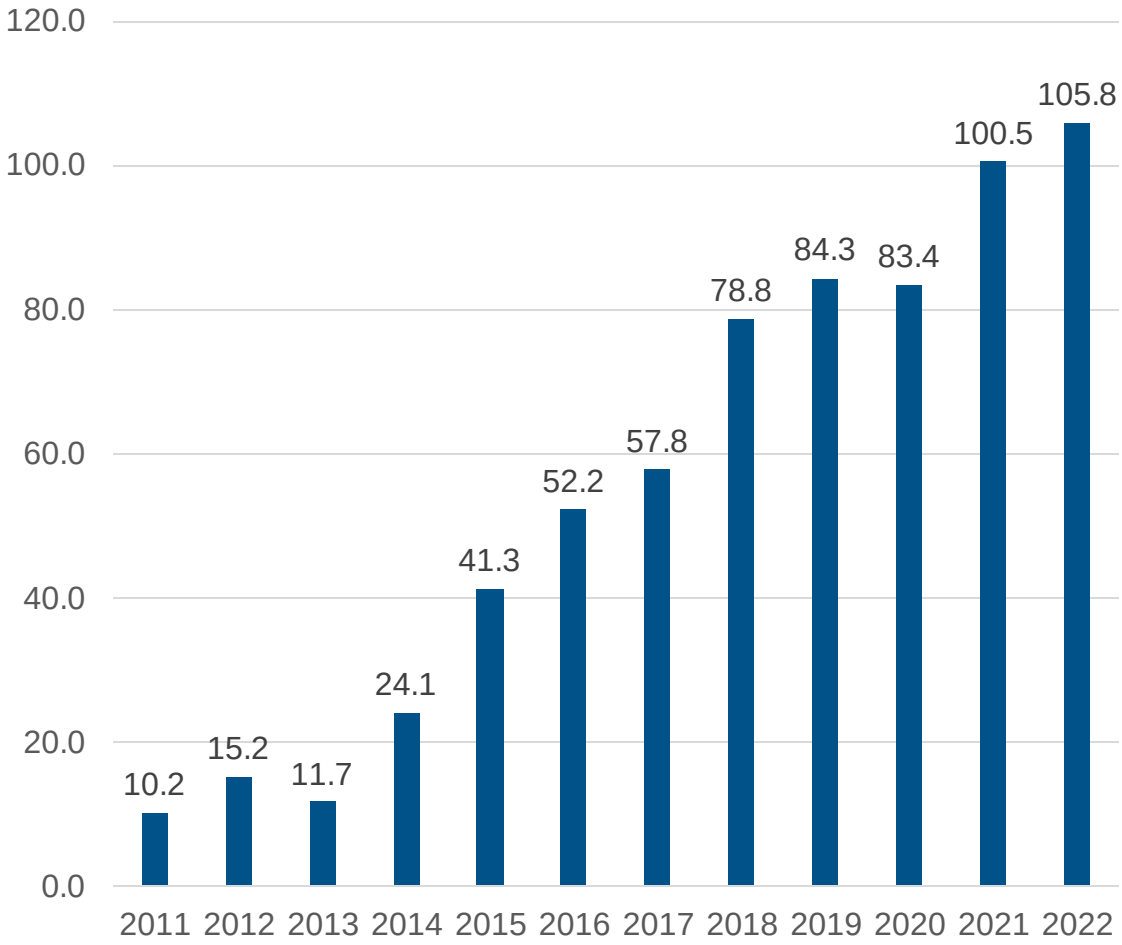
Butter consumption had better days



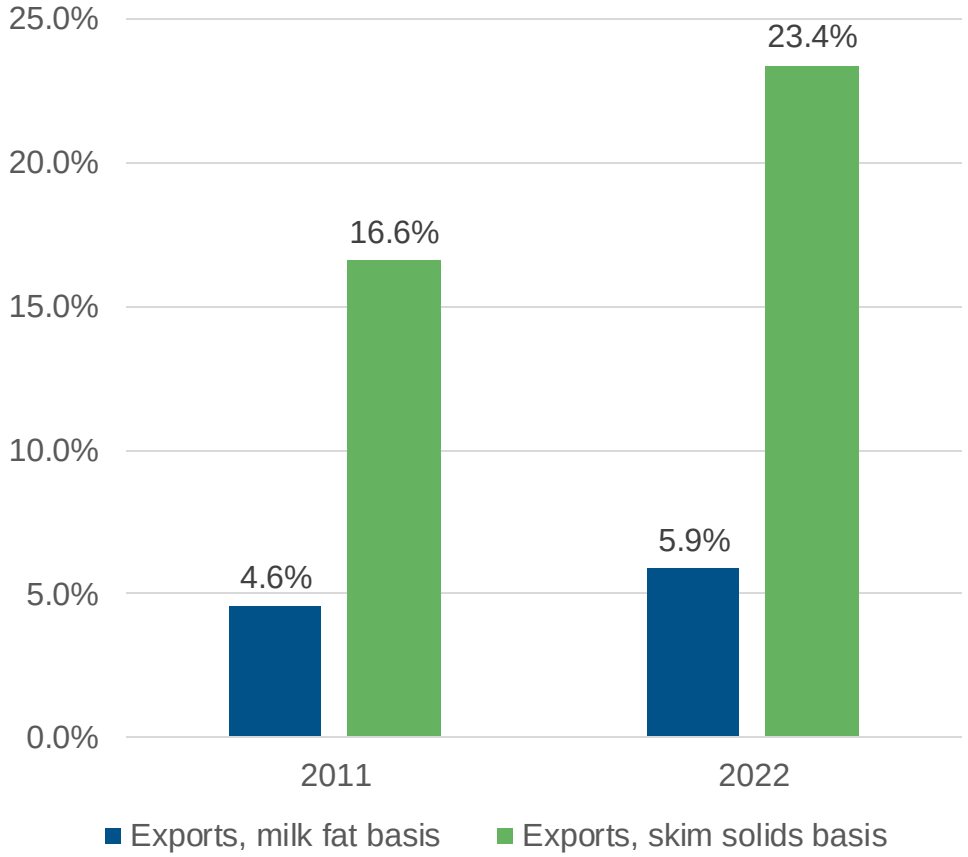
Source: USDA Economic Research Service and Peter Vitaliano, National Milk Producers Federation. Presentation by Corey Geiger, CoBank.

U.S. butterfat markets remain underserved

Butter imports have grown ten fold



Skim solids, low-milkfat products dominate dairy product exports



Source: USDA and U.S. Dairy Export Council. Presentation by Corey Geiger, CoBank.

U.S. is realizing its dairy export potential

- USDEC founded in 1995
- Exports represented 2% to 3% of U.S. milk supply in 1995
- Exports represented 16.5% to 18% of U.S. milk supply in 2023
- 5.5 days/month, cows fill export orders
- This growth took place as U.S. milk grew 45.9% since 1995
  - 2020 sales: $6.5 billion – a record
  - 2021 sales: $7.7 billion – a record
  - 2022 sales: $9.6 billion – 3rd straight record
  - 2023 sales: $8.1 billion – 2nd highest on record

Source: USDA. Presentation by Corey Geiger, CoBank.

The dairy wild card — exports and the global economy

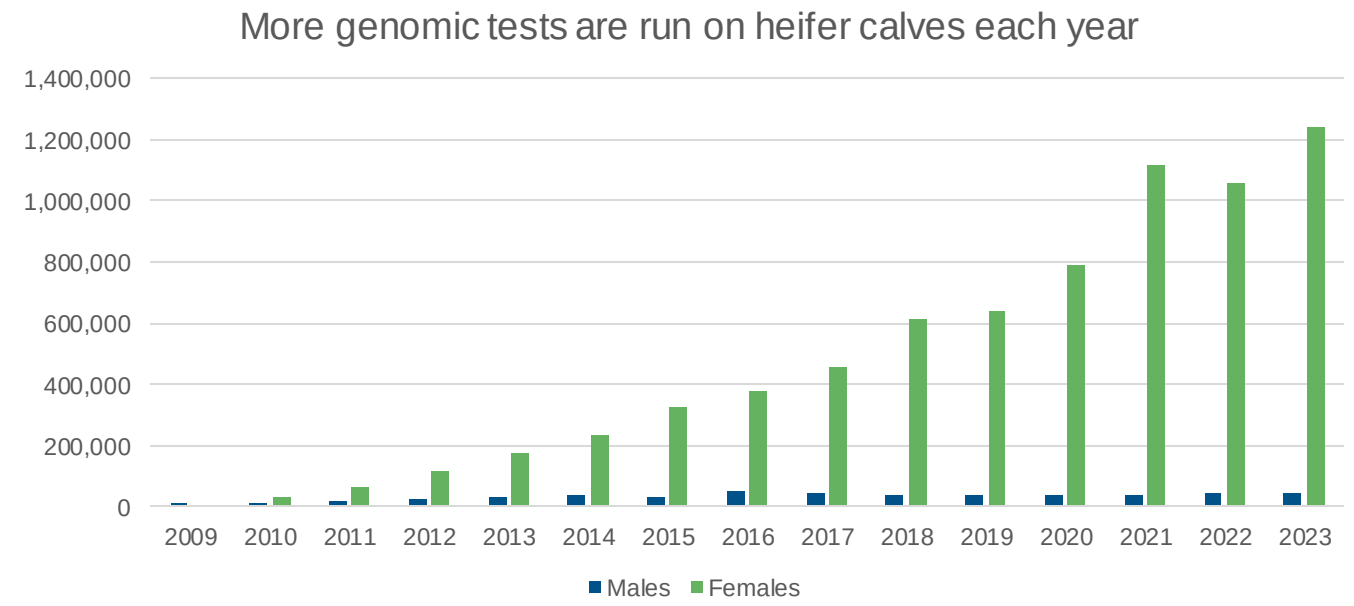
- U.S. fell back in 2023
  - 16.5% of U.S. milk in 2023
  - 18% to 19% in 2021 & 2022
    - Both were records years
  - Stronger than the static 15% exports from 2013 to 2020
- China imports 20% of the world's dairy purchases
  - Mired in an economic slump
    - 2021 GDP, 75% of U.S.
    - 2023 GDP, 64% of U.S.
      - Back to 2017 levels

If dairy demand picks up, the U.S. is poised to fill orders

Source: U.S. Dairy Export Council. Presentation by Corey Geiger, CoBank.

The dairy triple play — Sexed Semen • Genomics • Beef on dairy

- The dairy cow is most studied domestic animal
- 20% to 25% of U.S. dairy heifers have genomic tests
  - Revealing 70% of genetic ability as a cow while still a calf
- Data collection, accuracy drive predictions
- Genomic science has identified new traits
- Information fuels innovation

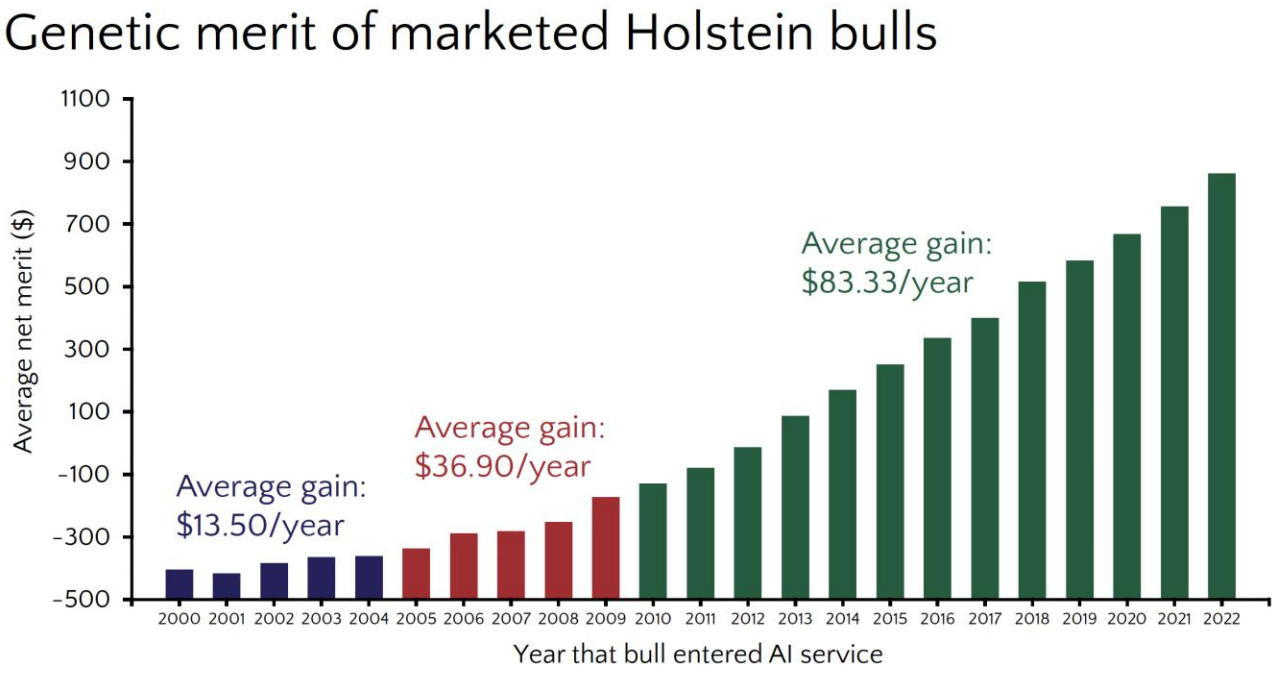


Source: Council on Dairy Cattle Breeding and National Association of Animal Breeders. Presentation by Corey Geiger, CoBank.

Dairy is doing more with less, due to genetic improvement

- Pace of genetic change
  - $13.50 from 2000 to 2004
  - $36.90 from 2005 to 2009
  - $83.33 from 2010 to 2022
- A gain in $70 per animal
- That's a $329 million net annual gain to the industry
  - 9.4 million cows
  - 4.7 million heifer calves
  - $70 per heifer calf

There a $70 gain in the genomic era



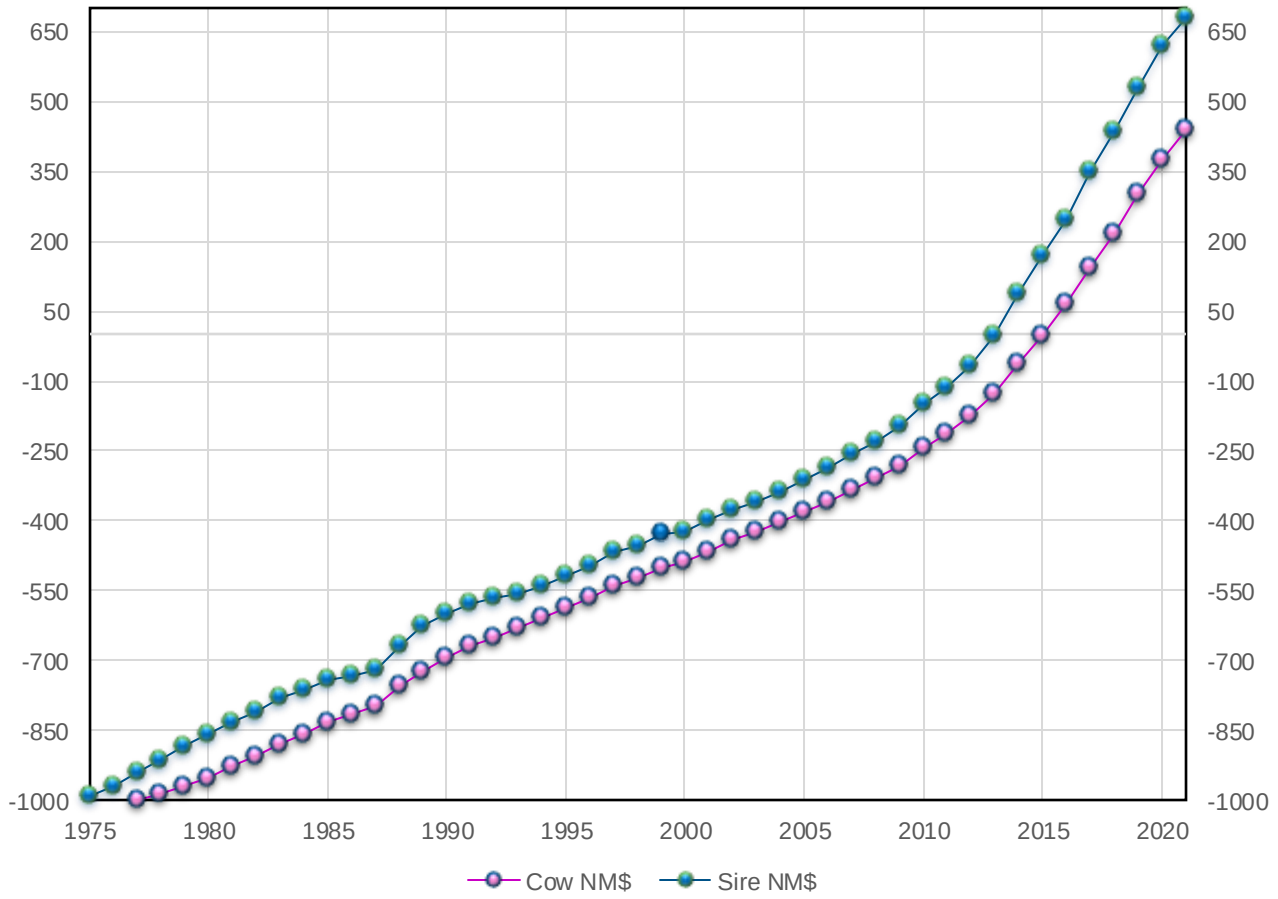
Source: George Wiggans, Council on Dairy Cattle Breeding. Presentation by Corey Geiger, CoBank.

Genetics improve dairy's carbon footprint

An example:

- Solar panels power:
  - Barns with 480 bulls
  - 72 lasers sexing semen running at 30,000 pulses per second, 24 hours a day
- Solar panels cannot compete with genetics for carbon reduction
  - 10-years of solar panels to have same carbon impact as **1 month** of genetic gains on semen sold from the 480 bulls
- Genetic gains measured by more production, better health, longer cow life

Getting more with less

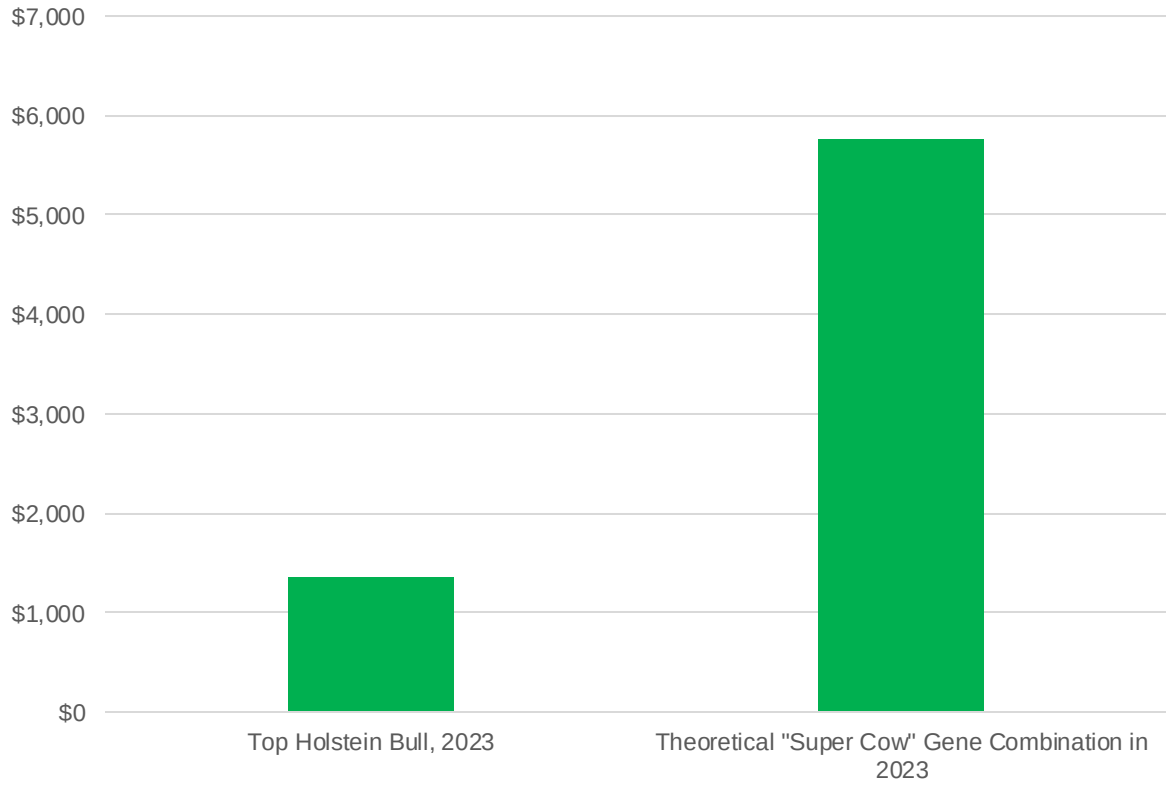


Source: Nate Zwald, COO, Genus, Chad Dechow, Penn State (graph), and Council on Dairy Cattle Breeding (graph). Presentation by Corey Geiger, CoBank.

The genetic “super cow” isn’t in sight

- Top Holstein Bull
  - $1,361 Net Merit Dollars (NM$)
- Theoretical “Super Cow”
  - $5,772
- A 300+% topside exists

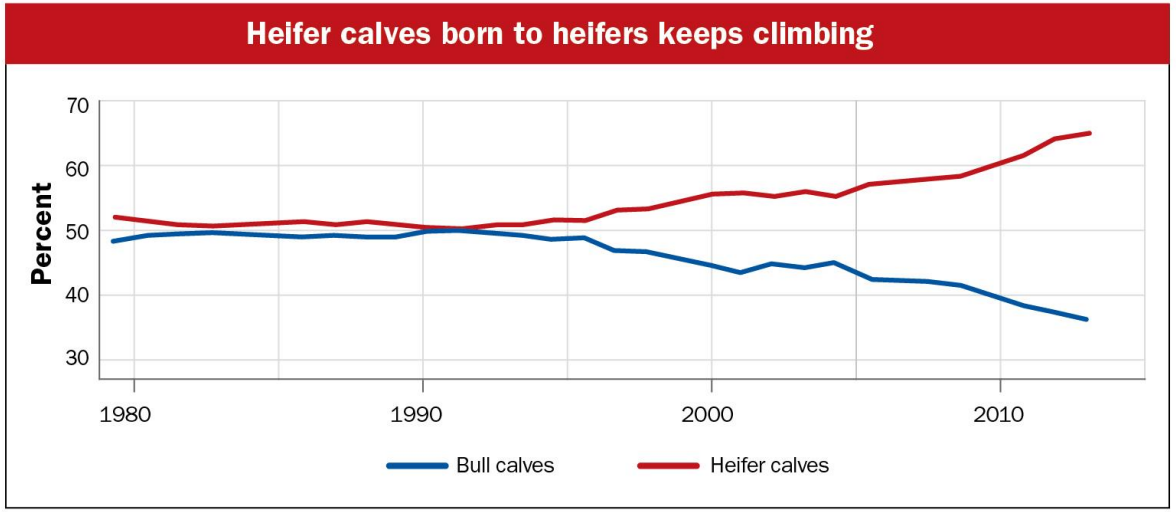
Dairy cattle genetics still have plenty of room for improvement



Source: Paul Van Raden, USDA Animal Genomics Improvement Laboratory (AGIL). Presentation by Corey Geiger, CoBank.

The dairy triple play — Sexed Semen • Genomics • Beef on dairy

- Sexed semen the start of the triple play
- First introduced in 2003
- Calving ease study
- Moving towards two calves being made:
  - The planned dairy heifer calf
  - The planned beef-on-dairy calf
- Sexed semen sales have grown
  - 54% of all semen sold in 2023
  - 8.4 of the 15.4 million dairy units old in the U.S.
  - More growth projected in 2024 and beyond
  - Conventional dairy semen now in third place
    - 8.4 million units of gender-selected dairy semen
    - 7.9 million units of beef semen on dairy
    - 7.0 million units of conventional dairy semen



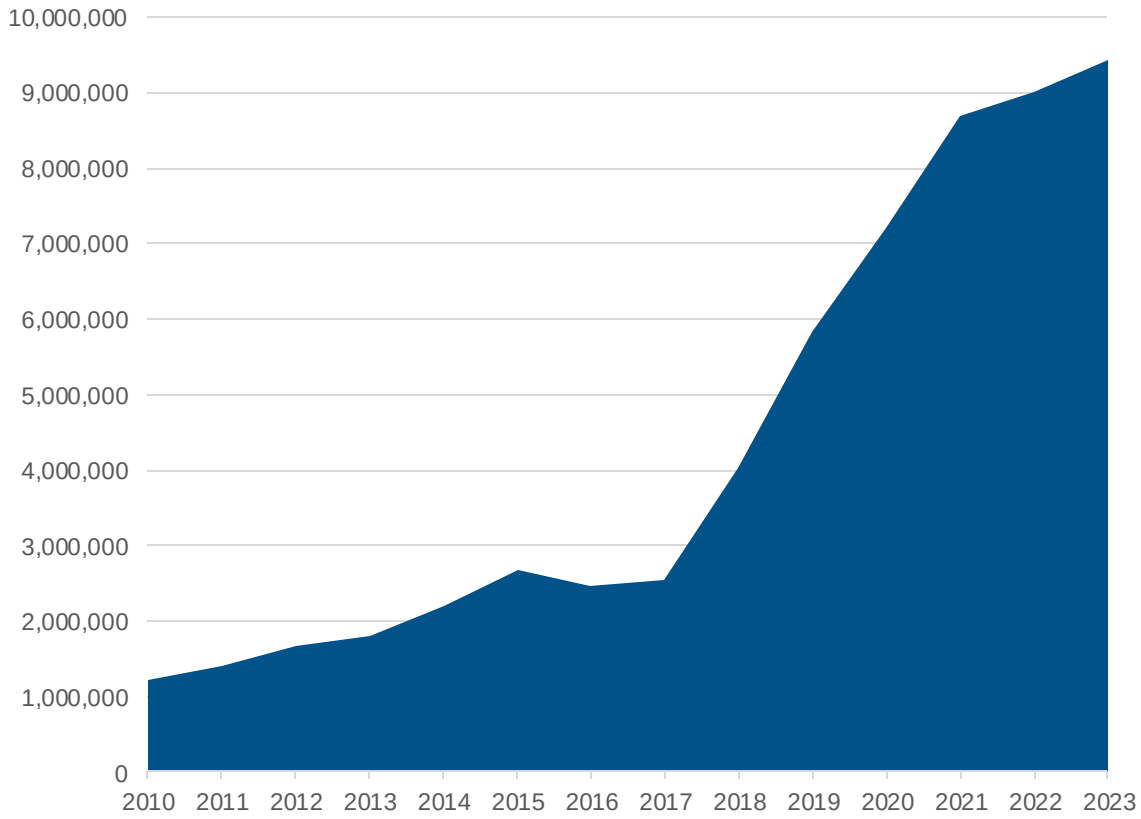
27 million births from 1981 – 2014

Source: Sales data - National Association of Animal Breeders; Graph – Council on Dairy Cattle Breeding. Presentation by Corey Geiger, CoBank.

The dairy triple play — Sexed Semen • Genomics • Beef on dairy

- Beef semen - the third part of the triple play
- Sales to dairy farmers, not beef ranchers
  - 2017: 2.5 million units
  - 2018: 4.0 million units
  - 2019: 5.8 million units
  - 2020: 7.2 million units
  - 2021: 8.7 million units
  - 2022: 9.0 million units
  - 2023: 9.4 million units
- What does this mean for livestock?
  - 2022: That's 7% of the fed slaughter
  - 2026: Could be 15% of the fed slaughter
  - There are over 3 to 3.25 million head of beef-on-dairy cross animals

Domestic beef semen sales have climbed substantially

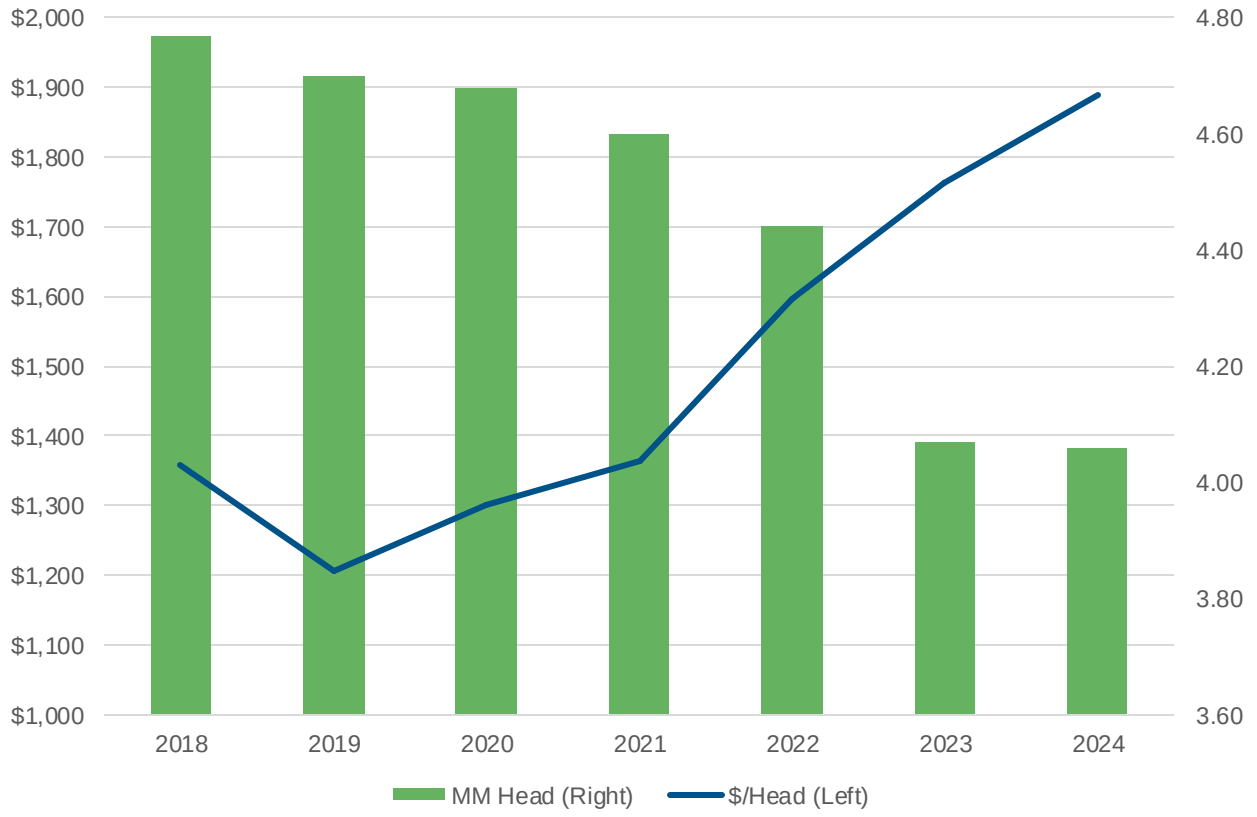


Source: Council on Dairy Cattle Breeding, *CattleFax,* Dale Woerner, Texas Tech University. Presentation by Corey Geiger, CoBank.

Replacements will be the new mitigator on more new milk

- Dairy Semen Sales are down
  - 2020 – down 1.2 million units
  - 2021 – down 1 million units
  - 2022 – down 800,000 units
- Replacements down 709,100 head in 6 years
- Revised 263,600 down in 2023
  - 2024 now off 367,000 head
- USDA average at $1,890
- Reports as high as $2,800

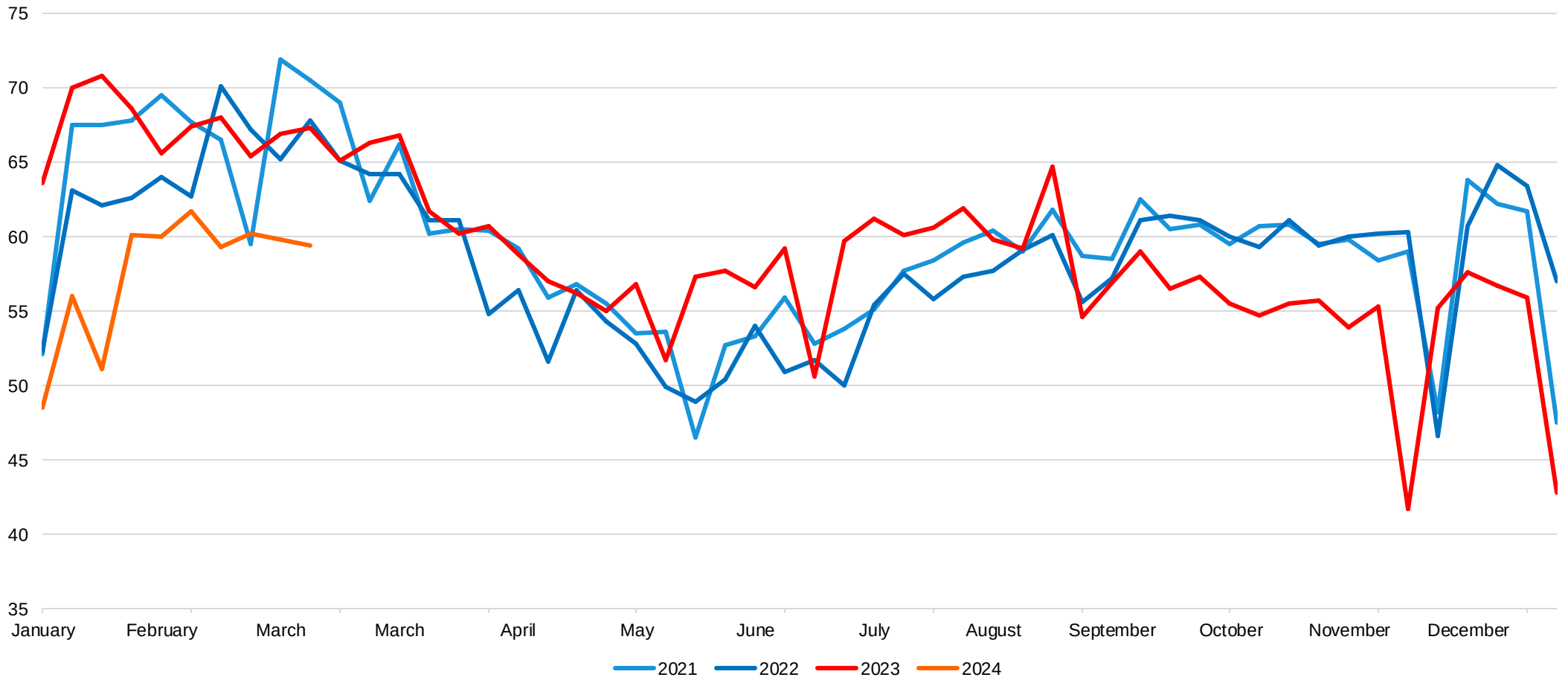
Dairy cattle replacements down to a 20-year low



Source: *Cattle* and *Agricultural Prices,* USDA and National Association of Animal Breeders. Presentation by Corey Geiger, CoBank.

Dairy farmers are pulling back on culling by 100,000 head

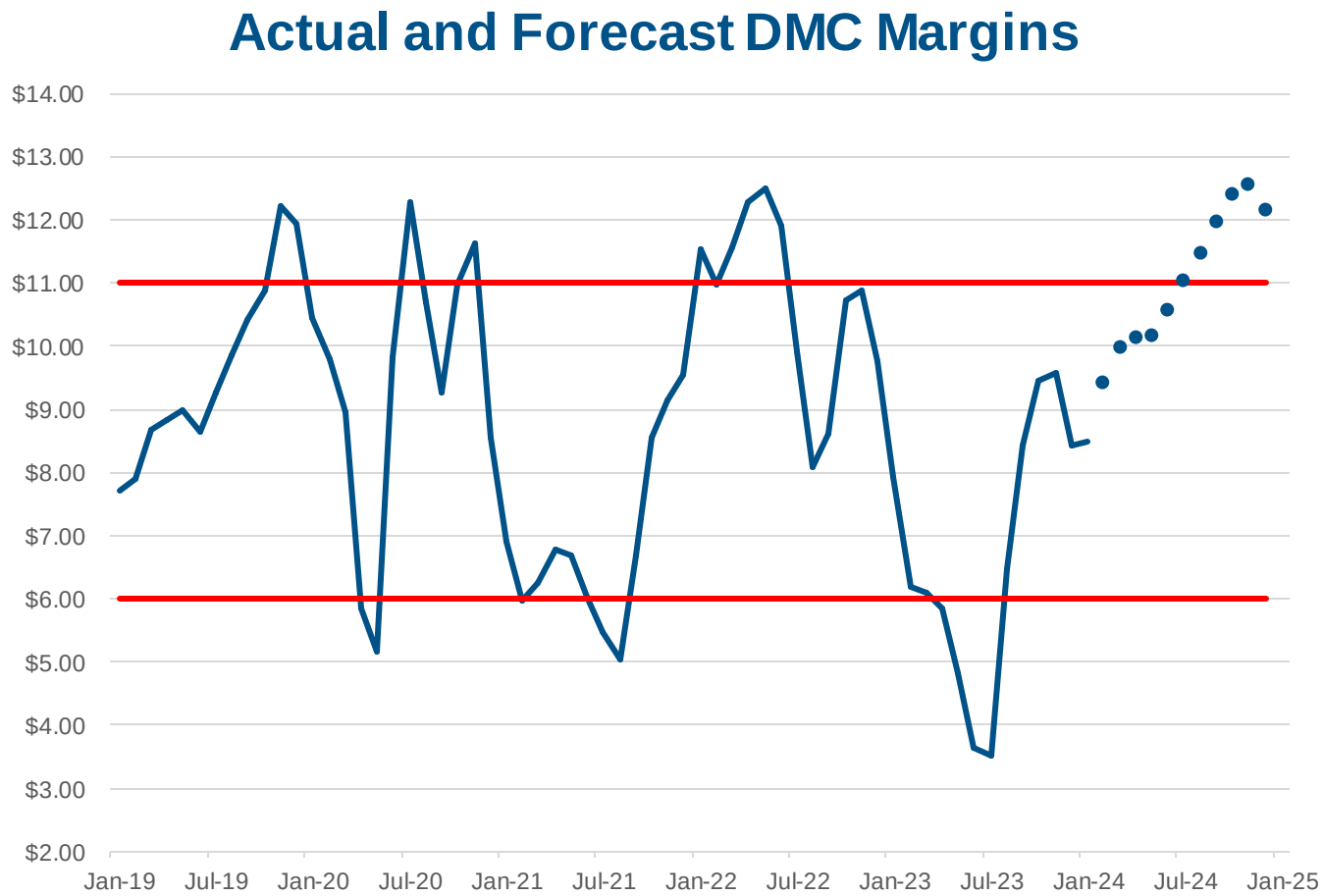
U.S. Dairy Cow Slaughter Numbers, in thousands of head



Source: USDA NASS, AMS, and the Food Safety Inspection Service. Presentation by Corey Geiger, CoBank.

Dairy margins should improve throughout the year

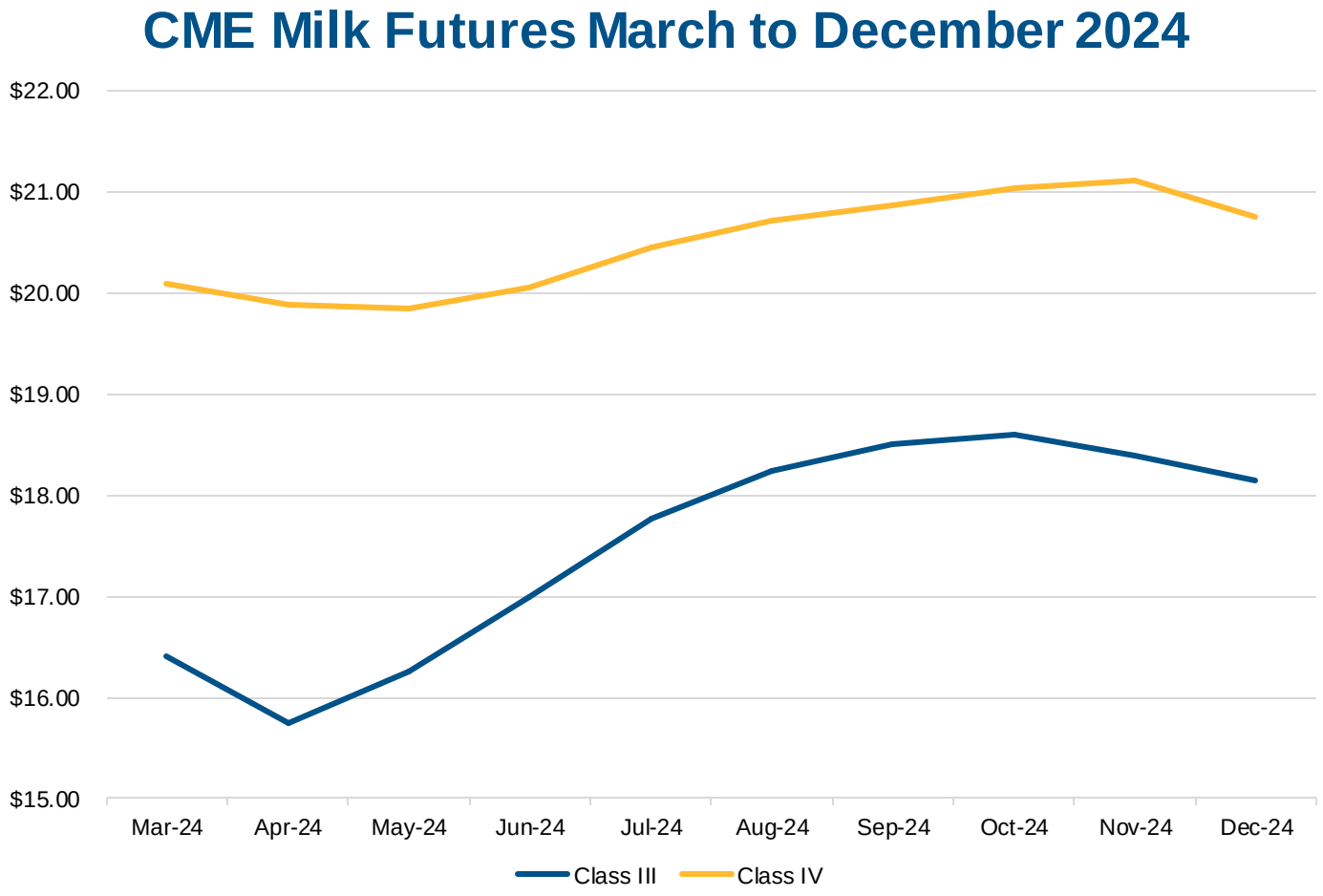
- Feed prices could improve milk margins
- $6.50 per bushel corn
  - Early 2023
- $4 per bushel corn
  - Early 2023
- $500 per ton soybean meal
  - Early 2023
- $350 to $400 soybean meal
  - Early 2024



Source: USDA Farm Service Agency Dairy Margin Coverage (DMC) calculations. Presentation by Corey Geiger, CoBank.

Overall, the 2024 milk price forecast is third best on record

- Inverted Class III to Class IV
  - Class IV butter-powder to lead
  - Class III cheese-whey to lag
  - Will be with us in 2024
  - Will it extend into 2025?
- 92% of all U.S. milk priced on components
- Butterfat led milk checks
  - 2017
  - 2018
  - 2023
  - Will lead again in 2024
- Protein topped other years.
- Manage risk: DMC & DRP



Source: FMMO data. Graph CME Futures. Presentation by Corey Geiger, CoBank.

Building Your Milk Check Add-Ons

- Add $1.40 per cwt. for higher milk fat test (4.11%)
  - January Butterfat was $3.10 per pound
- Add $0.55 per cwt. for higher milk protein (3.2%)
  - January Protein was $1.23 per pound
- Add $0.75 per cwt. with beef on dairy (2/3 cows)
- Add $0.40 per cwt. with methane digester
- Could carbon insets offer opportunity in the future?

Source: Research by Michael Hutjens, University of Illinois and Corey Geiger CoBank. Presentation by Corey Geiger, CoBank.

COVID-19 Exasperated Ag Labor Woes

What were the 2 largest years of job creation since WWII?

- 2nd: 2022 – U.S. 4.5 million jobs added
- 1st: 2021 – U.S. 6.7 million jobs added

Source: United States Department of Labor and the October 6, 2023, edition of The Wall Street Journal

Agricultural Employers Labor Solutions: People

- Future of Farm Workforce Modernization?
  - "Call it 'Food Security'"
    - G.T. Thompson (R-Pennsylvania)
  - Food security:
    - Secures America's liberty and freedom
    - Factors in legal immigration options
    - Factors in border security
  - Tough sell in 51 to 49 Senate; 222 to 212 House

Source: Corey Geiger interview with G.T. Thompson; United States Department of Labor and the September 23, 2023, *The Wall Street Journal.*

COVID-19 Exasperated Ag Labor Woes

- Key concerns — Males ages 25 to 54 in labor force
  - 89.3% pre-pandemic — 88.4% post pandemic
  - Labor participation down 1.7% 20 to 24 years old — 0.5% 45 to 54 years old
- H.S. graduation gap: 45,000 fewer boys getting diplomas
  - Boys more likely to face suspensions or discipline knocking them off track
  - Boys don't pursue help as often when they face mental health challenge
  - Boys who don't earn a high school diploma are more likely to end up in jail
  - The gap is as wide as the achievement gap between students from affluent and low-income families
  - The Math: 40-year work career X 45,000 boys = 1.8 million workers

Source: United States Department of Labor and Research by Richard Reeves, The Brookings Institute

Agricultural Labor Solutions: People, Money, & Technology

A solution from neighbors to the West — Idaho LAUNCH

- Nurture homegrown talent in high demand careers:
  - Truck driving
  - Electricians
  - Information Technology
  - Welding
  - Mechanics
  - Plumbing
  - Construction
  - Finance

Source: Idaho State Government Website and personal correspondence by Corey Geiger. Presentation by Corey Geiger, CoBank.

Agricultural Labor Solutions: People, Money, & Technology

A solution from neighbors to the West — Idaho LAUNCH

- Scholarships for these careers
  - Up to $8,000 available to graduating high school seniors in 2024 and beyond
  - Idaho's answer to battle a 2.6% unemployment rate
  - Lead supporter, Governor Brad Little (shown right)

Source: Idaho State Government Website and personal correspondence by Corey Geiger. Presentation by Corey Geiger, CoBank.

Pressing Matter of Food Security

- "The prosperity of the city is bound up in the prosperity of the farm." – former Wisconsin Governor, W.D. Hoard
- Agriculture labor should matter to everyone

The Northeast's Superpower — Consumers

- 11-state region, plus D.C.
- 16% mainland land mass
- 19% U.S. population
- The NE population has grown
  - 49.1 million in 1980
  - 50.8 million in 1990
  - 53.6 million in 2000
  - 55.3 million in 2010
  - 57.6 million in 2020
- Consumers want nutritious dairy from local farms

Source: U.S. Census Bureau Data. Presentation by Corey Geiger, CoBank.

The regenerative nature of dairy

"Every good farmer feels that he could use three times the manure he is capable of producing. If he does not supply the necessary elements of fertility, the farm goes down."
— Governor W.D. Hoard.

"Here are the three cardinal principles of dairy farming — good land, good crops, and good cows — but at the bottom lies good land and a farmer wise enough to keep it good."
— Governor W.D. Hoard.

"It has been tested and proven that we cannot raise wheat in Wisconsin. But we can raise good butter and good cheese, without killing our land, but rather enriching it." — Governor W.D. Hoard.

The regenerative nature of dairy

- Guernsey herd founded 1899
- Farm on National Register of Historic Places
  - U.S. Department of Interior
  - Historic alfalfa research
- Cost of bottling plant upgrades too high in 1960s
- Iconic farm walked away from dairy processing
- Hoard's Creamery was another separate business.
  - Shuttered in 1960s

Hoard's Dairyman Farm Creamery- the rebirth of a brand

- Took a whole new look
- Ideated product ideas
- Looked at Guernsey attributes
  - High butterfat content
  - High protein content
- Center for Dairy Research
  - It's the Midwest DBIA
  - Grant for cheese forms and equipment
- Goal was Manchego
  - Branded as Castel, it was great
  - Cost to produce was not great
  - Needed caves to ripen
  - Needed to reboot - losing money

Manchego passed the test, but it wasn't economical

Hoard's Dairyman Farm Creamery- the rebirth of a brand

- Back to the drawing board
- Refocused on a Port Salut
  - Often made with sheep's milk
  - High butterfat from Guernsey cows
  - Distinctive bright orange rind
  - Rind from annatto
- Center for Dairy Research
  - Test, Test, and Test
  - Wine bar journey
- Finally ready for a launch
  - About 2 years to launch day
  - First cheese released in 2018

Belaire, a Port Salut style cheese went to center

Hoard's Dairyman Farm Creamery- the rebirth of a brand

- Additional varieties developed
  - Sark - Butterkase style cheese
  - St. Saviour – Camembert-style
  - Hoard's Gouda
  - Governor's Select Aged Cheddar
    - The accidental cheese
- One cheese that went away
  - Dry Jack
    - Have back up coolers
- Partnering with Plants
  - Willow's Creek Cheese
  - Edelweiss Cheese
  - Gibbsville Cheese

Then came a family of cheeses

Hoard's Dairyman Farm Creamery- the rebirth of a brand

- We can't master everything
  - Hoard's Dairyman Farm Creamery
  - Two Guernsey Girl Creamery
  - Royal Guernsey Creamery
- The Chives Experience
- The Wickman Experience
  - Cheese
  - Then milk
  - Then butter
  - Then a veal calf
- Constant learning

The restaurant bundle – getting your name out there

Hoard's Dairyman Farm Creamery- the rebirth of a brand

- Constant learning
- Enter contests
  - Helps promote your product
  - Wednesday panel will share more
- Create new cheeses
  - Back to the beginning
    - Mexican-style Manchego
    - Think beyond the cave
  - Blue cheese ripened in a bag
  - Asiago-style
  - Havarti-style
- Now up to 1/3 of farm milk
- Have a home for other milk

Enter Award's Competitions

Dairy's Future Looks Bright: Opportunities for the Next Decade

Corey Geiger, Lead Economist, Dairy
Knowledge Exchange Division, CoBank

Six-Generation Farmer
Director, World Dairy Expo, 2020 to present
President, Holstein Association USA, 2019 to 2022
Director, Council on Dairy Cattle Breeding, 2019 to 2022
Editor, *Hoard's Dairyman*, 1995 to 2023

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Dairy Innovation Summit — Northeast Dairy Business Innovation Center
Marriott Hotel, Albany, New York, April 3, 2024

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