U.S. Dairy Sector at Crossroads

2019 Midsouth Ruminant Nutrition Conference

Grapevine, TX
August 7, 2019
Dr. Marin Bozic

World Milk Production Growth is Slowing Down

Source: INTLFC Stone, Reproduced with permission from Nate Donnay
U.S. Dairy Herd: Year-on-Year Declines Almost in All States

New Zealand Realizes It’s an Island
When Production Slows, Prices Accelerate...

Slowing domestic and global milk production has lifted U.S. dairy prices. Forecasted prices are $1.00-$1.50/cwt higher than in 2018. But factors inflicting pain over 2015-2018 will remain, and need to be analyzed in detail...

Minnesota Dairy Farm – Net Return over Labor and Management

Source: CFFM FINBIN
2018 – the year that broke the dam

Upper Midwest Dairy Farm Exit Rates, Year-on-Year %

Consolidation pace over time

2018 WI Exit Rate
The number of dairy farms drops 40-50% every decade, while average farm size about doubles.

Source: Dr. Bob Yonkers, IDFA based on USDA, NASS

Changes in size and management/financing model

1) “large farms” → multi-site dairy agribusinesses
2) “family ownership” → non-family partnerships
3) external equity financing → no longer relying solely on retained earnings for expansions
4) No longer constrained to one milkshed → necessary to escape local processing capacity constraints
5) Larger % of milk by dairies that are not ‘last-generation’ dairies → exists are increasingly involuntary
U.S. Dairy Herd by Size of Operation

- INVENTORY OF MILK COWS: (1 TO 99 HEAD)
- INVENTORY OF MILK COWS: (100 TO 199 HEAD)
- INVENTORY OF MILK COWS: (200 TO 499 HEAD)
- INVENTORY OF MILK COWS: (500 TO 999 HEAD)
- INVENTORY OF MILK COWS: (1,000 OR MORE HEAD)

1997: 22%  
2002: 12%  
2007: 11%  
2012: 20%  
2017: 19%


- 16% < 200 HEAD
- 22% 200 TO 499 HEAD
- 19% 500 TO 999 HEAD
- 12% 1,000 TO 2,499 HEAD
- 11% 2,500 TO 4,999 HEAD
- 20% 5,000 OR MORE HEAD

- 3% 0 TO 99 HEAD
- 7% 100 TO 199 HEAD
- 87% 200 TO 499 HEAD

<table>
<thead>
<tr>
<th>OPERATIONS</th>
<th>&lt; 200 HEAD</th>
<th>200 TO 499 HEAD</th>
<th>500 TO 999 HEAD</th>
<th>1,000 TO 2,499 HEAD</th>
<th>2,500 TO 4,999 HEAD</th>
<th>5,000 OR MORE HEAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>COWS</td>
<td>47,305</td>
<td>3,830</td>
<td>1,511</td>
<td>1,239</td>
<td>525</td>
<td>189</td>
</tr>
<tr>
<td></td>
<td>2,102,707</td>
<td>1,144,357</td>
<td>1,023,374</td>
<td>1,938,306</td>
<td>1,767,468</td>
<td>1,563,419</td>
</tr>
</tbody>
</table>
Dairy Herd Composition in 2016

Source: IFCN

Agricultural ‘consolidation’ is as old as the civilization itself

Agricultural surplus meant there was enough food around to feed soldiers, priests, artisans, government... So why are we lamenting consolidation?
### Dairy farm consolidation in United States under different exit rate scenarios

<table>
<thead>
<tr>
<th>Year</th>
<th>3%</th>
<th>7%</th>
<th>10%</th>
<th>15%</th>
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</thead>
<tbody>
<tr>
<td>2018</td>
<td>37,468</td>
<td>37,468</td>
<td>37,468</td>
<td>37,468</td>
</tr>
<tr>
<td>2019</td>
<td>36,344</td>
<td>34,845</td>
<td>33,721</td>
<td>31,848</td>
</tr>
<tr>
<td>2020</td>
<td>35,254</td>
<td>32,406</td>
<td>30,349</td>
<td>27,071</td>
</tr>
<tr>
<td>2021</td>
<td>34,196</td>
<td>30,138</td>
<td>27,314</td>
<td>23,010</td>
</tr>
<tr>
<td>2022</td>
<td>33,170</td>
<td>28,028</td>
<td>24,583</td>
<td>19,559</td>
</tr>
<tr>
<td>2023</td>
<td>32,175</td>
<td>26,066</td>
<td>22,124</td>
<td>16,625</td>
</tr>
<tr>
<td>2024</td>
<td>31,210</td>
<td>24,241</td>
<td>19,912</td>
<td>14,131</td>
</tr>
<tr>
<td>2025</td>
<td>30,274</td>
<td>22,545</td>
<td>17,921</td>
<td>12,011</td>
</tr>
<tr>
<td>2026</td>
<td>29,365</td>
<td>20,966</td>
<td>16,129</td>
<td>10,210</td>
</tr>
<tr>
<td>2027</td>
<td>28,484</td>
<td>19,499</td>
<td>14,516</td>
<td>8,678</td>
</tr>
<tr>
<td>2028</td>
<td>27,630</td>
<td>18,134</td>
<td>13,064</td>
<td>7,376</td>
</tr>
<tr>
<td>2029</td>
<td>26,801</td>
<td>16,864</td>
<td>11,758</td>
<td>6,270</td>
</tr>
<tr>
<td>2030</td>
<td>25,997</td>
<td>15,684</td>
<td>10,582</td>
<td>5,330</td>
</tr>
</tbody>
</table>

### Block-Barrel Spread is hurting Upper Midwest dairy producers

#### Block-Barrel Spread

[Graph showing Block-Barrel Spread over time]

#### Barrel Cheese Sales reported in NDPSR (4 week moving average)

[Graph showing Barrel Cheese Sales over time]
Cow Productivity Gains vs. U.S. Population Growth Rate: Implications

**Supply**
Milk pounds growth: 23,000 lbs/cow x 1% x 9,400,000 cows = 2.16 billion lbs
1.2% yield growth (276 lbs/cow or 0.75 lb/cow/day) → 2.6 billion lbs
1.5% yield growth (345 lbs/cow or 0.95 lb/cow/day) → 3.2 billion lbs

**Demand**
???
Cow Productivity Gains vs. U.S. Population Growth Rate: Implications

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Demand
*Using per capita commercial disappearance, milk in all products, skim-solids basis (no per capita consumption growth)*
542 lbs / per person x 330 million x 0.7% \(\rightarrow\) 1.25 bil lbs
560 lbs / per person x 330 million x 0.7% \(\rightarrow\) 1.29 bil lbs
*Milk-fat basis*
643 lbs / per person x 330 million x (0.7% + 0.5% per head) \(\rightarrow\) 2.5 bil lbs
643 lbs / per person x 330 million x (0.7% + 1% per head) \(\rightarrow\) 3.6 bil lbs
643 lbs / per person x 330 million x (0.7% + 2% per head) \(\rightarrow\) 4.2 bil lbs

Why was the herd *stable* since 2000?

- **Average number of milk cows in the U.S.**
- **U.S. Dairy Exports as % of U.S. Milk Solids**

U.S. Share of World Dairy Trade
*Volume*
Golden era of U.S. exports lasted until 2015, when EU abolished milk quotas

Exports growth as % of milk production growth

<table>
<thead>
<tr>
<th>Period</th>
<th>Milk-Fat Basis</th>
<th>Skim-Solids Basis</th>
</tr>
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<tbody>
<tr>
<td>2007-2017</td>
<td>13%</td>
<td>59%</td>
</tr>
<tr>
<td>2007-2014</td>
<td>34%</td>
<td>79%</td>
</tr>
<tr>
<td>2014-2017</td>
<td>-31%</td>
<td>18%</td>
</tr>
</tbody>
</table>

To keep the U.S. dairy herd stable, U.S. needs to exports 40-50% of incremental skim solids (protein & lactose). The single most important reason why U.S. dairy producers did not enjoy decent profit margins since 2015 are languishing exports. Without exports, markets need to depress the milk price sufficiently to incentivize herd contraction.

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.
Do these events confuse you?

U.S. Exports to Mexico and China
U.S. Exports to Mexico and China

Dairy Ag Imports
Exports

Dairy
Ag

U.S. Exports to Mexico and China

Dairy Ag

Imports
Exports

Dairy
Ag
Total Goods

Imports
Exports
“The current healthy state of the U.S. economy – and the recent boom in employment, including manufacturing employment – shows that the U.S. government can and should adjust trade policy as necessary to avoid the type of challenges inherited by this Administration. Trade policy, like tax policy, must reflect the wishes, concerns, and priorities of the American people – and should not be dictated by technocrats who are not responsible to Americans. The United States remains an independent nation, and our trade policy will be made here – not in Geneva. We will not allow the WTO Appellate Body and dispute settlement system to force the United States into a straitjacket of obligations to which we never agreed.”

Meanwhile in China...

[Image of a Disney character and quote in Chinese: “小熊维尼的智慧# 找到一样你所钟爱的事物，然后，永不放手。Find the thing you love and stick with it.”]

[Image of Xi Jinping and photo of Mao Zedong with text: “Xi Jinping becomes most powerful leader since Mao with China’s change to constitution. Rare acclamation puts Xi’s thought on socialism with Chinese characteristics into Communist Party’s charter and sets him on course for indefinite spell in power.”]
WASHINGTON (Reuters) - U.S. national security adviser John Bolton has vowed to further intensify the Trump administration's tough approach to China, saying Beijing’s “behavior needs to be adjusted in the trade area, in the international, military and political areas.”
“Our Sovereign Lord the King chargeth and commandeth all persons, being assembled, immediately to disperse themselves, and peaceably depart to their habitations, or their lawful business, upon the pains contained in the Act made in the first year of King George the First for preventing tumults and riotous assemblies.”

GOD SAVE THE KING

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

If that is China, what is strategy for the new Cold War?
U.S. is Energy Independent

Net energy trade
quadrillion British thermal units

1990 2000 2010 2020 2030 2040 2050

2017

history projections

Low Oil and Gas Resource and Technology
Low Oil Price High Economic Growth
Reference
Low Economic Growth
High Oil Price
High Oil and Gas Resource and Technology

net imports

net exports

U.S. is Energy Independent

1 AUTOMATION’S IMPACT ON THE JOBS MARKET WILL START TO BE FELT FROM THE MID-2020S
Share of jobs with a high potential of automation

Transportation and storage
Manufacturing
Wholesale and retail trade

0%
10%
20%
30%
40%
50%
60%
World is graying...

The world we face

• Causes:
  • change in strategic adversary and optimal neutralization strategy (Russia to China)
  • Advances in artificial intelligence / robotics and impact on labor force
  • Energy independence
  • Aging population in countries providing cheap labor (e.g. China)

• Consequences:
  • Withdrawal from Trans Pacific Partnership and Paris Climate Agreement
  • Making conciliatory overtures to North Korea, abandoning Iraq, Syria, Afghanistan
  • New aggressively negotiated bilateral and regional trade agreements: South Korea, USMCA, Japan. Southeast Asia may follow
  • Trump wins 2nd term
Implications for dairy

• USMCA will go through, tariffs will be dropped, exports to Mexico will resume, likely already in 2019
• FTA with Japan in 2019 or 2020
• FTA with Britain in 2020 – on U.S. terms
• 50% chance of deal with China in short-term. Strict implementation mechanism – U.S. to start making noise again after 2020 presidential elections
• Global recession coming soon (2020-21?) – global demand for dairy may be affected. U.S. may not import the recession.

Dairy Margin Coverage is a **massive** improvement over MPP
Dairy Margin Coverage
$9.50/cwt at 15 cents
Historical Performance

DRP Gross Indemnities (Assuming No Yield Shocks)

Insurance Strategy: 100% Class III, 95% Coverage Level, Always Protect Front Quarter

Historical Performance

DRP Gross Indemnities (Assuming No Yield Shocks)

Insurance Strategy: 100% Class III, 95% Coverage Level, Always Protect Most Distant Quarter
The road ahead

- Global and US Milk Production slowing, prices expected $1-$1.50 higher in 2019 vs 2018.

- Productivity gains, changes in dairy production models, liberalization of milk production in EU and trade disorders are factors driving consolidation in U.S.

- Recent changes in U.S. dairy safety net will likely slow down U.S. consolidation rates in Q4 2019 and later. As small dairy farms (under 300 cows) start feeling less pressure to exit, medium-size farms (500-2000 cows) will carry more of the burden for matching supply and demand, and we may see higher exit rate in this category.

- Adverse block – barrel spread will continue to burden Minnesota, and to some extent Wisconsin dairy sectors – regional exit rates likely to stay higher than national.

Thank You!

Dr. Marin Bozic
mbozic@umn.edu
Department of Applied Economics
University of Minnesota-Twin Cities
317c Ruttan Hall
1994 Buford Avenue
St Paul, MN 55108