

Dairy in Nebraska: A Direction Forward

Prepared for the Nebraska Department of Agriculture

March 2024



SWOT Analysis

SWOT Analysis

- In this section, we will use the traditional SWOT analysis framework for evaluating the situation that Nebraska finds itself in and to evaluate various paths it could take.
- The page of SWOT highlights includes what we consider the most relevant items in each category, but all items will be considered in the detailed discussion that follows.

	Helpful	Harmful	
Internal	Strengths	Weaknesses	
External	Opportunities	Threats	

Nebraska Dairy SWOT Highlights

STRENGTHS

- Wide open to animal agriculture
 - Dairy is welcomed to a vibrant livestock community
- Cheap, abundant feed
 - · Corn, DDGs, soybean meal are all readily available
- Affordable farmland
 - Large tracts of land can be purchased

OPPORTUNITIES

- Keep the water, sell the solids
 - Produce dry dairy products, reclaim water and cut freight
- Reserve milk supply
 - In the short-term, supply milk to neighboring states
- Automation
 - Robots can help solve labor issues

WEAKNESSES

- "Controlled" water supply
 - Dynamic local rules create long-term risk and uncertainty
- Far from consumers
 - Incremental sales will largely be out-of-state, adding cost
- Small, private dairy industry
 - New milk has few buyers, often leaves to get processed

THREATS

- The grass is always greener somewhere else
 - Nebraska is never the #1 place to dairy and is passed by
- Rural population continues to decline
 - While solutions to labor exist, none are easy or cheap
- Freight costs escalate
 - Shipping goods out-of-state cuts revenue



Strength: Welcoming Animal Agriculture

- As Nebraska's promotional literature touts, the door is open for more expansion of agriculture, and livestock specifically.
- Animal agriculture comes with peripheral impacts that can be a nuisance to some neighbors – noises, odors, dust, traffic, etc. In more densely populated urban areas, the neighbors don't tolerate these inconveniences well, even if the farm was there first.
- Nebraska's laws and the citizenry's tolerance of agriculture is much higher than states with higher population densities.



Strength: Existing Livestock Industry

- Nebraska has more cattle than people and is one of the top states in producing beef and pork.
- The state has the infrastructure to support animal agriculture such as large animal veterinarians, livestock haulers, meat processors and slaughterhouses, feed mills, and farm supply stores.
- Workers experienced with handling animals are available.
- New dairy farms could tap into this network, improving economic viability.



Strength: Abundant Cheap Feed

- Nebraska is a great place to grow corn, soybeans and wheat among other crops. With irrigation, more arid land is quite productive.
- The state has multiple soybean crushing plants, which for dairy producers, implies a plentiful supply of soybean meal to add protein to dairy cow rations.
- Nebraska is home to many ethanol plants. Distillers' dry grains (DDGs) are cheap, locally available and a great source of protein and energy.
- Nebraska is well suited to feed dairy cows a high forage, high fiber diet. From a sustainability perspective, this ration is known to reduce methane emissions, potentially creating a more valuable milk if a value-added buyer can be found.

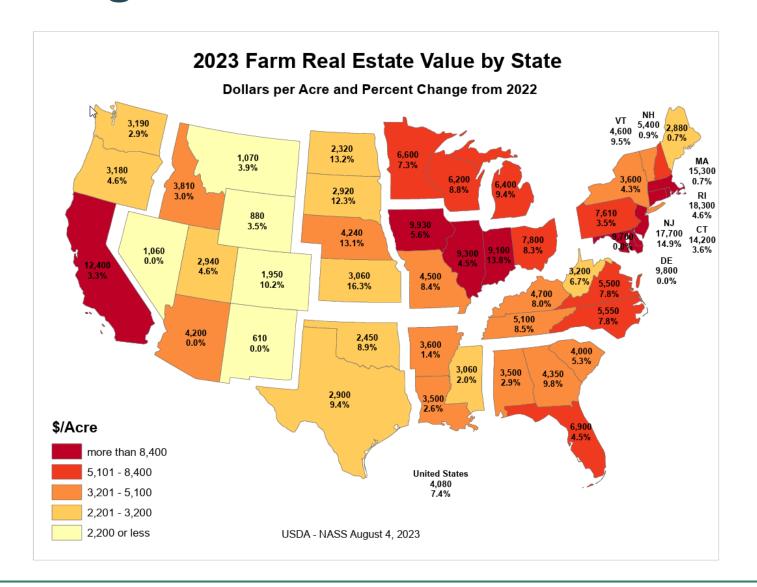


Strength: Affordable Farmland

- Nebraska is a young state that still has large tracts of land that can be acquired in a relatively short time and for an affordable price.
 - USDA estimates 2022 farm real estate value in Nebraska were \$3750 per acre. Wisconsin land cost \$5700 per acre, Pennsylvania at \$7350 and Idaho at \$3700.
- In states with a long history of farming and subsequent subdivision of parcels, farmland ownership is often fragmented. It may take generations before a property comes available for sale, making it difficult to accumulate enough land near a site for cost-effective manure application.

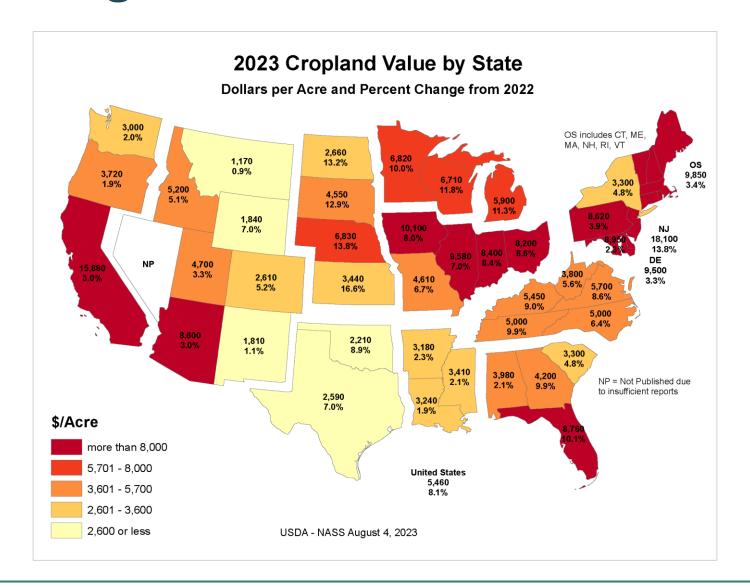


Strength: Affordable Farmland



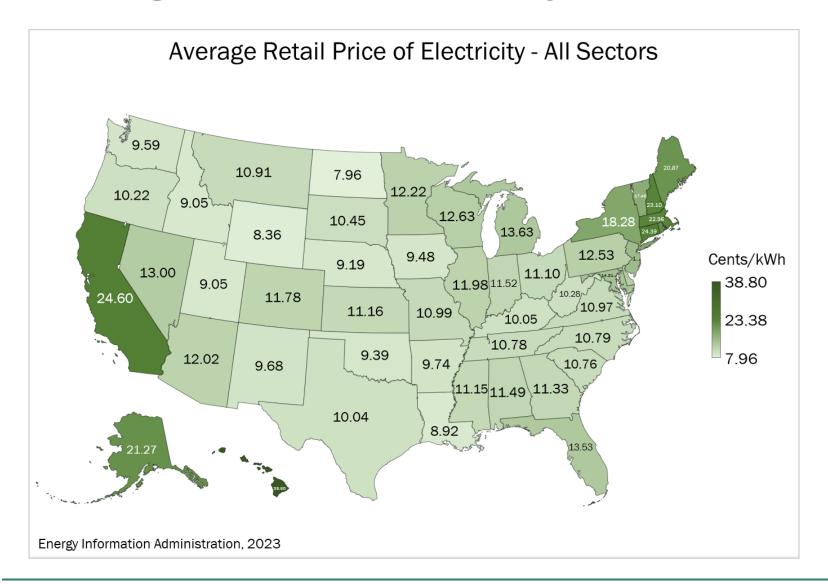
- Compared to more traditional dairy states like California or Wisconsin, Nebraska's farm real estate is more affordable.
- But the comparison may not be apples-toapples because dairy operations are more capital-intensive than beef or crop operations.

Strength: Affordable Farmland



- Nebraska has 8.6
 million acres of
 irrigated cropland,
 adding value due to
 higher productivity and
 putting land costs in
 the upper tier at
 \$6,830 per acre.
- In comparison,
 California has 13.5
 million irrigated acres,
 at a cost of \$15,880.
- New York cropland costs a mere \$3,300.

Strength: Low Electricity Costs



 Nebraska is near the low end of electricity costs when compared with other states. At 9.19 cents/kWh, Nebraska is well below the national average of 13.53 and behind only five other states (ND 7.96, WY 8.36, LA 8.92, ID 9.05, and UT 9.05).

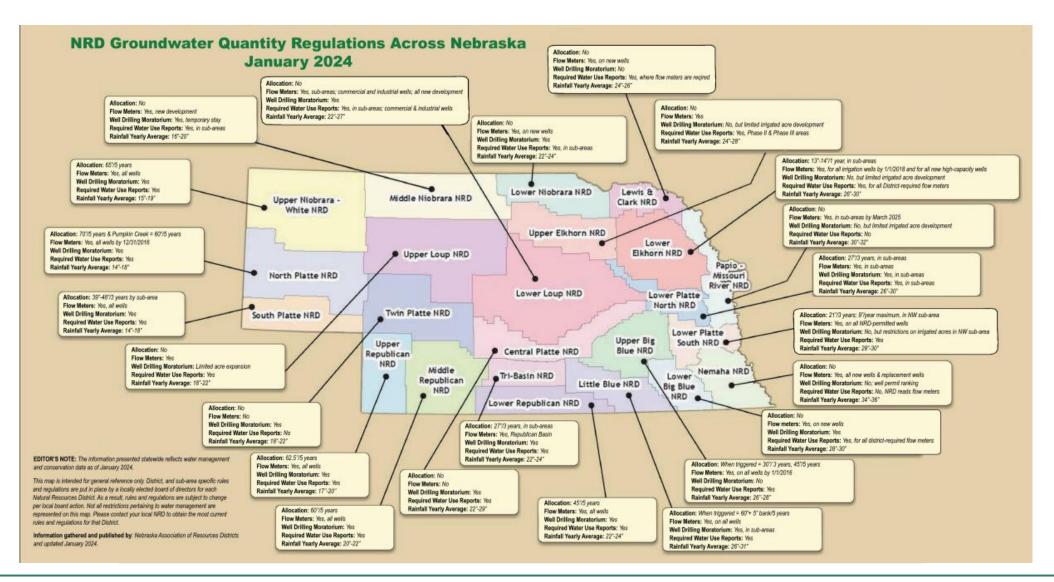
Weakness: "Controlled" Water Usage

- Nebraska's water use has a unique system of local governance through Natural Resource Districts (NRDs). NRDs are tasked with protecting and preserving natural resources, most notably groundwater. Boundaries follow natural watersheds, not political lines. Local elected boards govern NRDs. Most funding comes from property taxes, typically ranging from 1-2% of local revenues.
- NRDs work to solve local issues with local solutions. Each NRD faces a different set of circumstances. Some have an abundance of water, and therefore, impose few restrictions. Others are dealing with a shortage situation and choose to impose allocations or other restrictions on usage. Enforcement is generally effective at controlling usage. Meters on wells and limits on drilling new wells are common. Violators must account to the local board for their actions, with revocation of future water rights a viable punishment.
- NRDs appear effective at managing water, preserving both quantity and quality of water for future generations. NRDs are working collectively and across state lines to manage water in Nebraska. This is positive for current stakeholders.

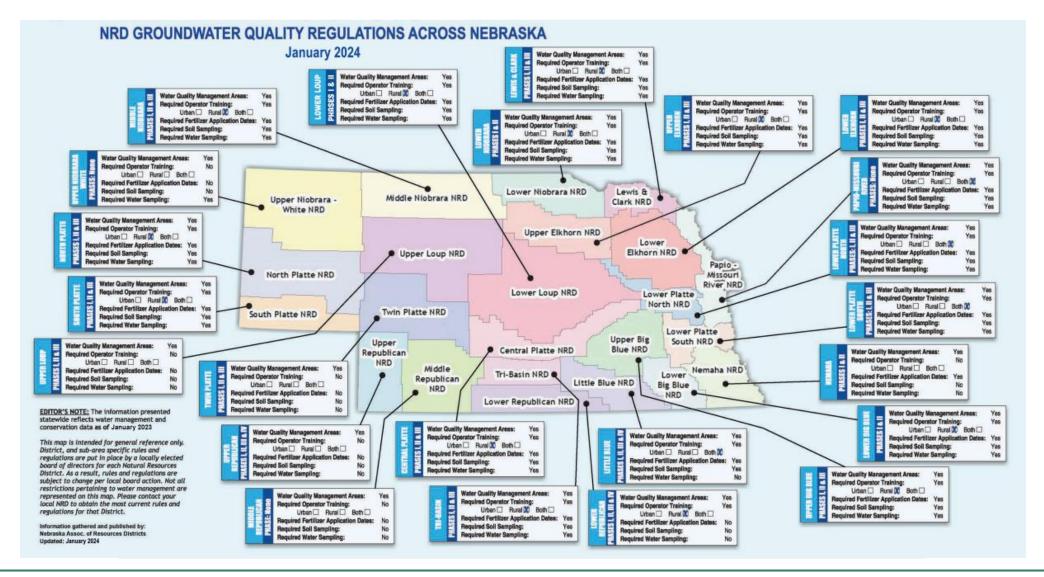
Weakness: "Controlled" Water Usage

- 1. Access to water is not a significant concern for a new processor because, most likely, a municipality will provide water and wastewater treatment.
- 2. For a new dairy producer, especially a transplant from outside the state, NRDs create challenges that make it harder to say yes to Nebraska than other states:
 - 1. Site selection is more difficult because each NRD has their own rules and regulations that must be investigated and evaluated.
 - 2. If water is controlled, a new dairy must buy land with water rights and/or obtain offsets essentially someone else's water rights to have access to the necessary water.
 - 3. Priority for water is people with industry and agriculture behind in line. Within agriculture, priority is based on seniority. In times of shortage, a new dairy may be shorted if they hold junior rights.
 - 4. Water transfer is not necessarily an easy process nor automatic.
 - 5. Enforcement appears effective with little opportunity to 'cheat the system' and use more water than allocated.
 - 6. For violators, punishment is public and significant, potentially jeopardizing the future of the operation.
 - 7. Local governments are responsive, moving quickly to address problems. That creates uncertainty about future water access. For example, in times of shortage, allocation is often a solution. While there might be adequate water for animals, water for forages and silages would likely be cut.

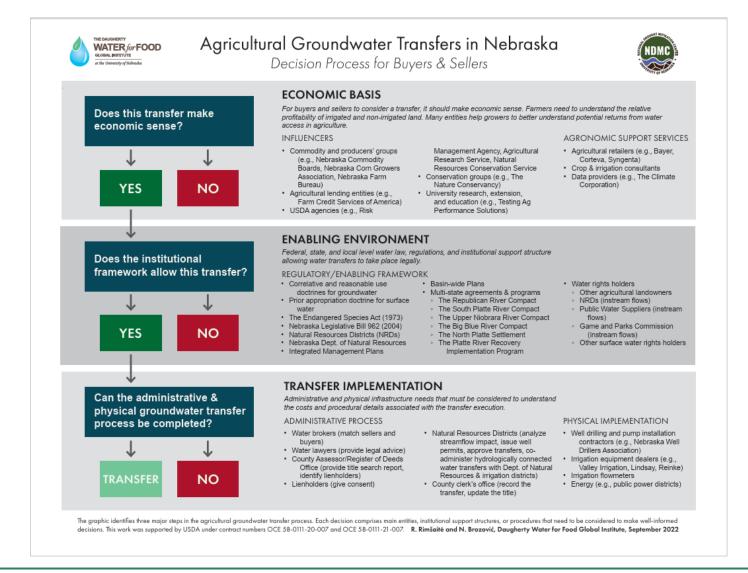
Groundwater Quantity Regulation Summary



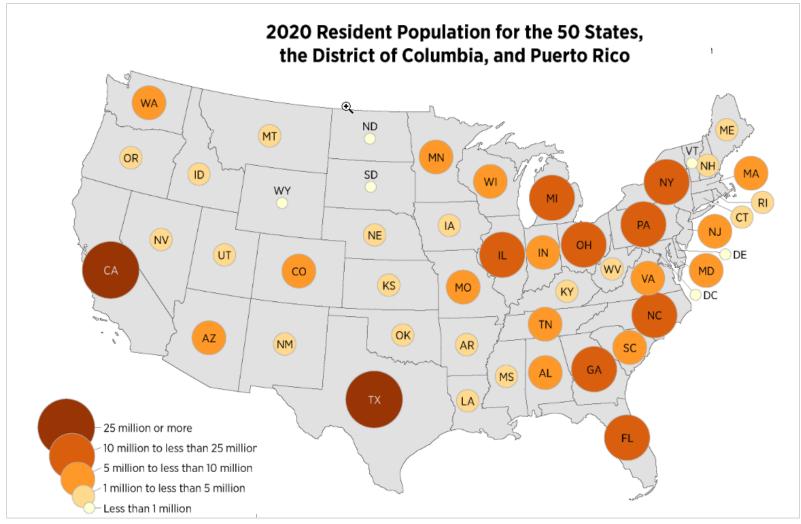
Groundwater Quality Regulation Summary



Decision Process for Groundwater Transfers



Weakness: Far from Consumers



- With just under two million people, Nebraska needs to look outside its borders to find more consumers.
- No adjacent state has more than 10 million people.
- Omaha to Chicago, while an easy interstate ride, is 450 miles away or about seven hours.

US Census Bureau (2021)

Weakness: Far from Consumers

- With most of the US population on the two coasts, Nebraska is a great central location.
- But from a finished goods perspective, transport costs are high in either direction.
 Even getting to Chicago and back is tough to do within a single driver's legal workday.
- The state's distribution network of highways, rail lines and rivers is concentrated in the South and Eastern part of the state. Some parts of the state have a longer distance to travel on local roadways before reaching I-29 or I-80, the main highway arteries.



Weakness: Small, Private Industry

- Nebraska has few dairy processors with only 10 inspected dairy plants, and of those, only five are of larger commercial size.
- Within the state, little balancing capacity exists. If there's extra milk, it generally leaves in raw fluid form to get processed, which adds costly freight and often results in a financial loss if sold. With the seasonal variation in milk supply and demand, balancing is required in some amount most days of the year.
- Private ownership often creates a culture of greater independence and competition, but less desire to serve the public good. Cooperatives own only two of the plants operated by Hiland Dairy, jointly held by Dairy Farmers of America and Prairie Farms. And even then, both cooperatives must serve interests of all members, not only those in Nebraska.

Nebraska Dairy Plant List

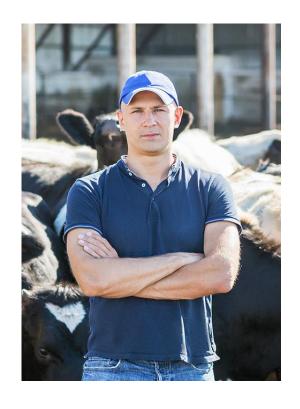
• Ten dairy plants are currently licensed by the state of Nebraska:

Company	Product	City	State	Estimated Size	
Jisa's LLC	Cheese	Brainard	Nebraska	Artisan	
Countryside Dairy	Fluid Bottling	Hartington	Nebraska	Artisan	
Dutch Girl Creamery	Cheese	Lincoln	Nebraska	Artisan	
Home Foods Inc	Beef	Omaha	Nebraska	Artisan	
UNL Dairy Plant	Various	Lincoln	Nebraska	Artisan	
Hiland Ice Cream (DFA)	Ice Cream	Norfolk	Nebraska	Small	
Hiland Dairy (DFA)	Fluid Bottling	Omaha	Nebraska	Small	
LALA U.S.	Yogurt/Sour Cream	Omaha	Nebraska	Small	
Milk Specialties	Milk Protein	Norfolk	Nebraska	Medium	
West Point (Grassland)	Butter	West Point	Nebraska	Medium	

State of Nebraska, Ever.Ag Estimates

Weakness: Tight Labor Market

- It's challenging to milk cows when there's not enough workers to staff multiple shifts every day of the year. Reliable help is necessary every day for dairy operations to care for animals.
- Because of few workers relative to the number of job openings, Nebraska's wage rate ranks as one of the top five most expensive states for farm labor.
 - Using the BLS ag wage calculation discussed earlier, Nebraska's rate is \$22.39 per hour. For comparison, New Mexico is the lowest at \$15.14. Texas employers pay \$18.11. Both New York and Idaho workers get \$19.10, although New York recently required overtime pay beyond 56 hours per week. The Dakotas rates are over \$25.
- Of concern, demographic shifts since the pandemic have not been favorable to Nebraska. Depending on the timeframe, census data indicate population trends close to flat or slightly declining, certainly not a boom of migration into the state that could ease labor supply.



Weakness: Tight Labor Market

- To be fair, overcoming a tight labor market isn't an insurmountable challenge.
- For processors, contacts in Nebraska suggest that offering a competitive wage is all that's needed. When employees compare the effort of other food processing such as meat packing, dairy would be a preferrable work environment. While the labor market would become more competitive, dairy processing attracts labor.
- For farm labor, contacts suggest that hiring foreign workers is a common solution, not just in Nebraska but around the country. Navigating visas and documentation is a known solution.
- Dairy producers with multiple facilities who are expanding into Nebraska may be able to re-locate key staff from another site.

Weakness: High Tax Rate



- According to the Tax Foundation, Nebraska ranks #30 for overall tax burden. While sales taxes and unemployment insurance rank in the top 10, property taxes are #40 in the nation.
- In comparison, South Dakota has zero income tax, so high-income earners flock there.

Weakness: Limited Markets for Dairy Beef

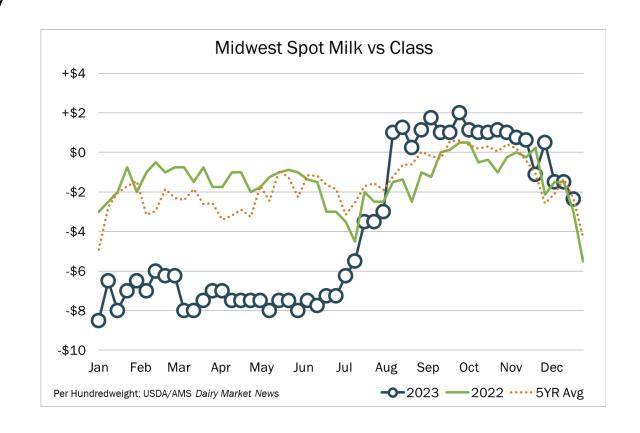
- Nebraska meat packers are used to more traditional beef animals like Angus and Hereford. These animals are bred for beef production: large muscles for high yields and marbled as consumer prefer their steaks. These animals are generally smaller in stature than a mature Holstein, and not all facilities are designed to process a large-boned dairy cow.
- Dairy cows are generally of lower beef quality and yield less when slaughtered. Most dairy animals are not heavily muscled and when culled at an older age, may have a low body condition score. UNL research says dressing percentage of a beef cow averages 63% but Penn State says dairy breeds average 56-60% or worse.
- A contact suggested that their best market was to sell cows to a Wisconsin meat packer who was in the business of processing and marketing dairy beef.





Opportunities: Reserve Milk Supply

- With the addition of new plant capacity to the south in the next two years, the Panhandle region will be short of milk.
- At the end of 2023, Midwest spot milk is much scarcer than it was earlier in the year. While this is due to a combination of factors (hot summer, farm exits), a major change is the start-up of a new cheese plant: Panhandle Products in Dumas, TX. Contacts note milk already moving south to satisfy demand.
- Buyers in Iowa and South Dakota had been purchasing southern milk at a discount. They may be open to new milk from Nebraska (but at a discount).

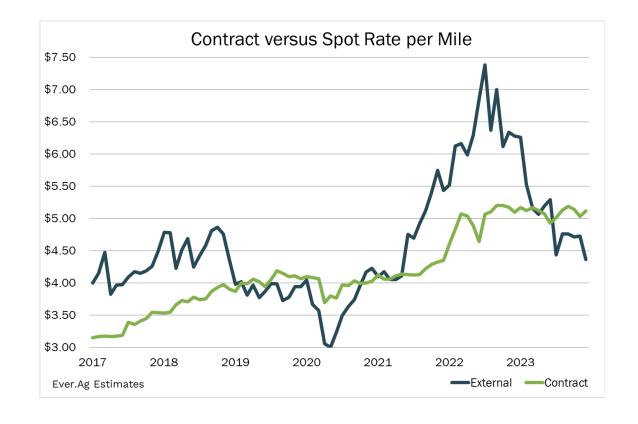


Opportunities: Reserve Milk Supply

- Michigan provides one of the best examples of a reserve milk supply at a distance from value-added markets that Nebraska could mirror.
- Michigan's valuable markets are to the Southeast, with heavy fluid milk consumption, and the Northeast, with lots of value-added production. Both markets need more milk and cream supplies than are available locally in the later summer and fall months.
- Michigan is home to many balancing operations that expect to give up milk, sometimes at a moments notice. These butter/powder plants or condensing-only facilities expect to have their own operations interrupted to gain the higher premiums of intermittent demands from dairy processors in the South and Northeast.
- A robust group of milk hauling businesses have developed in the area to support the variable and lucrative out-of-state shipments.

Opportunities: Reserve Milk Supply

- What does it cost to ship milk out-of-state? In 2023, Ever.Ag reports the average contract milk tanker rate was \$5.10 per mile. Spot rates are volatile and lane dependent, but they averaged \$5.02 per mile.
- To ship raw milk from Hastings, NE to Dalhart, TX is 468 miles, which at a contract rate is just shy of \$2400 or \$4.77 per hundredweight.
- To ship RO or UF milk at a 3X concentration factor that same lane, the freight cost on the farm milk is \$1.59 per hundredweight, a savings of over \$3 per hundredweight.



Opportunities: Storable Dairy Products

- Given the distance to most markets and the expense of hauling water in dairy products, dry dairy products are likely to be the most financially viable options for Nebraska plants.
- Nebraska's fluid bottling needs are already being met locally, so focusing more there would oversaturate a regulated fluid market.
- Dry dairy products don't have to mean low-value commodity milk powders. Manufacturers can produce higher-value powders (i.e. micellar casein, low-thermophile SMP) to return premiums to FMMO skim solids pricing.
- Milk Specialties Global is an example of an operator pursuing high-value products with its milk protein plant in Norfolk. The expansion of this facility demonstrates the financial viability of dry dairy products from Nebraska as well as value-added production.



Opportunities: Automation

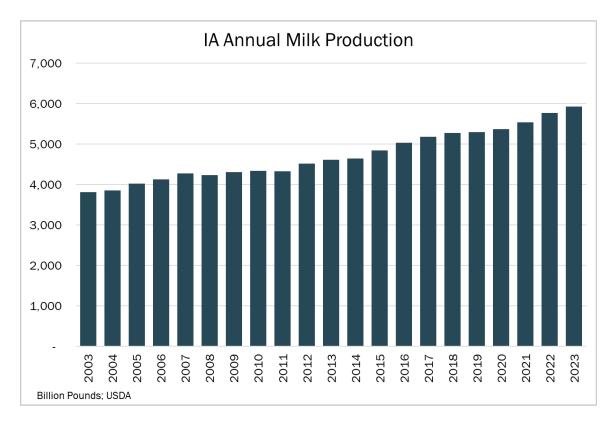
- Robotics and other automation is one way to solve the labor problem. While dairy can't do away with people, a more capital-intensive approach can minimize staff requirements.
- On the farms, robotic milking units can take the place of people. Instead, people must manage the data, care for cows and maintain the robotic equipment.
- In the dairy plants, a variety of equipment can be installed to reduce labor needs.
 The remaining jobs tend to be higher skilled as they are managing equipment and technology, not doing as much manual labor.

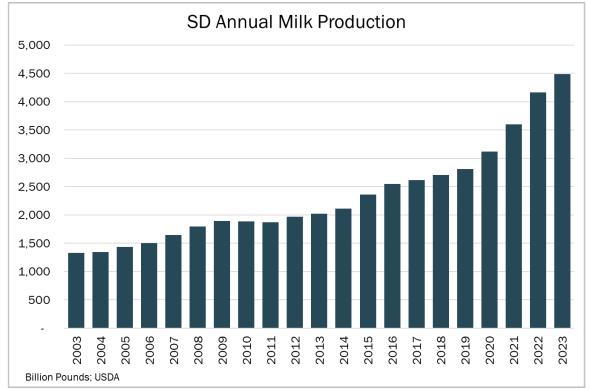


Opportunities: Leverage Neighbors' Industry

- If Nebraska wanted to focus on economic multiples generated by a dairy processor, a new plant in the Northeast corner of the state could tap the milk supply growth in neighboring South Dakota and Iowa. Those states have fewer restrictions on water and land ownership and specifically, South Dakota has no individual or corporate income taxes. A new plant would bring the manufacturing jobs and tax base to Nebraska while processing some milk from neighboring states.
- Adding markets for new milk would solve the Catch-22 and facilitate growth of dairy operations in Nebraska. New and expanded in-state operations would of an acceptable business ownership structure (not corporate). Some current Nebraska landowners would likely take the opportunity to diversify their crop operations into dairy.

Opportunities: Leverage Neighbors' Industry





Opportunities: New Beef Plant

• A new beef processing plant located in North Platte is anticipated to open in 2025. Contacts suggest that this facility is being designed with dairy beef in mind, whether beef-on-dairy crossbred steers or cull dairy cows. The expectation is that having a new buyer will increase competition and provide a better market locally for dairy cull cows.





Opportunities: Regenerative Pasture System

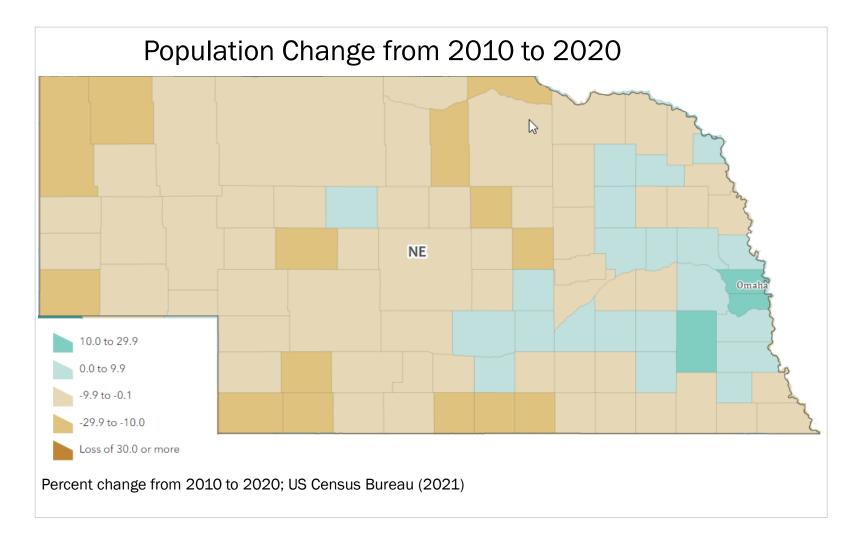
- How could a dairy farm have zero impact on the High Plains Aquifer, creating a sustainable water level? Usage must equal recharge. For land to the south and east that receives more rainfall and has milder winters, a pasture dairy system may not need significant irrigation.
- A growing group of consumers is interested in foods that can claim "sustainable" or "regenerative" as they look to reduce their personal climate impact and eat healthy foods. These consumers are often willing to pay higher premiums for the attribute.
- A high fiber, high forage diet reduces methane emissions, a further selling point of this model.
- These farms are often smaller in size due to the management requirements of grazing operations and would likely fit under the Dairy Margin Coverage payment caps, providing a financial safety net.

Threat: Other Dairy Regions

- As discussed earlier, if a region doesn't rise to the top of the list for dairy investment, potential investors pass.
- Nebraska is in the bottom half of regions considered in this study, so winning investment not a matter of marginal improvement to inch past one competitor. It would require a dramatic change in current conditions to leapfrog other regions to the top of the list.

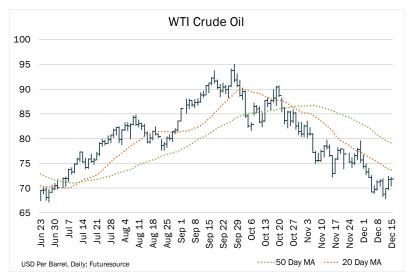
Regional Dairy Growth Outlook									
	Labor	Business Climate	Water	Feed	Dairy Infrastructure	Profitability Outlook			
Idaho									
Mideast									
I-29 Corridor									
Upper Midwest									
Northeast									
Nebraska									
Panhandle (KS, OK, TX)									
Pacific Northwest									
Southwest (AZ, NM, W TX)									
California									

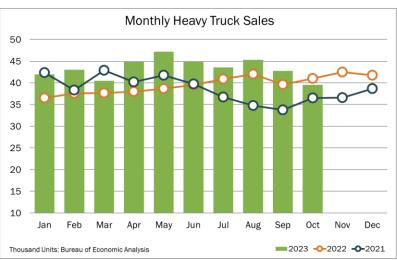
Threats: Population Out-Migration

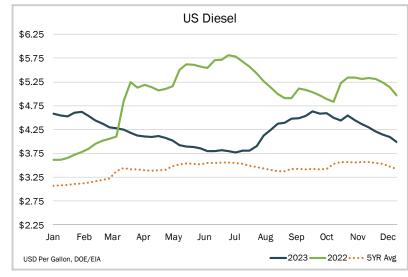


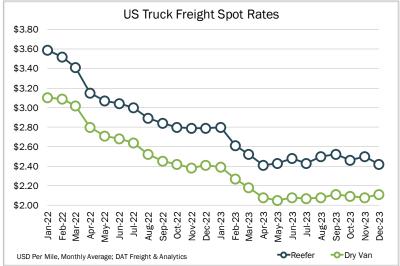
- US Census data suggests a notable out-migration from rural areas of the state.
- Especially for farms, availability of labor and the ability to retain it are concerns.

Threat: Freight Costs Escalate





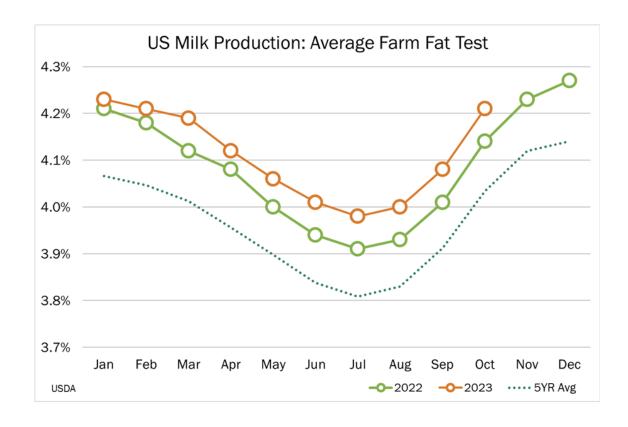




- When shipping product to distant markets, freight costs and availability of trucks/rail is critical.
- The cost of trucking and diesel is outside of the control of producers and processors. While risks can be managed, higher freight costs cut directly into revenue.

Threat: Cheese Fortification Demand

- As a distant milk supply region,
 Nebraska could use evaporation,
 reverse osmosis or ultrafiltration to
 concentrate milk solids for dairy
 processors in neighboring states.
- Cheesemakers already have equipment ahead of their vats to concentrate milk.
 Outside purchases must be lower cost than local milk plus a few cents of processing cost, so returns are limited.
- Also, there is a limit of solids that can be put in the vat when making cheese.
 As local milk becomes more concentrated, there is less demand due to less ability to fortify solids.



Threat: High Plains Aquifer Dries Up

• This is a perception problem. Already in the southern regions of the aquifer, wells are starting to go dry. Producers must make the choice to drill deeper in hopes of finding water or give up. Uninformed outsiders perceive a problem for the entire aquifer even if it's not connected to the reality in Nebraska.



USGS (2023)



Threat: Legacy of Initiative 300

• This is another perception problem. Initiative 300, a successful 1982 constitutional amendment passed by voters to restrict corporate ownership of farmland, remains on the books. While the courts ruled this as unenforceable, the belief that Nebraska isn't welcoming to large farms remains in some minds. Uninformed outsiders perceive a problem with tough anti-corporate farming laws even if it's not the reality in Nebraska.



1 NEBRASKA LEGISLATURE

 $The\ official\ site\ of\ the\ Nebraska\ Unicameral\ Legislature$



Nebraska State Constitution Article XII-8

Article XII-8

XII-8.

Corporation acquiring an interest in real estate used for farming or ranching or engaging in farming or ranching; restrictions; Secretary of State, Attorney General; duties; Legislature; powers.

That Article XII of the Constitution of the State of Nebraska be amended by adding a new section numbered 8 and subsections as numbered, notwithstanding any other provisions of this Constitution.

Sec. 8(1) No corporation or syndicate shall acquire, or otherwise obtain an interest, whether legal, beneficial, or otherwise, in any title to real estate used for farming or ranching in this state, or engage in farming or ranching.

Economic Development Assistance

Effective Use of Economic Development

- If Nebraska wants to go big, attracting large-scale greenfield processing operation(s) should be the target.
- Investment decisions these days are about more than having the merits aligned for a project. The winning location is increasingly determined by support and financial assistance from governmental entities and economic development agencies.
- How have these incentives been used effectively? We'll present a handful of recent greenfield dairy plant investments around the country to see how and how much economic development assistance has been used to effectively attract dairy plant investment.
- Our take: More money wins more investment. The vehicle is less relevant, likely dictated by local legislation and appropriations.

fairlife, Webster NY

- Public investment in the fairlife/Coca-Cola site and facility:
 - \$63.4 million: Tax breaks from Monroe County Industrial Development Agency.
 - \$21 million: Excelsior Jobs Tax Credit Program, a performance-based grant in exchange for job creation commitments.
 - \$20 million: Monroe County Industrial Development Corporation grant to fund power and infrastructure investments (still in application status).
- Infrastructure upgrades funded by governmental sources:
 - \$81.5 million: Sewer department projects and upgrades
 - Estimated \$4 million: Building a new road for truck traffic.
 - Estimated \$1 million: Expand intersection, adding turning lane to improve traffic flow.
 - Added 4.1 miles of 34.5kV electrical lines and upgrade two substations.
 - Install 1.3 miles of natural gas line.
 - Upgrade existing sewer mainline.



Mountaintop Beverages @ Morgantown, WV

- Mountaintop Beverage is benefitting from over \$100 million in infrastructure improvements funded by State and Federal sources. These projects are meant to help enable better access to the Morgantown Industrial Park, where this facility will be located.
 - \$70 million West Virginia Division of Highways committed to build a \$70 million bridge over the Monongahela River by the end of 2025.
 - \$41 million Division of Highways is also building another critical interchange, the nearby Harmony Grove exit.
 - \$2 million The project also received federal grant funding from earmarks inserted by U.S. Senators Joe Manchin and Shelley Moore Capito.
 - \$142.3 million Renaissance Academy a new vocational and college prep facility to train workers is up for local bond referendum.
 - WV Department of Agriculture staff are working with producers to increase milk quantity and improve quality while attracting more dairy operations.

Mountaintop Beverages @ Morgantown, WV

- Public Investment in the Mountaintop Beverage site and facility:
 - \$6.5 million: Forgivable High-Impact Development Project Performance Loan
 - \$10 million Loan Guarantee
 - \$25 million WVEDA Loan Insurance for real estate
 - \$15 million: WVEDA Loan 15-year term for equipment purchase
 - \$25 million: USDA Rural Development Business and Industry Loan Guarantee Program
- Morgantown Industrial Park Tax Increment Financing (TIF) District support:
 - \$21.5 million: Expanded power utilities
 - \$4.6 million: Site development

Darigold @ Pasco, WA

- This facility received over \$30 million of governmental assistance through loans, direct Federal and State contributions, as well as offsets obtained through a Tax Increment Financing (TIF) program. Some funding sources and uses include:
 - \$5 million loan: City of Pasco received a loan for water and sewage work.
 - \$7.5 million: State public infrastructure funding for developing Reimann park site (prior to Darigold's purchase).
 - \$3.6 million: Federal funding to run the last mile of railroad to the Darigold site.
 - \$9 million: Washington State TIF bond secured by projected income taxes over 20 years, allows Darigold to offset a portion of property tax to pay for infrastructure work.
 - \$2.3 million: Franklin County Economic Development Fund
 - Land purchase price was attractive at only \$22,000 per acre within a preexisting industrial park.

Hilmar Cheese @ Dodge City, KS

- Certified Sites Program: The Kansas Department of Commerce certifies sites across the state based on factors such as available workforce, access to utilities, community partners, environmental stewardship and others. This type of friction-reducing program to ensure sites are "shovel ready" is conducive to attracting investment.
- \$0.5 million: Dodge City Community College workforce development specifically for Hilmar Cheese.
- Local support was a collaboration of Kansas Departments of Commerce, Agriculture and Transportation; City of Dodge City, Ford County, Dodge City/Ford County Development Corp., Black Hills Energy, Victory Electric, United Tel•Com, Dodge City Public Schools USD 443, Dodge City Community College and local farmers.

Leprino Foods @ Lubbock, TX

- Government assistance for Leprino's Lubbock, TX facility reflects a combination of grants and significant tax abatements.
 - \$4.2 million The State of Texas' Texas Enterprise Fund (TEF), a state fund that offers cash to companies who agree to build or move operations to Texas.
 - \$350 million Leprino also sought a "Chapter 313" abatement in which Roosevelt Integrated School District will award it a property tax abatement which will extend for a decade.
 - \$20 million Lubbock City Council also extended a property tax abatement for a 10-year period, the longest amount allowed under Texas state law.
- Economic development efforts to attract the plant included: City of Lubbock, Lubbock County, State of Texas, Roosevelt School District and Texas Tech University.

Recommendations

Solving the Catch-22

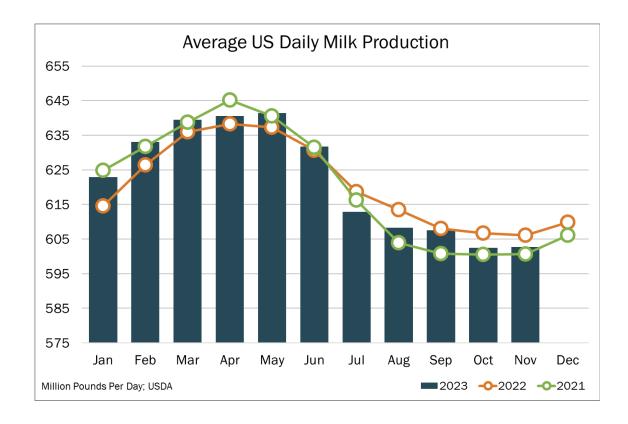
- Without a sizeable dairy processing industry demanding more milk, it is hard to attract new farms. And without abundant milk supplies, it's hard to attract new processors. If Nebraska's dairy industry is to grow, this catch-22 is the state's largest obstacle to break through.
- We recommend incenting the construction of a small to mid-size balancing plant (2-5 million pounds of milk per day), most likely with a dairy industry processor that already has a presence in Nebraska. A plant of that size would likely cost something near \$200 million and the state will need to cover a significant share of this cost.
- Also, we recommend coordinated assistance to dairy producers so a milk supply is available at roughly the same time as the new balancing plant starts up.
- By providing the initial market for milk, **the balancing plant will attract additional investment by value-added buyers**. Milk will be available for purchase it's no longer a hypothetical. The plant will also balance the farm milk supply by processing milk locally when a new value-added plant slows or takes downtime.

Solving the Catch-22

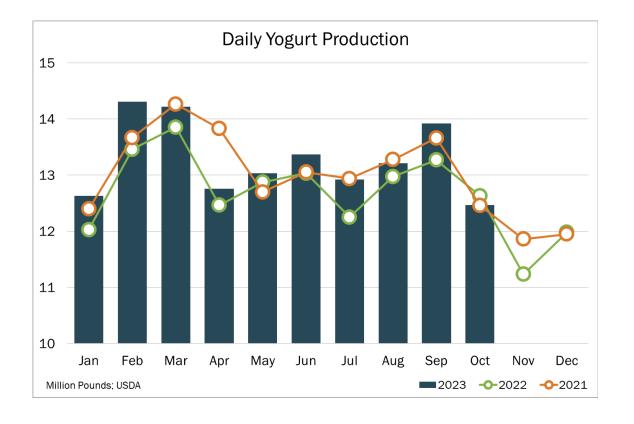
- In most other states, either processors or dairy producers seek economic development assistance to expand their counterparts. Dairy producers wanting to expand their farms lobby their legislators to help fund a new plant. Plants looking to grow cajole secretaries of agriculture to recruit new dairies. The state has a commercial partner to drive growth of the other side of the dairy equation.
- In Nebraska, we're not certain either side is aggressively seeking growth of the other. Is the impetus instead from government agencies seeking economic development and/or trade associations looking to benefit their constituents? Dairy provides a strong multiple for economic growth, so it's logical for the Department of Agriculture to pursue. Corn and soybean growers would benefit from dairy producers purchasing more feed grains and increasing basis. Other livestock industries see more business with support services and another voice in Lincoln.
- Nebraska should be prepared to incentivize multiple parties across the dairy supply chain and with large amounts of funding. If no segment is clamoring for the opportunity to make a profit, economic assistance will be required for multiple parties across the supply chain to generate the targeted industry growth.

The daily imbalance between milk supply and demand creates major challenges for the dairy industry.

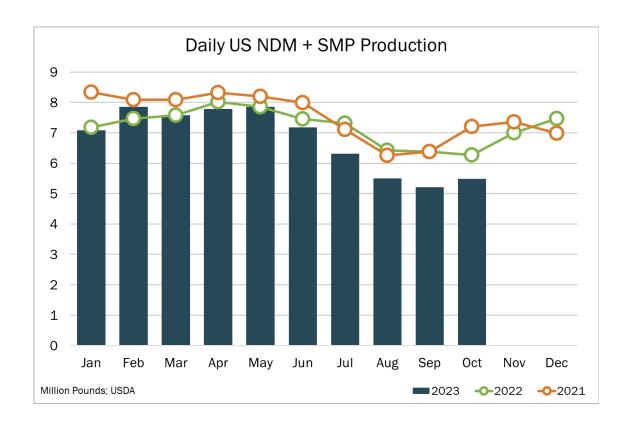
- Supply is not on-demand. It is a biological output from cows managed by thousands of independent operators across the country. It fluctuates based on weather, milk prices, beef prices, and base-excess plans among others.
- In the aggregate, milk supply peaks in the spring, slides in summer and bottoms in the fall.
- Also, cows produce milk every day, generating a near continuous flow.



- Demand for many dairy products is independent of supply. For example, schools going back in session restock their milk coolers or people eat more yogurt after the holidays to lose weight. Neither of these demand trends has a relationship to the spring flush of milk.
- All plants take downtime for maintenance. Some plants don't run on the weekends or holidays to give their staff time off.
- As a perishable commodity, raw milk has a short shelf-life and must be processed within a few days. Storing unused liquid milk may not be feasible without some spoiling.



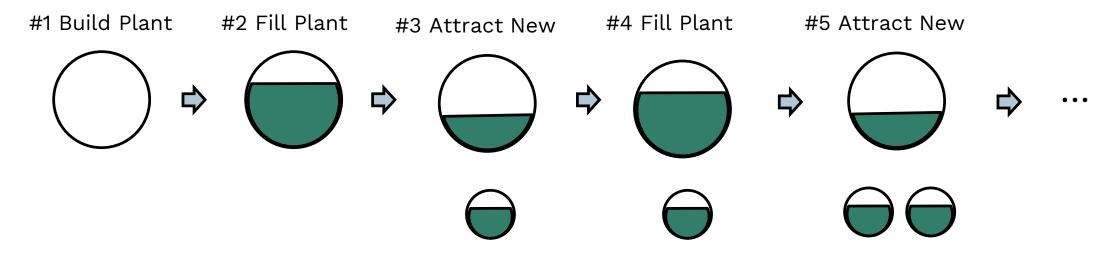
- What happens when the milk supply doesn't match demand? Milk is too valuable to dump the daily excess, and most plants can't afford to sit idle if milk isn't regularly available.
- Balancing plants help to fill the gap by processing surplus milk into storable commodities for later consumption. Butter/powder operations are the most common in large part because they are fungible and store well.
- The need for balancing is the largest in the spring. During the fall, balancing plants 'give up' milk to value-added plants for a premium, and powder production falls.



- Balancing plants have several important attributes:
 - **Products are Storable:** Butter and nonfat dry milk powder both typically have a one-year shelf life, but product may be used even beyond that date if stored properly.
 - **Products are Not Make-to-Order:** Processing needs to occur when the supply is available, not when a buyer demands product.
 - Plants Operations are Easily Turned On/Off: Butter and powder production are short processes that can be run in small or large batch sizes to absorb the daily variation in both supply and demand.
 - Relatively Low Capital Investment: Compared to a cheese plant that may run upwards of a billion dollars in today's money, powder dryers are lower cost to build.
 - Can Process Large Volumes of Milk Quickly: Especially in the spring when there's a lot of surplus milk, it's critical to process a lot of milk in a very short timeframe.

Solving the Catch-22

• Our vision for the progression of the dairy processing in Nebraska when starting with a balancing plant is as follows:



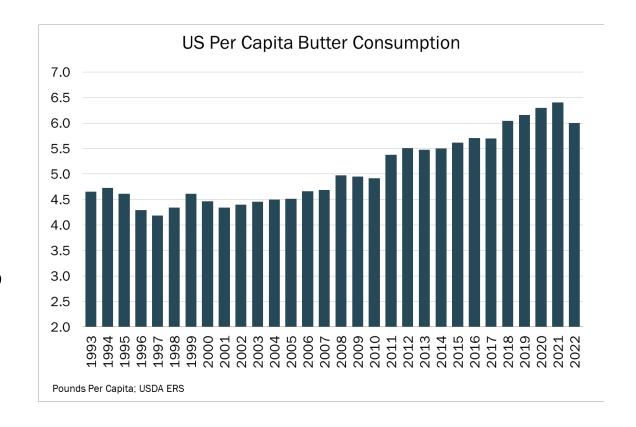
- The balancing plant is built to provide a local market for milk, allowing producers the confidence to build new operations.
- 2. As the balancing plant fills, a new value-added buyer can be lured to the area with the certainty of a milk supply on-demand.
- 3. New plant draws milk from the balancing plant, ostensibly paying a higher price.
- 4. The cycle repeats: milk fills the balancing plant and attracts another buyer.

Higher Returns from Balancing

- For this balancing plant to be viable, it can't only produce low-grade commodity powders. Examples of balancing plants that produce more valuable items are:
 - **O-At-Ka** (part of Upstate Niagara Cooperative), Batavia, NY: Produces shelf-stable ready-to-drink coffee, nutritional beverages, protein drinks and more.
 - DFA, Fallon, NV: Whole milk powder and other dairy ingredients.
 - **DFA**, Portales, NM: Specialty dairy powders, seasoning blends and other custom ingredients.
 - **Bluegrass Ingredients**, Glasgow, KY: Custom dairy powders, concentrates, seasoning blends, and other non-dairy powdered flavor products.
- For this plant to be financially viable, it needs to buy distressed milk when the market is long and give up milk when others demand it. This will provide some additional revenue to cover costs of being idle.
- Operations are likely to be very active in the spring months and over holiday weekends. The plant may produce most ingredients in a three-month span, store it in a warehouse and distribute to customers throughout the year from stock.

What About the Butterfat?

- Butterfat may or may not be processed in the balancing plant.
- Cream is a highly valuable commodity and is often shipped long distances to buyers.
- Butter features generally increasing consumption and relatively high prices.
- Nebraska has a local option at West Point Dairy, a sizable butter churn that may be able to use excess butterfat, so it may not be necessary to initially invest in this processing capacity.



Solving the Catch-22

- When making the first move to build the balancing plant, infrastructure begets more infrastructure and helps the industry to grow in a profitable direction.
- Providing market certainty for dairy producers who must sell milk every day and supply certainty for buyers is a central function of the balancing plant.
- The balancing plant provides a viable outlet for milk locally and cuts freight costs of hauling surplus out-of-state.
- Because of milk's perishable nature, the balancing plant processes the local milk until the value-added buyer is operational.
- The willingness of the balancing plant to run idle at times supports the operations of the higher-valued returns.
- Cooperatives have typically provided balancing service in other markets as they seek to provide a market for all their members' milk every day. They are inclined to say yes to more milk and are generally more willing than their private counterparts to give up reserve supplies for payment.

Balancing the Market Grows the Market

- By starting with the balancing plant, the goal is to create a vibrant dairy industry that is a better sale closer to home for dairy producers.
- This proposed path starts with a plant that can afford to be empty. It absorbs milk while local dairy production has a chance to grow. Then it gives up the milk to a higher paying sale, increasing the overall value of milk in the market. This also puts the financial investment into a hard asset, a move banks could support.
- The other alternative would be to grow the milk supply until a plant can be attracted. This implies oversupplying the market, driving local milk premiums lower, and likely subsidizing a lot of freight. Pay prices drop, hurting farm profitability in the short-run, in hopes of attracting a new plant with the cheap milk. Few decision makers look favorably on sinking money into hauling expenses, and no dairy producer is excited about a lower pay price.

FMMO Regulatory Hurdle

- The regulated pricing system with its fixed "make allowances" creates a business model that incentivizes large-scale commodity plants that run full. FMMO pricing formulas allocate \$0.1678 per pound of nonfat dry milk to cover processing costs, an efficient plant can guarantee profits if its actual costs are less. (Note that higher "make allowances" could emerge in 2024 or 2025 as the product of an ongoing FMMO hearing process.)
- A value-added plant is the other possibility. Plants could choose to produce items with a potentially higher profit margin, but some risk that the market wouldn't materialize as planned. Here, the regulatory system does not provide a backstop.
- Plants and their bankers frequently choose the low-risk business model of beating the make allowance. This has put some balancing plants in the position of not wanting to serve value-added buyers, but to instead optimize their production and reduce overhead costs per unit.
- This incentive to run full will exist for a balancing plant in Nebraska, too. The state's offer of economic assistance may need to be contingent on the winner agreeing to provide traditional balancing services to the market.

Who to Partner With?

- A downside to this recommendation is that Nebraska needs only one balancing plant to jumpstart the process and finding the right partner will be critical, potentially disappointing some stakeholders.
- As we think about who the best candidates are, our criteria include:
 - Dairy Processing Experience: This isn't an undertaking for a novice operator.
 - **Fits Into Existing Business Portfolio:** There's supplemental value to other business units from the products generated from the balancing plant.
 - Already Invested in Nebraska: The partner already has some "skin in the game" and wants to see the state's dairy industry succeed.
 - Cooperative preferred (but not required) the entity must be willing to buy and sell milk with other handlers in the future.
- While the state could court any number of dairy handlers as the owner/operator of a balancing plant, we believe that the short list of organizations that already buy milk from Nebraska producers make the cut for initial negotiations.

How Much to Spend?

- In this model, the state needs to be ready to pay for a large portion of this balancing plant, upwards of a hundred million dollars in our estimation.
 - If it was financially the best return, someone would have already done it.
 - Cooperative bottom lines are razor thin as most pay back as much revenue as possible in producer pay prices, so there's limited capital they can muster.
 - The new owner must fight the urge to singularly focus on beating the "make allowance" to cover overhead. Instead, it needs the financial ability to have idle days and low profitability of operations, so it can't carry a large debt burden.
 - Nebraska is competing with other states like Texas and New York that are
 offering millions of dollars to companies to locate in their borders.

Other Recommendations

Additional Recruitment Efforts

- This is a case where more is better. In the competition between states to win new investment, the first step is to get on the list of sites for consideration. Nebraska is already working to recruit new dairy investment and has a strong public-private working team. More resources would allow expansion of efforts and greater visibility outside the state.
- With Nebraska's strong local control of siting decisions, water rights, zoning, etc., having a local "matchmaker" support a prospect's investigation and site selection makes considering Nebraska easier and more accurate.
- Part of this need is staff and some is funding. A few points of note:
 - A contact noted that the NEDA Agriculture Promotions department has a role focused on recruitment. But there's been high turnover in that critical position as the work has a heavy travel schedule but relatively low pay.
 - I-29 Moo University does not have any Nebraska contacts ("vacant position").
 - In our google search for "Nebraska economic development" the North Carolina economic
 development department was listed first as a sponsored link.

Water Access

- As part of the additional recruitment efforts, Nebraska needs to overcome the external perception of water scarcity. While other states using the High Plains aquifer currently are challenged with water access and some Nebraska localities are constrained, other areas in Nebraska have adequate (or more than adequate) water resources. These locations need to be highlighted as part of the education and recruitment process for new dairy investment.
- With dairy being a multi-decade investment, a concern for prospective dairy producers is long-term certainty with respect to water access. Under current rulemaking procedures, this is in doubt as implementation of water allocation is common in times and places of shortage. While it may not be tenable under current rules or attractive to local stakeholders, providing some guarantee of water access would make Nebraska more attractive compared to other states.

Standardize Farm Permitting Rules

- Stories of past permit denials for siting a new dairy have far-reaching impacts. Prospective dairy producers don't need to hear many stories of contentious public hearings, expensive legal proceedings and permit denials to look elsewhere. While they may investigate another Nebraska location, it may be easier to look to another state.
- Nebraska's legislature could seek to standardize dairy farm permitting rules across the state to provide certainty. While we don't directly endorse Legislative Bill 1375, its goal is to provide timely and consistent rule-based review of new permit applications.
- For reference, Wisconsin passed laws in 2004 to harmonize local regulation of livestock facilities and subsequently experienced growth. According to DATCP employees, "The law is intended to ensure a more predictable and fairer system of local regulation... Central to the siting law are standards that local governments must apply whenever they make decisions to approve or deny applications for livestock facilities."

Increase Funding Limits

- Economic incentive programs in Nebraska span multiple government agencies: Economic Development, Agriculture, and Transportation to name a few. Generally, programs are tax-credits or cost-share programs with relatively few grants available. Many of the relevant programs have funding limits at \$500,000 (i.e. NDOT's Economic Opportunity Program, DED's ImagiNE Nebraska, Livestock Modernization program)
- Most dairy-related construction projects are very large budget projects. A
 few options to consider that would make economic incentives more
 attractive compared to neighboring states include:
 - 1. Offer more grant programs
 - Increase existing programs' funding limits to more closely match the scale of dairy processing and production investments
 - 3. Index funding limits to match construction cost inflation

Increase Workforce Development

- This is another recommendation where more is better. Nebraska is already making strong efforts to attract, train and retain skilled labor. Additional funding and resources would expand local and state programs.
- Specifically for dairy, workforce development and training programs have been offered by other states in their efforts to lure processors and producers. Training designed for a new plant's employee needs offers the opportunity to upskill workers at public cost.
- Additional training and expertise could be offered through a local public school, community college or an expansion of the University of Nebraska's dairy program.

Develop More Shovel-Ready Sites

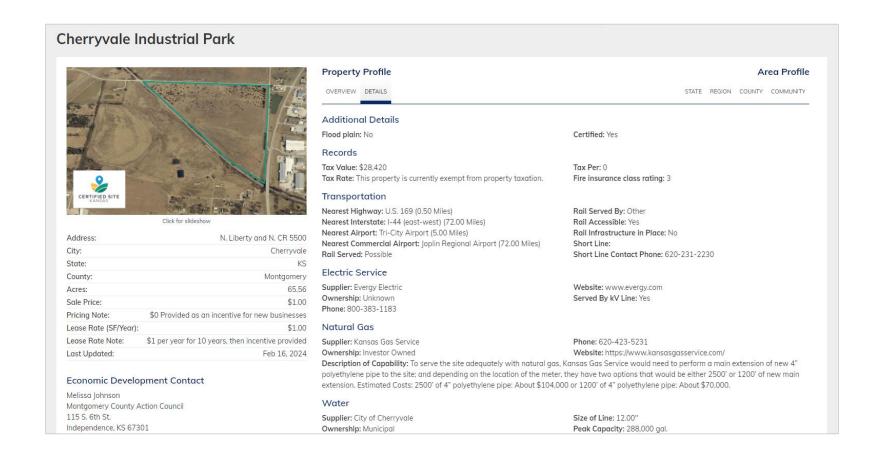
- In the effort to make it easy for new investment in Nebraska, developing "shovel-ready" industrial sites provides many advantages to new entrants:
 - 1. Know that the local community is welcoming to industry
 - 2. Local elected officials and/or economic development coordinators are often ready and willing to assist
 - 3. Property is likely to be zoned 'Industrial'
 - 4. Utility connections either exist or could be expanded to fit
 - 5. Site's purchase price may be more attractive
- These sites would support more than just dairy processing operations, so the value to Nebraska's economy would be broader.

Increase Shovel Ready Site Promotion



 The Greater Omaha Chamber's shovel ready site profiles can be used as a template for other areas in Nebraska or for developing a state-wide catalog, perhaps supported by the Nebraska Department of Economic Development.

Kansas' Shovel Ready Certified Sites



- Kansas' Certified
 Sites program
 provides an easy to-use online listing
 of industrial
 properties available
 for lease or sale.
- Details are extensive on taxes, transportation, utility service, realtor / economic development contacts and price.

Robotic Milking Machines

- Regarding specific assistance, helping farms invest in robotic milkers dramatically cuts labor requirements and elevates remaining work above manual labor.
- Robotic milkers are often more attractive to younger farmers who want more lifestyle flexibility such as the ability to watch their child's soccer game at 5pm instead of being home to milk cows.
- Robotic milkers may encourage smaller farms. One robot serves between 50 and 80 cows and the investment is scalable nicely to less than a thousand cows. Compare that to a rotary parlor where bigger is better. An 80-cow rotary parlor is more efficient than a 40-cow rotary, pushing investment from a 4,000 cow dairy to 8,000 cows. A series of smaller farms may be easier to cashflow and get operational than a handful of very large farms. Smaller farms can also benefit greatly from government risk management programs such as DMC.
- Robotic milking machines cost between \$150,000 and \$200,000 each, making this a very capital-intensive option.
- Studies show that cows produce about five pounds more per day and get fewer infections when milked by a robot.

Robotic Milking Machines

A few suggestions for the state to help Nebraska dairy producers purchase and support robots:

- 1. Partner with one (or maybe two) robotic milker company. At least ten different companies sell milking robots. By focusing on one brand, there's the opportunity for scale and efficiency. (It's the Southwest Airlines model where it only flies one type of plane.) This could provide volume purchase discounts, a community spare parts inventory, more sales and service attention from the company.
- 2. Identify a dedicated technician. Whether this individual works for the robotics company or the Nebraska Department of Agriculture, having a local technician available for timely repairs is critical to keeping farms operational.
- 3. Provide economic support for purchase. Whether the form of grants or tax incentives, the high capital cost is a sizable barrier to entry. The Livestock Modernization grants are a great start. More money, and more granted per operation per year, is needed to build new, large modern dairies with multiple robots per facility.

Regenerative Dairy Community

- To work with the natural climate of Nebraska, the state could incentivize smaller-scale 'sustainable' or 'regenerative' dairy farms. While these terms don't yet have a formal definition in the marketplace, farming practices tend to focus on protecting and building soil, grazing animals, and maximizing crop diversity. (These practices may or may not be organic certifiable.)
- There is a growing interest among consumers for sustainable and regenerative foods as there's a sense of better nutrition and doing something to help the planet. However, the consumer's willingness to pay remains limited.
- Land in Nebraska's south and east with more rainfall may be well-suited for a grazing style operation.
- While supporting a community of pasture-based regenerative farms could be a stand-alone strategy, it works best in conjunction with a balancing plant. The plant provides a local market for regenerative milk, either as the primary outlet or a place to go when the new value-added processor isn't running.

Regenerative Dairy Community

A few suggestions for the state to help create a community of Nebraska dairy producers dedicated to sustainable/regenerative farming:

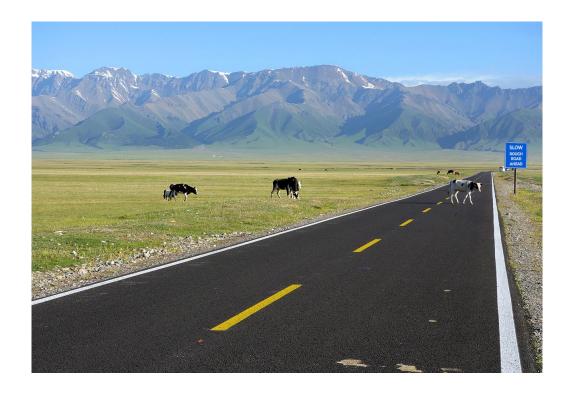
- 1. Identify a dedicated teacher or coach. Whether this individual works for the Nebraska Department of Agriculture or as a University of Nebraska extension agent, having a local 'expert' to help troubleshoot, answer questions and organize community events help provide support for new entrants.
- 2. Provide economic support to find and finance land. Whether in the form of grants or tax incentives, or even a favorable lease term on state-owned land, finding suitable land is often a large challenge for individuals who want to redesign their career and leave the city.
- 3. Recruit young dairy pioneers from universities with grazing and/or organic dairy programs to come to Nebraska. They have some practical experience and just need a shot at achieving their dream.

Should Nebraska Solve the Catch-22?

- It's easy to applaud Nebraska for seeking to expand its economy and pursue expansion of agriculture, specifically dairy, as an economic engine.
- As we reviewed the findings, our sense is that Nebraska's comparative advantage is not in dairy. To grow Nebraska dairy will likely require significant investment on the part of taxpayers as the state spends its way to #1 on prospects' lists.
- We encourage Nebraska decision makers to consider the economic multiples from other agricultural investments. Is the juice worth the squeeze with dairy?
- Looking at Pennsylvania as an example, a 2019 review of the economic contributions of beef in the state put the multiplier at 1.42. Doing the same math with data from the Center for Dairy Excellence (dividing the total sales of dairy by the direct effects) provides a 1.84 for dairy. Dairy's larger multiple is attractive and why Nebraska would consider expanding dairy's footprint.
- A similar analysis using the North American Meat Institute's 2016 data for Nebraska would indicate beef has a multiplier of 3.24. While dairy might be higher, it will require a huge expenditure to achieve. If budgets are limited, another agricultural sector might be better suited for targeting growth.

Should Nebraska Solve the Catch-22?

• If Nebraska would like to consider other agricultural sectors for investment where fewer taxpayer dollars could be spent with potentially better return for the state, Ever.Ag has additional expertise in other livestock sectors and would be willing to assist in another evaluation of how to best incentivize growth of agriculture.





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