



## **NEBRASKA AGRICULTURE TRENDS**

A compilation of recent articles, research papers, agriculture reports, etc. outlining current agriculture trends in state of Nebraska.

# THIS IS A COMPILATION OF ARTICLES AND SUMMARIES OF ISSUES FACING NEBRASKA’S AGRICULTURE COMMUNITY.

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## Nebraska's Top National Rankings

**1st Beef and veal exports, 2017 – \$1,264,739,056**

**Commercial red meat production, 2017 – 8,113,200,000 lbs. (3,680,085,616 kg)**

**Commercial cattle slaughter, 2017 – 7,463,800 head**

**Great Northern beans production, 2017 – 1,200,000 cwt. (60,962,815 kg)**

**All cattle on feed, Jan. 1, 2018 – 2,770,000 head**

**Popcorn production, 2012 – 353,711,118 lbs. (160,440,664 kg)**

**2nd All cattle and calves, Jan. 1, 2018 – 6,800,000 head**

**Cash receipts from all livestock and products, 2016 – \$12,147,375,000**

**All hay production, 2017 – 6,159,000 tons (5,587,350,814 kg)**

**Pinto beans production, 2017 – 2,115,000 cwt. (107,446,961 kg)**

**Proso millet production, 2017 – 2,349,000 bushels (63,929,308 kg)**

**Light red kidney beans production, 2017 – 176,000 cwt (8,941,213 kg)**

**Bison, number of head, Dec. 31, 2012 – 23,152 head**

**3rd Corn for grain production, 2017 – 1,683,300,000 bushels**

**Corn exports, 2016 – \$1,162,600,000**

**Cash receipts from all farm commodities, 2016 – \$21,558,070,000**

**All dry edible beans production, 2017 – 3,901,000 cwt. (198,179,950 kg)**

**4th Beef Cows, number of head, Jan. 1, 2018 – 1,910,000 head**

**Soybean production, 2017 – 326,025,000 bushels (8,872,947,146 kg)**

**Alfalfa hay production, 2017 – 3,279,000 tons (2,974,658,762 kg)**

**Land in farms and ranches, 2017 – 45,200,000 acres (18,291,791 ha)**

**5th Soybean exports, 2016 – \$1,661,800,000**

**Agricultural exports, 2016 – \$6,583,500,000**

**Cash receipts from all crops, 2016 – \$9,410,695,000**

**Grain sorghum production, 2017 – 12,015,000 bushels (305,195,090 kg)**

**Sugar beet production, 2017 – 1,437,000 tons (1,303,624,471 kg)**

**Pork exports, 2017 – \$479,016,596**

**Egg exports, 2017 – \$27,981,246**

**6th Harvested acres of principal crops, 2017 – 19,372,000 acres (7,839,570 ha)**

**Commercial hog slaughter, 2017 – 8,005,800 head**

**All hogs and pigs on farms, Dec. 1, 2017 – 3,600,000 head**

**7th Sunflower production, 2017 – 69,090,000 lbs. (31,338,697 kg)**

**8th Winter wheat production, 2017 – 46,920,000 bushels (1,276,953,240 kg)**

Source: <http://www.nda.nebraska.gov/facts.pdf>

# WHAT'S GROWING?



IN-SEASON PRODUCE CALENDAR FOR NEBRASKA

PRODUCT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Apples								A	S	O		
Asparagus				A	M							
Beets						J	J	A	S	O		
Blackberries							J					
Broccoli						J	J	A	S	O		
Cabbage					M				S	O		
Carrots						J	J	A	S	O		
Cherries						J	J					
Cucumbers							J	A	S			
Eggplant							J	A	S			
Garlic								A	S	O		
Grapes								A	S			
Green Beans							J	A	S			

# WHAT'S GROWING?



IN-SEASON PRODUCE CALENDAR FOR NEBRASKA

PRODUCT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Gourds									S	O		
Herbs					M	J	J	A	S	O		
Kale						J	J	A	S	O		
Kohlrabi								A	S	O		
Leeks								A	S	O		
Lettuce					M				S	O		
Muskmelon								A	S			
Onions						J	J	A	S	O		
Peas						J	J	A	S			
Peppers							J	A	S	O		
Potatoes							J	A	S	O		
Pumpkins									S	O		
Radishes					M	J						
Raspberries							J					
Rhubarb				A	M	J						
Spinach					M	J						
Squash							J	A	S	O		
Strawberries						J						
Sweet Corn							J	A	S	O		
Tomatoes							J	A	S	O		

# WHAT'S GROWING?



IN-SEASON PRODUCE CALENDAR FOR NEBRASKA

PRODUCT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Turnips									S	O		
Watermelon								A	S			
Zucchini							J	A	S	O		

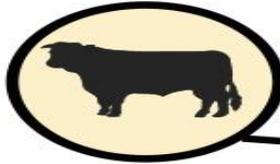
source: <http://www.ourbesttoyou.nebraska.gov/consumers.html>



# Nebraska's Top Agriculture Products

NEAGRICULTURE.COM

farmflavor.com



## 1. CATTLE & CALVES

With a total of 6.3 million head, Nebraska raises 7.1 percent of the nation's cattle herd. Beef cattle can be found in every county in the state. The sector earned \$10.3 billion in cash receipts in 2012.



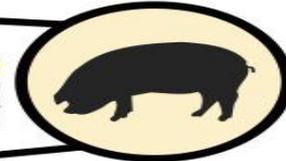
## 2. CORN

The 2012 harvest of 1.29 billion bushels earned \$8.52 billion in cash receipts. Nebraska generally ranks third in the nation in corn production. Corn for grain is usually planted from April to June.



## 3. SOYBEANS

Nebraska farmers harvested 4.9 million acres in 2012 and generated \$3.02 billion in cash receipts. The state annually ranks in the top five in the nation for soybean production.



## 4. HOGS

The pork sector earned \$888 million in cash receipts in 2012. Nebraska generally ranks sixth in the nation for pork production, and the sector supports more than 11,000 jobs.



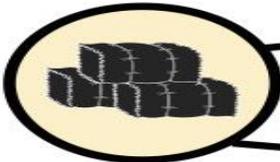
## 5. WHEAT

Farmers harvested 53.3 million bushels in 2012. Cheyenne County, in the Panhandle, ranked No.1 for production. The state's wheat sector earned \$414 million in cash receipts in 2012.



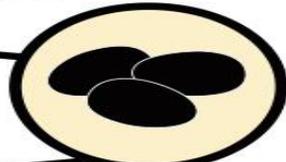
## 6. MILK & DAIRY PRODUCTS

A total of 55,000 head of dairy cows generated milk worth \$231 million in cash receipts in 2012. Nebraska is home to approximately 200 dairy farms, with most located in the central and eastern parts of the state.



## 7. HAY

Farmers generated \$211 million in cash receipts on 2.57 million harvested acres of hay in 2012. Alfalfa and grass hay are produced in every county in the state.



## 8. CHICKEN EGGS

Nebraska is home to 9.3 million chickens that lay about 2.7 billion eggs annually. This commodity generated \$180 million in cash receipts in 2012. The state ranks 12th in the nation for egg production.



## 9. DRY BEANS

In 2012, the dry beans sector brought in about \$111 million in cash receipts. Varieties grown in Nebraska include Great Northern, Pinto, Black, Light Red Kidney, Navy, Pink and Garbanzo.



## 10. SUGAR BEETS

Sugar beet producers generated \$105 million in cash receipts in 2012. In Nebraska, sugar beets are generally planted in April and harvested in October.

Source: USDA National Agricultural Statistic Service, Tennessee Field Office

## Key Nebraska Ag Facts

Nebraska agriculture has been described as expansive and diverse with an abundance of natural resources. The landscape varies from large pastures dotted with feeding cattle, to miles of rolling hills bursting with a wide variety of crops, and everything in-between.



While Nebraska has everything needed to support all types of agriculture, including abundant water, and ample amounts of cropland and pasture, many would say its most important asset is its people.

Farms and ranches in Nebraska have been handed down from generation to generation, and families still serve as the hub of the state's number one industry, agriculture. Known for a hard-work ethic and a strong set of values, these families continue to produce the highest quality food products that help feed the world.

All Nebraskans seem connected to agriculture in one way or another. If they didn't come from a farm background, they are probably related to someone who did. Or they could very well work in the industry in a supporting role. After all, one in four jobs in the state is agriculture-related. There is a wide span of agricultural jobs in Nebraska, including careers in the areas of insurance, equipment sales and repair, technology, irrigation, engineering and many more. Agri-business is vital to the state's economy and having a ready and willing workforce has helped those businesses thrive.

Nebraska also has the infrastructure needed to transport grain, livestock and all types of agricultural products to their intended destination. The railroads, semis, trucks and other vehicles have the necessary pathways to move from east to west and north to south throughout the state.

With monikers like Cornhuskers and The Beef State, it doesn't take long to figure out corn and cattle are two of the top commodities produced in Nebraska. The state has been among the leading producers in each category nationally for many years. The ready supply of corn as feed for cattle results in producing premium-quality meat products, which are sought by consumers throughout the world.<sup>1</sup>

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<sup>1</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

## Geography

From picturesque rolling hills, to fertile valleys, to expansive plains, to the awe-inspiring Sandhills, the geography of Nebraska is one of the most unique in the United States. The landscape changes dramatically, especially traveling from west to east. There is an elevation drop of 4,584 feet in the

430 mile distance from Panorama Point in the west, to the southeast corner of the state along the Kansas border. Nebraska also borders the magnificent Missouri River and is home to the unique Platte River ecosystem, as well as massive Lake McConaughy, which covers a surface area of 35,700 acres.



Nebraskans are fortunate to enjoy all four seasons: spring, summer, fall, and winter. While these seasonal changes can bring challenging weather at times, including thunderstorms and snowfall, it also opens up the door for diverse and sustainable agriculture. Meanwhile, Nebraska's climatic conditions vary greatly from one end of the state to the other due to a significant drop in elevation from west to east. For instance, in northwest Nebraska, where the elevation reaches over 3,400 feet above sea level, the humidity levels are relatively low, and the annual average rainfall is 18 inches. In the southeast corner of the state where elevation is only 840 feet above sea level, the average annual rainfall is much higher at over 30 inches.<sup>2</sup>

One of Nebraska's most vital natural resources is its massive supply of groundwater. The High Plains Aquifer, also commonly referred to as the Ogallala Aquifer, stretches through parts of eight states, but its most abundant water resource is located in nearly two-thirds of Nebraska. This groundwater availability has been essential to the success of agriculture in the state.

Center pivot irrigation is the most common method of providing water to row crops in the state. As a result, four of the largest manufacturers of center pivot systems in the world are located in Nebraska. An accessible water supply also is vital to Nebraska's livestock and dairy production.<sup>3</sup>

<sup>2</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

<sup>3</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

- Cash receipts from farm marketing contributed over \$21.5 billion to Nebraska's economy in 2016 and 6.0% of the U.S. total.
- Nebraska's ten leading commodities (in order of value) for 2016 cash receipts are cattle and calves, corn, soybeans, hogs, dairy products, wheat, hay, chicken eggs, dry beans, and sorghum.
- Every dollar in agricultural exports generates \$1.28 in economic activities such as transportation, financing, warehousing, and production. Nebraska's \$6.58 billion in agricultural exports in 2016 translate into \$8 billion in additional economic activity.
- Nebraska's top five agricultural exports in 2016 were soybeans, corn, beef and veal, feeds and fodders, and processed grain products.
- Nebraska had 47,400 farms and ranches during 2017; the average operation consisted of 954 acres (386 ha).
- In 2017, Nebraska ranked second in ethanol production capacity, with 25 operating plants having a production capacity of more than 2.1 billion gallons(2,177,175,000 gallons). Approximately 36% of the state's 2017 corn crop was utilized in ethanol production.
- Livestock or poultry operations were found on 49% of Nebraska farms.
- The top five counties ranked by agricultural sales from the 2012 Census were Cuming, Custer, Dawson, Lincoln, and Phelps.
- In 2015, Nebraska was 12th nationally in certified organic cropland acres (85,172) (21,267 ha.) and in 2011 eighth in certified organic pasture acres (53,174)(21,518 ha).
- 1 in 4 jobs in Nebraska are related to agriculture.
- The average age of a Nebraska principal operator was 55.7 in 2012.
- During the 5-year period between 2007 and 2012, Nebraska experienced a 5% increase in the number of farms and a 10% increase in the number of new farmers.
- From east to west, Nebraska experiences a 4,584-foot elevation difference, and the average annual precipitation decreases by one inch every 25 miles, allowing Nebraska to have a diverse agricultural industry from one side of the state to the other.

## Nebraska's Natural Resources

- Nebraska's farms and ranches utilize 45.2 million acres – 91% of the state's total land area.
- Nebraska is fortunate to have aquifers below it. If poured over the surface of the state, the water in those aquifers would have a depth of 37.9 feet (11.6 meters). The state has 96,547 registered, active irrigation wells supplying water to over 8.3 million acres of harvested cropland and pasture. Of the total cropland harvested during 2012, 44% was irrigated.

- Nearly 24,000 miles of rivers and streams add to Nebraska’s bountiful natural resources.
- There are nearly 23 million acres (9,307,806 ha) of rangeland and pastureland in Nebraska – half of which are in the Sandhills.

## Beans

While dry edible beans don't rank in the top five ag products raised in the state, Nebraska is the No. 1 nationwide producer of Great Northern beans, No. 2 producer of light-red kidney beans, No. 2 producer of pinto beans, and No. 4 overall producer of dry edible beans. In this respect, the importance of the industry is immense.<sup>4</sup>

In 2015, Nebraska farmers planted just over 16 million acres with various crops. When corn, soybeans, and wheat are removed, just over 2% is left for other crops. From this standpoint, the production of these crops could not make a large impact on the economic health of the state. However, given that low corn, soybean and gasoline prices have depressed the state's economy in recent years, it's important to consider multiple production opportunities. Dry edible bean production is one of these other enterprises that offer potential benefits for the state.

Dry edible beans are predominately grown in western Nebraska due to the arid climate in that region. The crop usually is grown under irrigation. When the plants have dried and are ready for harvest, the plants are cut close to the ground in the early morning while they’re covered with dew. The whole plant is allowed to dry in windrows before being combined. The combining process breaks the pods open and separates the dry edible beans from the plant material. After harvest, the beans are delivered to local processors where they are graded, cleaned and packaged for shipping to canners, grocery stores, and overseas markets.

Nebraska ranks 1st in the nation in Great Northern bean production, 2<sup>nd</sup> in the nation for pinto bean production and 3<sup>rd</sup> in the nation for all dry edible bean production.

- Several varieties are grown in Nebraska including Great Northern beans, pinto beans, black beans, light red kidney beans, navy beans, pink beans, and garbanzo beans.
- Nebraska annually harvests 125,000 acres of dry edible beans for a total production of more than 2.5 million hundred-weight bags. That is equal to approximately 1 billion servings of dry beans.<sup>5</sup>

<sup>4</sup> Meyer, T. (2018). Bean growers face tough market. Retrieved from <https://www.nebraskafarmer.com/crops/bean-growers-face-tough-market>

<sup>5</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

**On the Pulse of Nebraska**  
Nebraska is a top producer of pulses, a group of crops that includes field peas, dry beans, chickpeas and lentils.

**#1**  
Nebraska is No. 1 in the nation for the production of Great Northern beans.

**REASONS TO EAT PULSES**

1. Highly nutritious
2. Important health benefits
3. Add to climate change mitigation and adaptation
4. Promote biodiversity and sustainable agriculture
5. Promote economic accessibility and food security

**FIELD PEAS: A CROP TO WATCH**  
The field pea, or "dry pea," is a type of legume. Food trends, including plant-based and gluten-free diets, may help create a new demand for this highly nutritious food. The field pea is gaining popularity in Nebraska, which already has about 100,000 acres in production.

**100K**  
There are about 100,000 acres of field peas growing in Nebraska.

**NEBRASKA PRODUCES 11 PERCENT OF THE NATION'S DRY EDIBLE BEANS.**

Source: University of Nebraska - Lincoln

Source: <https://www.farmflavor.com/nebraska/nebraska-agriculture-2017/>

## Breeding Beans

On a recent warm, late-summer day, as many dry edible bean growers in Nebraska were watching their fields turn color and preparing for harvest, four scientists paced through a bean field north of Scottsbluff. This field, part of the research acreage at the University of Nebraska's Panhandle Research and Extension Center, consists of hundreds of tiny plots, each a different line or type of dry bean representing varieties from all over the world.

These plots are part of a collaborative effort among plant breeders from UNL, other land-grant universities, USDA and international organizations like the International Center for Tropical Agriculture (CIAT) to improve the genetics of dry edible beans grown worldwide.

Dry bean lines are being tested to see whether their genes might be introduced into bean lines sold to Nebraska farmers to make their crops more resistant to diseases like bacterial blight, to increase crop tolerance to heat and drought, or to produce plants with an upright architecture, suitable for direct harvest by combine. Other, ever-important traits are early maturation, yield, seed size, and seed quality.

Carlos Urrea, dry bean breeding specialist at the UNL Panhandle Research and Extension Center, oversees these plots.

On this day, Urrea and three USDA plant breeders from Washington state, Michigan and Puerto Rico were inspecting the plots, looking for plants with genetic material that could be introduced into ongoing breeding efforts at Nebraska and elsewhere.

Market classes in these plots include pinto, great northern, small blacks, reds, light-red kidney, yellows, cranberries, and an assortment of others (Calima, Rozi Koko, Kablanketi, etc.) from different continents.

The collaborative projects represented include the Western Regional Bean Trials (Nebraska, Colorado, Idaho and Washington); the Midwest Regional Performance Nursery (Nebraska, Michigan, North Dakota, Colorado and Wyoming); the Cooperative Dry Bean Nursery (nine U.S. states, one Canadian province); the shuttle bean breeding nursery with Puerto Rico; and a dry bean drought nursery and white mold monitoring nursery, each involving several states.

When the bean breeders tour cooperative plots like Urrea's at Scottsbluff, they look for plants that demonstrate a combination of traits, including moderate to early maturity, good pod set, good yield (more seeds in the pods), uniformity of maturity, and reduced disease, said Phil Miklas of USDA Agricultural Research Service in Prosser, Wash.

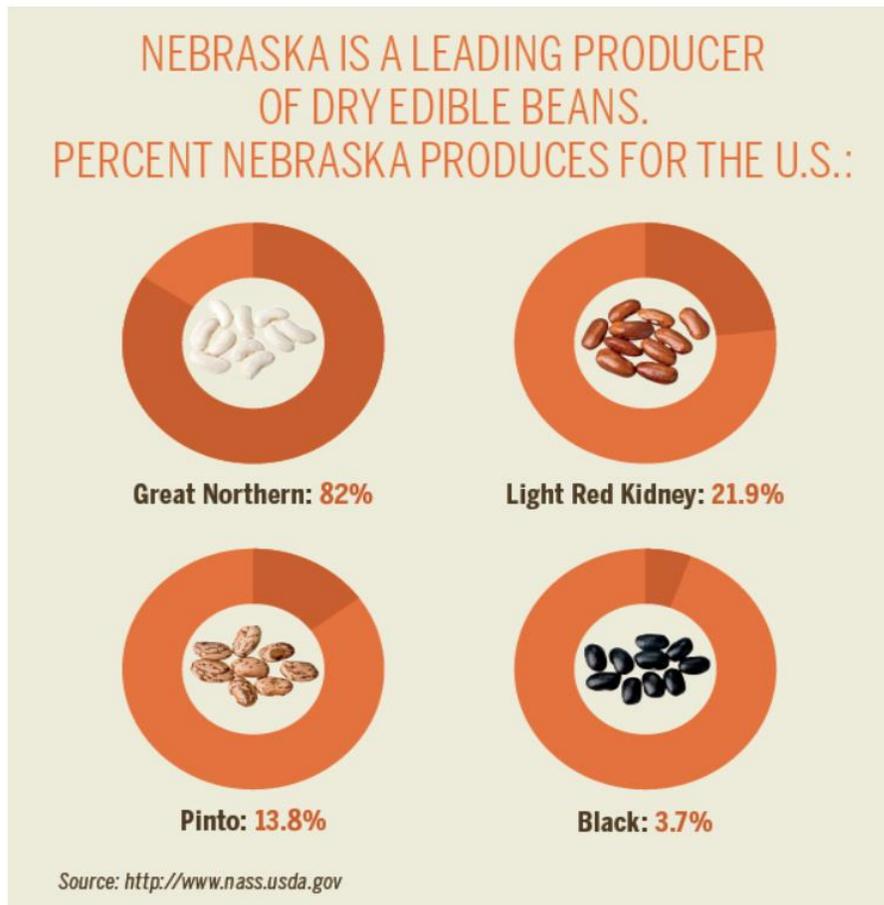
As the plot inspection proceeds, Miklas notes the beans in a particular plot are later in maturity and not adapted to this region.

"These materials actually were bred in Tanzania and selected in Tanzania," he said. "What we're looking for here are potential gems — materials that have been selected in a wildly, vastly different environment that might bring in some new genetic diversity into the large-seeded kidneys and cranberry beans that we grow in the U.S."

Miklas said each of the four who are touring the fields has projects in East Africa.

"As part of the research community, we share materials and work together and try to help each other succeed in developing better cultivars," he said. A USAID project designed to help feed people in Africa might also contribute genetic material that helps fight a plant disease in America, he said.

Tim Porch is a research geneticist with USDA-ARS in Mayaguez, Puerto Rico, who has worked



with Urrea on the shuttle breeding project for 11 years.

"We select at locations in Nebraska in the summertime and Puerto Rico in the winter time," Porch said. "We're pulling in other sources of drought tolerance from the South American and Central American germplasm. So, there are crosses between two races of these smaller seed beans. By doing that, we're expanding the

diversity of these seed classes and bringing in other sources of drought tolerance. Also, with climate change, we're bringing in heat tolerance as well. And we've been selecting for disease resistance for common bacterial blight at both locations."

The dry beans that researchers are seeing recently have a better plant architecture than 15 years ago, Urrea said. They are more upright, suitable for direct harvest by combine. Some of the beans carry multiple genes for resistance to more diseases than in the past. Over the years, the number of market classes represented in the plots has increased.<sup>6</sup>

The production of dry edible beans is mostly limited to the western reaches of the state, where the climate is better suited to the crop. Even though the growing conditions are ideal for production, the actual production process is far from straightforward. Dry edible bean producers face all of the normal challenges of crop production, along with several other layers of complexity.

<sup>6</sup> Ostdeik, D. (2018). Nebraska plays key role in global dry bean breeding efforts. Retrieved from <https://www.nebraskafarmer.com/crops/nebraska-plays-key-role-global-dry-bean-breeding-efforts>

Meanwhile, dry edible bean growers face market dynamics less standardized than other commodities. The result of these less-than-perfectly-competitive markets potentially increases the risk for dry edible bean producers.

One market structure not often evaluated in economics is oligopsony. Oligopoly, a direct parallel that is often studied, is a market where there are only a few sellers.

Oligopsony is the mirror image of oligopoly. Instead of having few sellers of a product, there are few buyers. The market power oligopolists hold is derived from their ability to force a lower price on producers in a similar way that oligopolists can influence the market price in an upward direction. Simply put, oligopolists aim to extract consumer surplus from buyers. Oligopsonists aim to extract producer surplus from sellers (profit).

The fact that there are only less than four main processors of dry edible beans that producers can sell to, however, isn't sufficient to raise concerns about market practices as they relate to producers, but several other nuances in the market exist.

For example, there is no standardized futures contract for dry edible bean production. If producers desire to hedge risk, the typical arrangement is that they may contract a forward price with one of the processors, but not for the entirety of the crop. In addition, the local market is not active, with cash price changes happening infrequently. In short, the price data available at any given time could best be described as incomplete.

Another way to view prices would be specifically local. The prices paid by processors seem to have more influence from substitutes in production (soybeans) than global demand and prices. Another key detail is that there are times when processors allow producers to contract their entire crop. If the processor is willing to accept all downside market risk, the global price (that they have contracted to receive) is surely bullish. In short, there could be speculation that processors are exercising their market power by eliminating the possibility for producers to share in the profits of higher global prices.

## **Driving demand**

Unlike animal protein products, there is little or no argument regarding the health benefits of dry edible beans. Dry edible beans are high in protein and fiber, all while being low in fat and calories.

While its true U.S. consumers continue to increase per capita consumption of animal protein, it is also true that demand for healthier alternatives has increased. Unfortunately, studies show that dry edible bean consumption is negatively correlated with income. In other words, dry beans are considered an inferior good.

When the health benefits of beans are compared to foods like quinoa, chia, nuts, pumpkins or lentils, they compare favorably. These foods are all often associated with the moniker of "superfood."

The price of beans at the retail level is low, and this reflects a lack of value-added beyond the processing level of the supply chain. For beans to be edible, useful and tasty, a significant amount of preparation is required. This value added is almost always the result of in-home production, which is both a benefit and curse. Because beans are sold in need of more value added, they are flexible in their use. Unfortunately, this low cost has firmly segmented beans as an inferior good — something you only buy if you have to.

However, the dry edible bean market is profitable for producers to continue to expand. When this is combined with the murky nature of the supply chain and the inferior nature of demand, the outlook for the industry is positive.

Part of the problem is exposure to market risk. This risk can be managed by holding cash reserves, spreading sales or utilizing derivative markets. None of these strategies address the long-run risk, however, of becoming very specialized in the production of only a few enterprises. Nebraska farmers and ranchers are resourceful, and diversifying production in enterprises such as dry edible beans will help guarantee a successful ag economy.<sup>7</sup>

## Beef Packing

Beef production is the largest sector of agriculture in Nebraska, and Nebraska is the only state that is a national leader in every aspect of beef production: cow/calf, backgrounding, corn growing, cattle feeding, and processing. Calves born on one of Nebraska's 19,000 cow/calf ranches typically spend the majority of their lives on grass before being sent to a feedlot for finishing. Cattle typically spend 3-6 months in the feedlot being fed a balanced ration of corn, forages, distillers' grains, and vitamin and mineral supplements. Corn feeding allows Nebraska producers to get greater marbling and tenderness in the final beef product. Corn-fed Nebraska beef is known worldwide for its flavor, tenderness, and quality.<sup>8</sup>

- Cattle outnumber people in Nebraska more than three to one.
- Every part of a cow is used for a wide variety of products, including leather, fishing line, biodegradable outboard motor oil, pet chew toys, and gummy candies.<sup>9</sup>

Lower heifer retention rates indicate growth may be slowing nationally.

In January, Nebraska started off the year with a higher beginning cattle inventory than the state has seen since the 1980s.<sup>10</sup>

<sup>7</sup> Meyer, T. (2018). Bean growers face tough market. Retrieved from <https://www.nebraskafarmer.com/crops/bean-growers-face-tough-market>

<sup>8</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

<sup>9</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

<sup>10</sup> Harris, T. (2018). Nebraska beef cattle numbers reach 30-year high. Retrieved from <https://www.nebraskafarmer.com/beef/nebraska-beef-cattle-numbers-reach-30-year-high>

All cattle and calves in Nebraska as of Jan. 1 totaled 6.8 million head — a 5% increase from last year, according to USDA's National Agricultural Statistics Service. The last time the inventory was that high at the start of the year was in 1984 when numbers reached 6.9 million.

However, the highest number for Jan. 1 was in 1974, with 7.4 million head, according to NASS data. It was around that time that overall cattle numbers reached an all-time high nationally.

Last week, Nebraska Gov. Pete Ricketts issued a statement following the report.

"Congratulations to Nebraska's cattle producers on achieving the distinction of the most cattle on feed of any state," he said. "Consistent focus on opening new markets, like China, and telling the story of Nebraska beef through international promotion efforts are supporting growth in the industry. We look forward to continued partnership with industry leaders to help create more opportunities to grow our state's number one industry and the Beef State."

It comes as no surprise that Nebraska, known for having the highest number of cattle on feed, saw the biggest increase from cattle on feed — up 12% from last year for a total of 2.77 million. In addition, Pete McClymont, Nebraska Cattlemen executive vice president, says Nebraska has always maintained a strong cow-calf herd. With 1.9 million beef cows, Nebraska ranks fourth nationally behind Texas, Oklahoma, and Missouri for beef cow numbers.

"One of the reasons Nebraska has come back to this position is due to our resources," McClymont says. "If you look at Nebraska's resources, you think of abundant grass, water resources, the crops needed to feed our cattle. And most of all, we're really blessed with great producers that are committed to doing the right thing for the animals, the land, the resources. You add all that up, and we have everything needed to be the premier beef state."

While total cattle numbers also increased nationally, to 94.4 million head — a 1% increase over January 2017 numbers — Jeff Stolle, vice president of marketing at Nebraska Cattlemen, says the increase may be slowing on a national level.

"On the inventory report that came out the middle of the last week, the indication was beef replacement heifers were down 4% from the first of January 2017," Stolle says. "We're not seeing as aggressive expansion over the last year or so compared to the previous two to three years, according to USDA data."

And, Stolle adds, overall red meat supply will likely continue to increase moving forward. The challenge is to build demand domestically and internationally to use the additional supply at price levels that will maintain profitability.

## **International Issues**

USA CEO Bill Bullard said while his organization supported President Trump's plan to renegotiate NAFTA, the new agreement doesn't help the interest of America's independent cattle farmers and ranchers.

Bullard said the new U.S.-Mexico-Canada Agreement (USMCA) includes several important improvements. But he said R-CALF USA is disappointed that the Trump administration, like previous administrations, “folded under the pressure of the multinational meatpackers and their allies who successfully sought to make no changes to NAFTA that would help the largest segment of American agriculture — the U.S. cattle industry — overcome the abusive market power of foreign and domestic multinational meatpackers.”

Bullard said multinational meatpackers “will continue to leverage-down the price and value of U.S. cattle under the new agreement.”

He said the agreement does not allow the U.S. to reinstate country-of-origin labeling (COOL) requirements for beef. That means that multinational packers can continue sourcing cheaper cattle and beef from Canada and Mexico and sell that beef to unsuspecting American consumers as a product of the United States.

“The lack of COOL has and will continue to allow multinational meatpackers to continually displace domestic production with undifferentiated imports,” Bullard said.

He said the agreement contains the same rules of origin for cattle and beef as contained in the original NAFTA, as well as in the failed TPP agreement.

“Those rules allow Mexico to import live cattle from South America, slaughter them in Mexico, and then export the resulting beef duty-free to the U.S. where it can be mislabeled as a product of the United States,” Bullard said. “Even consumers abroad can receive USA labeled beef that is actually sourced from foreign cattle.”

He also said the new agreement lacks safeguards to protect the value of domestic cattle from import surges, like the 41 percent increase in the value of beef and cattle imported from Canada and Mexico that occurred in 2014-15, which he said increased price-depressing cold storage volumes and contributed to the 2015 price collapse that worsened after the repeal of COOL.

“Every time our industry’s price-point is sufficient to signal an opportunity to strengthen and grow our industry, unlimited imports of cheaper cattle and undifferentiated beef enter the U.S. market and drive that price-point downward, thus eliminating opportunities for U.S. farmers and ranchers,” Bullard said.

Since NAFTA, he added, the U.S. has imported on average over 2 million tariff-free Mexican and Canadian cattle each year.

“If we negotiated a trade agreement that allowed us to produce those cattle in America, our industry could support well over 6,000 new ranches, each with a 300-head herd size,” Bullard said. “Instead, our trade agreements continue to encourage both Canada and Mexico to overproduce.”

He said the U.S. domestic live cattle supply chain has decreased by 6.5 million domestic cattle since NAFTA and USMCA will “worsen our industry’s downward trend.”<sup>11</sup>

An official with the Omaha beef production plant, which became the first American packer to ship beef to China when that market reopened last summer, says sales to the country are going well.

Jerry Wiggs is the senior director of export sales and marketing for Greater Omaha Packing Company.

“Like any new market, it has its challenges,” Wiggs said. “However, if I do a comparison of where I was in the first eight months of, say, shipping to Europe, compared to where we are eight months into shipping beef to China, we are probably a 1,000% more...shipping into China than what we were into the European Union.”

According to Wiggs, there’s great potential for U.S. beef in China because of its growing middle-class population.

“I’ve been to China now three times in the last six months, and it is amazing the growth that is going (on) over there,” Wiggs said.

Mexico is one of Greater Omaha Packing’s biggest customers. Wiggs claims the disputes over NAFTA and the border wall, so far, have not hurt their business with Mexico.

One of the company’s fastest growing markets for beef, according to Wiggs, is the Middle East – especially Saudi Arabia.

“The beef into Saudi Arabia – it’s been legal to ship there for a while, but they put up some regulations that a lot of the packers...aren’t willing to jump through some of these hoops,” Wiggs said. “A lot of times we’re willing to do what, say, a major beef packer may not be willing to do.”

## **Beef Business is Getting Greater**

The Greater Omaha Packing Company processes around 2,300 head of cattle per day and employs over 1,000 people. The company ships beef to all 50 states and 70 countries around the world.<sup>12</sup>

Greater Omaha Packing has also been making changes to its new cold storage building that doesn’t rise quite as high as the neighboring 10-story, 1920s-era Livestock Exchange Building.

<sup>11</sup> R-CALF: Trump missed chance to help cattle industry in new USMCA. (2018). Retrieved from [https://www. Kearneyhub.com/news/agriculture/latest/r-calf-trump-missed-chance-to-help-cattle-industry-in/article\\_021d3c94-6f89-5771-a1f7-46673477e9b1.html](https://www. Kearneyhub.com/news/agriculture/latest/r-calf-trump-missed-chance-to-help-cattle-industry-in/article_021d3c94-6f89-5771-a1f7-46673477e9b1.html)

<sup>12</sup> Kelley, M. (2017). Nebraska beef packer sees booming business in China. Retrieved from [http://norfolkdailynews.com/wjag/news/nebraska-beef-packer-sees-booming-business-in-china/article\\_fdf8a648-2957-11e8-bbfa-933f081b84f5.html](http://norfolkdailynews.com/wjag/news/nebraska-beef-packer-sees-booming-business-in-china/article_fdf8a648-2957-11e8-bbfa-933f081b84f5.html)

But at 86 feet tall (about eight stories), the new building is a sign that the neighborhood is still a busy hub of beef slaughter — and a lot more high-tech than in those old days.

The new building will house a system of robotics and conveyors, controlled by software, to sort and store as many as 65,000 boxes of refrigerated beef cuts.

The \$37 million investment will help Greater Omaha Packing be more efficient, said Henry Davis, president of the company.

The software will track which of the company's 5,000 edible products is in each box, what it weighs and when it was packed, and it will make decisions about which box to ship at which time to maximize profit, Davis said.

It's the next step in how Greater Omaha has shifted its business over the decades to do more processing in-house.

Decades ago, plants such as Greater Omaha's produced large sides and quarters of beef that weren't sliced up until they arrived at the supermarket, restaurant or distributor. Today, more customers want beef cuts that are individually portioned for the home cook or restaurant chef. That means a lot more, and smaller, boxes of beef to store and track right at the plant.

"The smaller the package that we make, the more value it is to our customers and the more profit it is for us," Davis said.

Greater Omaha, with \$1.7 billion in revenue, says it is the fifth-largest U.S. beef packer, behind only the "Big Four": Tyson, Cargill, JBS, and National Beef.

The plant specializes in high-quality beef and ships to 70 countries, meeting the specialized import requirements of destinations including China and the European Union.

The new addition will free up space elsewhere in the plant for the company to grow other product lines.

Production of "value-added" cuts will triple to about 300,000 pounds a week. Those are higher-end cuts individually sealed in special packaging that allows for longer shelf life and more international distribution.

And production of ground beef will nearly double, to about 1.1 million pounds a week.

The project also will free up 59 workers to be reassigned to other jobs — important at a time when livestock processing labor is hard to come by, because of low unemployment, industry growth and a chill in immigration.

Greater Omaha's move fits in with a larger trend toward robotics in agriculture, seen in farm fields, dairy milking parlors, and food logistics systems.

“As agriculture enters the era of farm labor scarcity, many agricultural producers are looking to smart technologies and robotics to help adapt their businesses to be more labor-efficient,” said David Slaughter, professor of biological and agricultural engineering at the University of California, Davis.

Accurately breaking down a beef carcass is still too precise a job to be turned over to robots, because of the variance in size among large livestock, Davis said.

But other tasks can be mechanized. Meanwhile, Greater Omaha will hire 10 to 12 technicians to operate the new cold storage system and software. The plant employs about 1,150 people total.

Another benefit is an improvement in food safety, Davis said. The more beef can be handled in his controlled facility, and not reopened or processed elsewhere before it reaches the consumer, the less chance there is for temperature variation or contamination, he said. “Once we seal it, it’s sealed.”

The project is expected to be complete this summer.<sup>13</sup>

## China’s Challenging Costs

Agribusiness Cargill is working with cattle suppliers and with buyers in Asia to determine how it could meet the needs of Chinese customers and China’s restrictions.

“Based on our knowledge of the agreement, as well as our knowledge of the U.S. beef supply chain, only a small percentage of the total U.S. cattle supply will be eligible for beef products that are exported to China,” said Mike Martin, a spokesman for the Minnesota company. Cargill processes 5,000 head of cattle daily at a plant in Schuyler, Nebraska, sourced from the surrounding area.

China is expected to have tighter rules than some of the United States’ other trade partners.

The extra costs of raising beef to China’s expected specifications might add up to \$150 per animal, estimated John Butler, chief executive officer of Beef Marketing Group, a Manhattan, Kansas, company that operates six feedlots in Nebraska and 12 in Kansas, with a total of about 325,000 cattle.

That’s sometimes more than his company’s profit on animals raised for U.S. consumption, so depending on the price he could fetch raising beef for China, the extra cost might force him to stay on the sidelines, Butler said.

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<sup>13</sup> South Omaha beef plant getting bigger, smarter with \$37 million cold storage. (2018). Retrieved from [https://www.omaha.com/money/south-omaha-beef-plant-getting-bigger-smarter-with-million-cold/article\\_fd5ca217-52a9-564e-acf7-bff0e18c2daa.html](https://www.omaha.com/money/south-omaha-beef-plant-getting-bigger-smarter-with-million-cold/article_fd5ca217-52a9-564e-acf7-bff0e18c2daa.html)

The costs would come in part from the expense of a traceability system, so buyers could track individual cattle to their place of birth. That's one of the demands China is likely to place on imports, according to news reports, analysts and industry leaders.

There are also extra costs in raising cattle without two types of growth promoters commonly use in the United States: hormone implants and non-hormonal feed additives called beta-agonists. China will likely test beef for residue of those. While their use wouldn't be explicitly banned, beef would have to be free of any traces. Butler said for his business it wouldn't be worth the risk of a positive test, which could shut down shipments.

Whether or not Beef Marketing Group participates, Butler said he expects U.S. beef exports to China — closed off since 2003 after a single case of mad cow disease — to be a boost to his industry as a whole. Additional demand is welcome during a period of expansion for the industry, he said.

Broken Bow feedlot company Adams Land & Cattle, with capacity for 120,000 cattle, isn't currently feeding any cattle specifically for the Chinese market and isn't taking any steps to arrange contracts to sell beef destined for China, because of the uncertainty so far about China's restrictions.

"The trade restrictions are going to be a challenge," Adams President Abram Babcock said. He, too, said opening a new market is a positive step for the industry. But the nature of the U.S. beef system today — where ranchers, not meatpackers, own a calf at its birth — will make it difficult to trace cattle the way China wants.

Some cattle feeders said it wouldn't be a problem to meet China's requirements. Swanson, the skeptical cattle producer and bull seller in Oxford, said he's willing to document his cattle's origins.

"Record keeping has been a huge part of what we do every day," he said.

In Wisner, Nebraska, cattle feeder Jordan Feller said the same: "It's not a problem at all, really."

It's true that it's easy enough, and the technology is available, agreed Butler, with Beef Marketing Group, but the question remains: "Is China going to be willing to pay a premium" to cover the costs?

Sam Hake, a farmer who raises cattle near Madison, Nebraska, described himself as optimistic but leery.

He's optimistic that he might be able to command premium prices for his cattle if he raises them to this new customer's specs. Now when he sells his cattle at a Yankton, South Dakota, livestock market, there is little to set his cattle apart from any other that end up at a big U.S. meatpacker's slaughterhouse.

"I would like to find a way to differentiate myself so I become more profitable," he said.

On the other hand, Hake is leery of the industry being captive to the regulations China will impose under the trade deal. What if China again were to shut down imports of U.S. beef like it did in 2003?

“Imagine what that would do to our beef price,” he said.

Meatpackers also aren’t eager to see new restrictions on their industry.

James Timmerman, chief financial officer for Nebraska Beef in Omaha, said restrictions on tracing cattle to the ranch of origin would be a “stumbling block.” His plant doesn’t currently export to countries that require traceability back to the farm or ranch where the animal was born.

More beef producers have voluntarily enrolled in “source-verified” inspection programs in recent years, hoping to command a premium as consumers look to know more about their food. But some in the industry see this as an unnecessary intrusion.

Greater Omaha Packing exports to 58 countries, including those with traceability requirements. But plant officials said extra restrictions from China are unnecessary because beef inspected by the U.S. Department of Agriculture is safe.

Tyson Foods, the nation’s biggest beef processor with slaughterhouses in Lexington and Dakota City, Nebraska, said it’s “encouraged” by the trade agreement with China but still is awaiting details before commenting about how it will participate.

Another reason analysts aren’t sure about the size of the opportunity ahead: It’s unclear how Chinese consumers will respond to American beef.

Most beef imported into China is grass-fed or a cheap “commodity” quality beef, with a different taste and texture from the primarily grain-fattened American cattle, said Don Close, animal protein analyst at Rabobank.

“To immediately assume that there will be this massive demand for high-quality fed beef? That’s the unknown,” he said.

It could take time for Chinese consumers to develop a taste for the new product, he said. Many may not be able to afford it. Unlike in the U.S., grass-fed beef is cheaper in China than grain-fed.

And Chinese home cooks are unfamiliar with how to prepare beef — most is served at restaurants, and there will be a learning curve for consumers, Close said. U.S. packers also will need to prepare to sell to a market where the fastest-growing channel for selling meat products is e-commerce through online giant Alibaba.

“When you’re working with a population base of 1.4 billion people, is the potential there for it to be a major significant impact on the U.S. market? Absolutely true,” Close said. “I just don’t think it’s going to be a game changer on day one.”<sup>14</sup>

## Cold Storage Surplus

Beef supplies in cold storage were 8% higher on June 30, 2018, compared to the same period last year. [USDA’s monthly cold storage report](#), released Monday, July 23, estimated 448.6 million pounds of beef in cold storage, 33.2 million pounds more than last year.

Total red meat supplies in freezers were up 5% over last year, and total frozen poultry supplies were 6% higher than last year. Overall, the total cold storage of red meat and poultry exceeded 2.5 billion pounds.

Growing surpluses of red meat and poultry in cold storage raises anxiety for the U.S. meat industry that increasingly depends on exports. Such concern has increased as Mexico and China – among the largest buyers of U.S. meat – have imposed tariffs on U.S. pork in response to U.S. tariffs on steel, aluminum, and other goods.

Any reduction in U.S. beef, pork and poultry exports would come at a time when production of all red meat and poultry is on the rise. Americans are expected to consume 222 pounds of red meat and poultry on average in 2018, the largest total in more than a decade. A reduction in exports would put even more red meat and poultry on the U.S. market, pushing prices lower on all products.

[The Wall Street Journal reported](#) the U.S. meat industry’s specialized warehouses built to store meat and other goods are reaching capacity.

“We are packed full,” Joe Rumsey, president of Arkansas-based Zero Mountain Inc., told The Journal. The company’s five storage facilities serve as way stations for turkeys and chicken strips between processors and retailers, holding around 250 million pounds of products on any given day.

U.S. Ag Secretary Sonny Purdue has said the Trump administration recognizes the financial hardship livestock producers could face as a result of retaliatory tariffs, but farm country will be better off under new trade deals the administration is pursuing.

USDA said total frozen poultry supplies on June 30, 2018 were up 3 percent from the previous month and up 6 percent from a year ago. Total stocks of chicken were up 2 percent from the previous month and up 10 percent from last year. Total pounds of turkey in freezers were up 5 percent from last month but down 1 percent from June 30, 2017.

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<sup>14</sup> Solderlin, B. (2017). As Beef Industry sets signs on China, Nebraskans remain 'optimistic, yet somewhat guarded'. Retrieved from [https://www.omaha.com/money/as-beef-industry-sets-sights-on-china-nebraskans-remain-optimistic/article\\_3c5dd9ac-8878-5342-8af6-b24bfb6d75be.html](https://www.omaha.com/money/as-beef-industry-sets-sights-on-china-nebraskans-remain-optimistic/article_3c5dd9ac-8878-5342-8af6-b24bfb6d75be.html)

Total red meat supplies in freezers were down 7 percent from the previous month but up 5 percent from last year. Frozen pork supplies were down 10 percent from the previous month but up slightly from last year. Stocks of pork bellies were down 16 percent from last month but up 130 percent from last year.<sup>15</sup>

The Top 100, available in Meat & Poultry's print and online editions in 2013, found 31 companies with more than \$1 billion worth of sales, and it took almost \$200 million to be listed among the industry's top companies.

Here's a brief summary of just the top 10 biggest companies from the magazine's annual rankings, along with their locations in Nebraska:

- \* 1. Tyson Foods, Inc.: \$33.30 billion, 115,000 employees, 84 plants, Dakota City, Madison, Columbus, Lexington, Omaha.
- \* 2. JBS USA: \$31.30 billion, 61,659 employees, 47 plants, Grand Island and Omaha.
- \* 3. Cargill Meat Solutions: \$18 billion, 35,000 employees, 33 plants, Nebraska City, Schuyler, Columbus.
- \* 4. Smithfield Foods Inc.: \$13.09 billion, 46,050 employees, 40 plants, Lincoln, Omaha, Crete.
- \* 5. Sysco Corp.: \$11.8 billion, NA, operates in Lincoln.
- \* 6. ConAgra Foods Inc.: \$8.2 billion, employee and plant counts not available, based in Omaha. (Based on sales, 6 and 7 are tied)
- \* 7. Hormel Foods Corp.: \$8.2 billion, 19,700 employees, 42 plants, Fremont.
- \* 8. National Beef Packing Co. LLC: \$6.80 billion, 9000 employees, 6 plants, owned in part by Nebraska farmers and ranchers.
- \* 9. Keystone Foods, LLC: \$6.3 billion, 7,075 employees, 13 plants.
- \* 10. OSI Group: \$5.9 billion, 19,400 employees, 46 plants.<sup>16</sup>

Nebraska topped all other U.S. states for beef exports in 2017 for a second year in a row, its governor said in February 2018 in a statement that cited the state's abundance of feed grain, packing capacity and cattle feeding operations.

Last year Nebraska exported \$1.26 billion worth of beef, according to the U.S. Department of Agriculture's Global Agricultural Trade System (GATS).

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<sup>15</sup> Henderson, G. (2018). Industry Anxious Over Trade as Meat Surpluses Grow. Retrieved from <https://www.agweb.com/article/industry-anxious-over-trade-as-meat-surpluses-grow/>

<sup>16</sup> Biggest meat companies in Nebraska. (2013). Retrieved from [https://journalstar.com/business/local/biggest-meat-companies-in-nebraska-beef-products-inc-business-plunged/article\\_2a55a917-c7d3-5d4b-bacb-39cbab03d66e.html](https://journalstar.com/business/local/biggest-meat-companies-in-nebraska-beef-products-inc-business-plunged/article_2a55a917-c7d3-5d4b-bacb-39cbab03d66e.html)

It showed Nebraska's pork export markets took in \$479 million worth of product in 2017, a 20 percent increase from the previous year to become the fifth largest U.S. pork exporting state.

"This impressive growth in Nebraska's beef and pork exports shows how effective international trade is to growing our state," said Nebraska Governor Pete Ricketts.

Jim Robb, director of the Colorado-based Livestock Marketing Information Center, in part, attributed Nebraska's top beef export ranking to it being the home of some of the nation's largest packing plants. It is also in the western Corn Belt and feedlots are located throughout the state, Robb added.

With respect to hog farms, USDA's most recent quarterly hog report listed Nebraska as the fifth largest hog producing state, well behind industry leader Iowa where the hog population is highest.

Robb said these data underscore how crucial the ongoing North American Free Trade Agreement discussions are for the major agricultural states.<sup>17</sup>

## **Meatless Meat & Plant-Based Proteins?**

Nebraskans know where their meat comes from: the farms, ranches, feedlots and packing plants that make the state the nation's top beef producer and a growing supplier of pork and poultry.

But what happens to the Beef State's massive livestock industry if Americans switch to "meat" made from plant protein — or from muscle tissue grown not on farms but in big industrial tanks?

It might sound far-fetched, but the plant products have launched, and the factory-grown meat may be about to, with *lk* claims they are better for the environment than meat from livestock, and taste just as good.

Will they take off? No way, a steak-lover might say. But proponents point to the dairy aisle: Dairy milk sales are falling as shoppers pick up soy, almond, pea protein and other "milk" in mainstream supermarkets.

A future where lab-grown and plant-based "meat" is also mainstream may not be that far off. Expect to hear a lot about alternative meats in 2018: The industry is at a turning point thanks to investment from big names like Bill Gates, and big food companies like Tyson and Cargill.

"Technology will begin to disrupt the traditional food chain in 2018 as enterprising manufacturers aim to replace farms and factories with laboratories," market research company Mintel said in its recent annual food and drink trends report.

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<sup>17</sup> Nebraska repeats as top U.S. beef exporter in 2017. (2018). Retrieved from <https://www.reuters.com/article/us-usa-nebraska-beef/nebraska-repeats-as-top-u-s-beef-exporter-in-2017-idUSKCN1FX2TR>

Plant-based versions of familiar foods such as burgers and chicken strips are already available at some Midwestern supermarkets and restaurants. Food scientists process plant proteins to imitate real meat in ways that the smashed-bean veggie burgers of the '90s never did.

Not on the market yet, but possibly launching later this year, is a product sometimes called lab-grown meat or “clean meat.” It starts with real livestock cells and grows in a factory in a tank some call a fermenter or a bioreactor, where cells are fed nutrients and proliferate. The product looks sort of like ground meat — the technology isn't there yet to get cells to build a muscle structure that resembles a steak or chicken breast.

Leaders in Nebraska's beef industry are aware of the challengers but say their product is better.

“We'll see what the marketplace says, but we feel good about the growth of beef and the consumer's confidence in our product,” said Pete McClymont, Nebraska Cattlemen executive vice president.

The new products are launching at a time of rising meat consumption, including beef. Americans are expected to consume a record amount of meat this year — 222 pounds of red meat and poultry per person, the U.S. Department of Agriculture forecasts. McClymont said cattle producers are wondering why companies such as Tyson and Cargill are investing in what producers see as meat competitors.

The Nebraska Beef Council, which uses money raised from cattle sales to promote beef, won't be advocating for “lab-grown beef.”

“Our focus truly is letting the consumer know what a nutrient-dense food beef really is,” said Ann Marie Bosshamer, executive director of the Nebraska Beef Council.

As confident as beef producers are in their own product, advocates for these new alternatives contend the products will upend the U.S. livestock industry. They hope so, at least, arguing that livestock production is hard on the environment and unsustainable as the world's population grows.

“This is a new type of meat that can really change the world,” said Nick Halla, chief strategy officer for Impossible Foods.

The company makes the Impossible Burger, a patty sold in restaurants that looks and cooks much like a beef hamburger. Impossible credits its “heme” soy protein ingredient for its meaty taste and red color.

The company opened a new manufacturing plant in Oakland, California, last fall, making more than 1 million pounds of its burger mixture a month. (U.S. packers produce more than 2 billion pounds of beef a month.)

Its main competitor is Beyond Meat's Beyond Burger, sold in supermarkets in raw patties destined for the backyard grill.

Beyond Meat investor Tyson Foods — a major employer in Nebraska, with plants in Omaha, Lexington, Dakota City, and Madison — said plant protein burgers fit in with the company’s portfolio of protein-centric products and will help Tyson meet growing global demand for protein.

“This investment is about ‘and,’ not ‘or,’” spokeswoman Caroline Ahn said when asked whether Tyson foresees any drop-in livestock-based protein sales.

On the lab-grown meat side, companies including Hampton Creek and Memphis Meats are racing to commercialize their versions, said Paul Shapiro, a former vice president at the Humane Society of the United States and the author of a new book, “Clean Meat,” that chronicles these businesses and their investors.

Hampton Creek says its product will be sold in restaurants later this year. Memphis Meats says it will be a few years. Cost is a barrier.

“These are not alternatives to meat, they are actual animal meats, simply grown with fewer resources than we use to produce animal meats today,” Shapiro said.

Its backers liken it to “clean energy.”

They say the beef industry damages the environment with greenhouse gases produced by the livestock and in transportation and hurts water quality with runoff from farms growing grain for livestock feed.

For its part, the beef industry touts its gains in efficiency as cutting beef’s environmental footprint. Processors are under public pressure to conserve resources.

Steers and heifers headed to the slaughterhouse are a lot meatier than they used to be. In 2016 the U.S. produced 26 billion pounds of beef, nearly the same amount it did 40 years ago. It did so while raising and slaughtering 28 percent fewer cattle.

“What sustainability is is what producers are doing right now,” said Sara Place, an animal biologist who leads research in sustainable beef production for the National Cattlemen’s Beef Association.

Shapiro, the former Humane Society executive, says traditional producers should be worried about the factory-grown product, even though it’s yet to hit the market. He contends it will be so disruptive it will send the livestock industry the way of the horse-drawn carriage, whale oil lamps and ice blocks cut from lakes.

“There’s a reason Cargill is investing in this — it recognizes that the future of protein production doesn’t have to come out of live animals,” Shapiro said. The Minnesota-based agribusiness, with meat processing plants in Nebraska, is an investor in Memphis Meats.

Of course, it remains to be seen whether consumers will want to eat meat from a tank. And Cargill says it is still investing plenty in its livestock-based protein business, noting \$850 million spent in the past two years on acquisitions, plant expansions, and renovations, and new facilities.

“We believe consumers will continue to crave meat, and our goal is to bring it to the table in a safe, responsible and sustainable way,” said Sonya Roberts, president of growth ventures for Cargill Protein. “Cultured protein products will provide greater choice and help meet the needs of those consumers who seek options.”

Hampton Creek CEO Josh Tetrick said he’s not sure what path lab-grown meat will take, or if it will displace current sales of meat from livestock.

It could turn people who shun meat into meat eaters. It could also help satisfy the growing global demand for meat.

He said he’s in conversations with large meatpackers worldwide about working together: The meatpacker could license his technology, make the meat in its facility, and sell it using existing manufacturing and distribution channels.

He’s been surprised at the interest from meat processors.

“They approach the world through this question of ‘How do we sell more animal protein more efficiently, in a safer way, in a more sustainable way?’” he said. “They know it’s a challenge. They’re aware of the resource constraints around land and water.”

The plant-based protein makers also envision their products being sold far and wide, not appealing just to people who don’t eat meat today.

“We’re not going to have the big impact until we really hit the masses,” Impossible’s Halla said. That means plant-based meat in McDonald’s, Taco Bell and Subway, he said.

Consumers are increasingly interested in protein in all forms, and it’s showing up on labels in foods around the grocery store, even the cereal aisle.

Meat no longer has the only claim on protein in a shopper’s mind, said Danette Amstein, principal at Midan Marketing, a Chicago company whose clients include meat companies. “We have to share it with a long list of items, including fake meat,” which is what she calls plant-based patties.

Her advice to the meat industry is to keep an eye on the trend. The new competitors have the potential to erode market share.

“Don’t ignore it but consider how they can find more ways to talk about the nutritional value of meat,” or launch new protein-centric products, she advised.

Plant-based meat substitutes are one of the top challenges for agriculture in 2018, said Chuck Jolley, who is president of the Meat Industry Hall of Fame, and president of Jolley & Associates, another food industry marketing company.

“If Tyson decides that they want to make a big deal out of it, they have an awful lot of clout at the supermarket,” he said.

How fast could plant-based and lab-grown meats build market share?

It depends on how consumers perceive the new alternatives, including how they feel about the manufacturing process and whether they see a health benefit, analysts said.

It also depends on taste and cost. Some will switch because of the perceived environmental benefits, but most people won’t switch from traditional meat if the alternative is expensive or doesn’t taste good.

Advocates for lab-grown meat point to the milk aisle to illustrate how quickly new products can put a squeeze on conventional ones.

Cow’s milk has been losing shelf space and sales to competitors like soy milk, almond milk, and newer pea-protein milks.

Sales of dairy milk will continue to fall, market research company Mintel said. Mintel forecasts dairy milk sales to fall 11 percent between 2015 and 2020, to \$15.9 billion. Meanwhile, U.S. sales of non-dairy milk will grow by about 50 percent, to \$3 billion.

Dairy farmers try to defend their territory in the milk aisle. They, with members of Congress, have launched a campaign against the use of the word “milk” on non-dairy beverages. The meat industry could put up that kind of fight over “clean meat” and “plant-based meat.”

Ironically, total U.S. milk production has been growing. Americans are passing on milk but eating more yogurt, butter, and cheese. Similarly, if consumers replace burgers with plant matter, they still may order up real-beef steaks.

If the new products do take a bite out of meat sales, Nebraska could be vulnerable, its economy relying on a livestock industry that employs tens of thousands of people in a labor force of 1 million.

Still, don’t sell your herd just yet. A pair of recent reports, from ag lenders CoBank and Rabobank, conclude that the new meat alternatives aren’t going to make a significant dent in demand for meat, at least not anytime soon.

Yes, meat alternatives are growing quickly, CoBank economist Trevor Amen wrote in a November report, and are something to watch. But they’ll remain “dwarfed” by sales of traditional meat. The alternatives may benefit from total global protein demand growth but won’t bite into the existing market for livestock and poultry protein, he said.

Rabobank said, “alternative protein products are not about to get close to the demand for traditional meat products,” although it said growth of these products will be faster in Europe and in some coastal, urban areas of the U.S., and will represent a material share of growth there.

Meat processors can respond by promoting the health benefits of eating animal protein and improving animal welfare and the sustainability of their supply chains and operations, some analysts say.

If the new products cut into beef sales, they could also open new opportunities for Nebraska agriculture. Some plant-based proteins come from crops like peas, some of which are grown here. Tetrick at Hampton Creek said it makes sense to put manufacturing facilities in the Midwest, taking advantage of livestock processors’ supply chains and technical capabilities. Beyond Meat already has a plant in Columbia, Missouri.

Whatever “meat” consumers eat, it seems the Midwest will have a role.<sup>18</sup>

## Meat Packer Jobs

On any given Monday, America’s biggest supplier of ground beef has 1,000 jobs unfilled, pushing Cargill Inc. to aggressively sweeten the pot on benefits to retain existing workers and hire new ones.

The openings, largely at the meatpacker level, are the result of the Trump administration’s tough stand on immigration and a U.S. unemployment rate reaching decade lows. While the number represents less than 1% of Cargill’s work force, the shortage is slowing output and hindering production of new higher-margin products, executives say.

With global demand for meat rising in a robust economy, Cargill and other industry leaders say the need to expand gives them little choice but to boost worker benefits -- with added pay in some cases, as well as new housing, health care, and busing incentives.

Companies are adding plants, but “whether or not they can run those plants efficiently is kind of a jump ball,” Christine McCracken, New York-based analyst for Rabobank International, said by telephone. “What we’re seeing today doesn’t indicate that they’ll be able to fully ramp up production.”

“Recruiting and retaining qualified workers in the meat and poultry processing industries was always difficult,” wrote in a note in July. “But it is now a perpetual grind.”

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<sup>18</sup> Solderlin, B. (2018). Meat Alternatives May Threaten Livestock Industry. Retrieved from [https://www.omaha.com/money/meat-alternatives-may-threaten-livestock-industry-but-cattlemen-say-nothing/article\\_c8a682f1-99a6-572c-8f44-b171305913c3.html](https://www.omaha.com/money/meat-alternatives-may-threaten-livestock-industry-but-cattlemen-say-nothing/article_c8a682f1-99a6-572c-8f44-b171305913c3.html)

In its August earnings call, Pilgrim's Pride Corp., the second-largest U.S. chicken company, said it expects tight labor conditions "will govern the pace of industry capacity additions in the near to mid-term."

Meat processing is tough work, with frigid temperatures, sharp equipment, bloody meat, fast-moving conveyor belts, and hours on your feet. In the past, the plants have offered go-to-jobs for new immigrants, but with immigration rules drastically tightened under President Donald Trump that well is running dry. At the same time, the September unemployment rate was 3.7%, the lowest since 1969.

"Incredible number just out," Trump tweeted on Tuesday, "7,036,000 job openings. Astonishing - it's all working!"

While consumers haven't yet been affected with a glut of meat still available, the unfilled jobs are preventing Cargill from producing higher-margin meat products, according to Brian Sikes, the agribusiness giant's head of protein.

The unfilled jobs mean "we can't do some value-added activities that we might get paid more for at the end of the line because we don't have the staff," Sikes said in an interview at his Wichita, Kansas office.

## Getting 'Creative'

Companies are experimenting with automation and robotics. For instance, Cargill has robots that stack boxes. But the progress is slow and expensive and, in the meantime, the company has had to be "creative" with incentives to draw new meatpackers, Sikes said.

While simply paying more is in the mix, it is not all of the equation, according to Sikes.

"We have evaluated our plant labor rates and implemented targeted increases to remain competitive," he said, though much of the focus has been on quality of life issues in the rural communities where most meatpacking plants are located.

"We've done these near-site health clinics to make sure there's good health-care options for our employees right there in that market so that we're a draw," Sikes added. "We do busing to get people in and pay for their busing, pay for their time."

In Schuyler, Nebraska, Cargill is working with the governor's office to secure funding for affordable housing. The company also provides bus service for employees at its Fort Morgan, Colorado-based plant, from Greeley and Denver, 84 miles (135 kilometers) away. In other areas, it's set up local clinics to provide free medical services.

## Tyson, Too

Cargill isn't alone in its efforts.

Tyson Foods Inc., the nation’s largest meat packer, is building a \$300 million chicken plant in Humboldt, Tennessee, and the company is already working with area schools to build needed skills for workers, said Hector Gonzalez, vice president of human resources in the poultry division.

Tyson has raised base wages, according to the company’s fiscal 2017 sustainability report. It implemented varying levels of hourly pay hikes at all poultry plants, moving the average hourly pay between \$12.88 and \$20.50, depending on the worker’s role. Meanwhile, it’s helping workers with literacy classes and to get their high school equivalency diplomas and citizenship, the report noted.

The labor shortfall isn’t limited to the meat industry.

Agricultural employers have been forced to boost wages more rapidly than many industries to keep pace with other sectors like construction, manufacturing and mining, CoBank economist Ben Laine said in an August report. The industry also isn’t immune to America’s current shortage of truck drivers. Fruit and tree nut producers boosted pay by more than 3.5% annually in the decade through 2017.

“It’s still a good time to be a meat processor,” Rabobank’s McCracken said. “The guys that are able to reduce costs because they don’t have the turnover, because they have these great labor practices in place, whether or not it’s higher wages or better benefits or better working conditions, they’re going to win.”<sup>19</sup>

## New Tariffs

U.S. beef is being hit with retaliatory tariffs by Canada and China, which will raise prices to importers and send them shopping elsewhere.

Import tariffs on U.S. beef to Canada and China are top of mind for the U.S. beef industry.

Canada implemented a 10 percent tariff on some U.S. beef products on July 1 after the U.S. moved ahead with tariffs on U.S. imports of Canadian steel and aluminum.

“Unfortunately, we are the direct victims of trade retaliation,” Kent Bacus, director of international trade and market access for National Cattlemen’s Beef Association, said in the Beltway Beef podcast.

The tariff applies to prepared and preserved beef, represented \$170 million of the \$800 million in U.S. beef sales to Canada in 2017. They were a small but significant part of sales to Canada, he said.

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<sup>19</sup> Parker, M., & Durisin, M. (2018). Unfilled jobs force meatpackers to boost worker benefits. Retrieved from <https://www.beefproducer.com/processors/unfilled-jobs-force-meatpackers-boost-worker-benefits>

“It’s a tough situation for us,” he said.

A 10 percent tariff is not a lot but added to a strong U.S. dollar compared with the Canadian dollar, it makes U.S. product more expensive and less competitive, he said.

“So, there’s a disincentive to buy American. If the whole point is to buy American, this is not really going about it the right way,” he said.

While it might bring some short-term victories to the U.S. steel and aluminum industries, beef producers are going to carry a big part of the retaliation, he said.

Across the globe, China raised its 12 percent import tariff on U.S. beef to 37 percent on July 6. The tariff comes as the U.S. is just starting to make inroads into China’s grain-finished beef market after being banned for 13 years.

It’s a small market, but U.S. beef was doing a good job in taking market share from competitors. U.S. exports grew at a steady pace from zero sales to \$30 million in sales in just six months, he said.

The U.S. Meat Export Federation was forecasting those sales to grow to \$70 million in 2018 and reach up to \$400 million in three or four years.

“And that’s with all those restrictions on hormones, beta agonists, traceability,” he said.

Without those restrictions, USMEF projects U.S. beef exports to China could reach \$4 billion annually in the next five years, he said.

“That’s huge. Last year, we exported \$7 billion total, and now we’re talking about a market with that much potential. But we’re not going to be able to realize that as long as we’re going to be in the middle of these tit-for-tat tariffs,” he said.

The additional duty is a tariff on importers, and they’re not going to buy U.S. product when they can buy product elsewhere for much less. He doesn’t know the U.S. administration’s long-term plan, but things are probably going to continue to escalate, he said.

“We need our country and the Chinese government to come and find a way that both of our economies can mutually benefit in the long-term because the future of our economies are intertwined. ... We are two of the biggest economies in the world,” he said.

The U.S. has economic superiority, and China has the population and growing middle class to provide a customer base.

The U.S. can either secure its place in the Chinese market or continue to cede future market share to competitors that are striking trade agreements with China, he said.<sup>20</sup>

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<sup>20</sup> Dumas, C. (2018). New tariffs chill U.S. beef export potential. Retrieved from <http://www.capitalpress.com/Livestock/20180706/new-tariffs-chill-us-beef-export-potential>

## Importing Beef?

One of the interesting trade events this year is that while U.S. beef exports are growing, so are U.S. beef imports. U.S. imports are up in 2018 compared to 2017, 1.23 billion pounds versus 1.21 billion pounds. When comparing 2018 and 2017 numbers from our normal import partners, the U.S. is importing less from Mexico by about 40 million pounds. But, the U.S. has found more beef from Canada, New Zealand, and Nicaragua.

Why do we both export and import such large amounts of beef? The key is that all beef is not the same. We export high value and low value cuts of beef, steaks for example. Most of our imports are trimmings to make more ground beef. The industry doesn't have enough cull cows and lean beef to make all the ground beef that consumers want to buy.

On balance, net exports (exports minus imports) have totaled 20.6 million pounds in 2018 so far, which is a big improvement from 2017's -121 million pounds during the same span. This big swing for the U.S. in the world market has been driven by South Korea. South Korea's beef import from the U.S. is up by 69.5 million pounds in 2018 compared to 2017.

The direct beef tariffs imposed at this writing are relatively small and have had little impact to date. Of, perhaps, more importance to the beef industry at this point are the indirect effects of the tariffs on other products.<sup>21</sup>

## Bees

Honey bees are an invaluable partner in the pollination of many crops. Fruit and nut trees would not be nearly as productive without honey bees. Honey bees will target one specific type of flower at a time which increases the likelihood that the right pollen will get on the right flower.

- There are approximately 50,000 bee colonies in Nebraska.
- Nebraska honey bee colonies produce more than 3.75 million pounds of honey annually.
- One honey bee will produce 1/12 of a teaspoon of 20 honey in its lifetime (about three weeks).<sup>22</sup>

Beekeeping is a niche market in Nebraska agriculture, with more than 300 active members of the [Nebraska Beekeepers Association](#) across the state. According to the [U.S. Department of Agriculture](#), there were 46,000 honey-producing hives in Nebraska in 2013.

<sup>21</sup> Martinez, C., & Anderson, D. (2018). How the new tariffs affect the beef industry → Southern Livestock Standard - The definitive news and information source for the beef cattle segment of the livestock industry. Retrieved from [http://www.southernlivestock.com/articles/marketing/how\\_the\\_new\\_tariffs\\_affect\\_the\\_beef\\_industry-13242-sls](http://www.southernlivestock.com/articles/marketing/how_the_new_tariffs_affect_the_beef_industry-13242-sls)

<sup>22</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

For most honey producers, beekeeping is a hobby or side job.

“It’s difficult to make a living as a full-time beekeeper. There are some around, but the larger number of beekeepers have a day job and keep bees on the side,” says Buzz Vance, who owns [Buzz’s Bees](#) in Lincoln. “Like farming, beekeeping is expensive to get into and requires a lot of know-how and hard work to make a living doing it.”

Vance, who acquired the nickname “Buzz” in college while pursuing a degree in entomology, has been keeping bees for more than 30 years. He started in college with two hives and now has 50.

“I’ve always had an interest in insects, and I have a master’s degree in entomology, so this is right up my alley,” Vance says. “I love being outdoors and like gardening; I enjoy having produce – honey – to show for my labor. Also, bees are incredibly fascinating. I never stop learning about them.”

The honey making process begins when worker bees collect sugary nectar from flowers to feed their colony. They suck the nectar from the blossom and store it in their honey stomach, which is different from their food stomach. When their honey stomach is full, the bees return to the hive and expel the nectar into honeycomb cells.

Hive bees then beat their wings rapidly to fan the nectar and evaporate its water content. Once the sugars in the nectar thicken into honey, bees cap off the cells with beeswax, sealing the honey into the honeycomb to eat later.

“In our part of the country between late October and March, there are no flowers in bloom, so a colony must store up food – mostly honey – that will feed them in winter months,” Vance explains. “Roughly 60 pounds of honey or more is needed by an average colony to survive the winter.”

Bees tend to store up more honey than they need for themselves, giving beekeepers the opportunity to harvest some of the honey in late summer.

“The beekeeper needs to be sure to not harvest too heavily, or the bees may come up short of food to survive the winter,” Vance says. “Harvesting and extracting honey is a lot of work, but it is rewarding.”

Beekeepers must check their hives at least every two weeks in spring and summer to monitor the health of the hive and add storage space if needed.

“To become a good beekeeper, a person needs to be able to spot predatory mites, evaluate signs of healthy versus diseased bees, understand how to respond to hive health issues and be hopeful,” Vance says. “A background in biology certainly helps.”

Many beekeepers sell honey at farmers markets and fairs. The Nebraska Beekeepers Association sponsors booths with honey for sale at the Lancaster County Fair and the Nebraska State Fair.

Vance says that few franchised grocery stores have local honey due to the small number of beekeepers who have access to commercial kitchens for the processing.

“The standards for selling face-to-face are easier to meet, so most beekeepers sell from their homes and farmers markets,” he says.

Scholl is information director for the Nebraska Beekeepers Association, which has monthly meetings with speakers who help beekeepers better understand their craft. Scholl’s favorite aspects of beekeeping are educating the public about honeybees at vendor booths and being out in nature.

“My wife and I both say when we’re out working with bees, it’s like an escape,” he says. “Honeybees are the most studied insect in the world, so we always discover something new.”<sup>23</sup>

## Beets

Sugar beets have been successfully produced in Nebraska for more than 100 years. Nebraska-grown sugar beets are a major contributor to the United States sweetener industry and are found in a wide range of food products, with some by-products going into livestock feed. The crop needs a long growing season, generally April to October, and days with abundant sunshine followed by cool evenings to facilitate the storing of sugar in the crop’s roots.

Approximately 90 percent of the sugar beets grown in the state are produced in the Panhandle.

- Nebraska generally ranks 5th in the nation for production of sugar beets and averages more than 1.3 million tons of production.
- The sugar beet is a root crop that’s used for sugar production. In fact, more than half of U.S. sugar production comes from sugar beets.
- When fully grown, a sugar beet is about a foot long, and it weighs between 2 and 5 pounds.<sup>24</sup>

Most growers in the Nebraska Panhandle use pull-type diggers for sugar beet harvest, but self-propelled diggers have been catching on, and they’ve provided some advantages for one farming operation.

In the eastern part of Nebraska, harvesttime is signified by combines rolling through corn and soybean fields, and semi loads of grain making their way to local elevators or grain bins. In the state’s Panhandle, however, it’s a different scene in September and October. Beet diggers

<sup>23</sup> Mozo, J. (2015). Nebraska Honey is Liquid Gold. Retrieved from <https://www.farmflavor.com/nebraska/nebraska-ag-products/nebraska-honey-liquid-gold/>

<sup>24</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

traverse fields, and trucks with side-dump trailers carry loads of sugar beets to one of several sugar processors in the region.

Sugar beet production traces its history back more than 100 years in the North Platte Valley. The name of one of the towns in the region, Melbeta, even means “sweet beet” in German. “There have always been beets in this valley,” says Nick Lapaseotes, who farms with his son, Nicholas, near Bridgeport.

Most of the beet diggers seen in the Panhandle are pull-type diggers — pulled by a tractor and unloading harvested beets into trucks traversing the fields right along with them. But the digger Nicholas Lapaseotes is operating is self-propelled — a Ropa euro-Tiger V8-4 XL, a 49-foot-long, yellow European-designed root crop puller with a 600-horsepower Mercedes Benz engine.

Although they aren’t the first in the area to use self-propelled machines, the Lapaseoteses have been using them for nearly 10 years. And while most still use pull-type diggers, self-propelled diggers have become more popular in the Panhandle.

“There are around six or seven self-propelled machines in the Panhandle area, compared to just a couple 10 years ago,” Nicholas says. “There’s also a growing market for used Ropas.”

The self-propelled digger affords some advantages, Nick says. With its own defoliating and scalping units on the beet head, the self-propelled machine eliminates the need for a separate operator for a defoliator — the machine that typically runs ahead of the digger. Because the self-propelled digger has a beet hopper, there’s also no need for a truck to drive alongside the digger as it travels through the field.

“With a self-propelled machine, one operator controls the defoliator, the scalper and the digger,” he says. “One machine does it all, so you don’t have to worry about the defoliator doing a poor job before the digger picks the beet up.”

Sugar beet growers are often required to plant on a multiyear rotation to prevent the spread of disease. While they typically field-finish once after harvesting to mitigate risk of cercospora and other diseases, the Lapaseoteses also follow up by drilling winter wheat as a cash crop in their rotation, or a cereal rye cover crop to hold the soil; their beet fields are rotated on a three-year cycle, with one year of wheat and one year of corn. So, being able to harvest sugarbeets on tougher terrain opens up more fields to plant beets for those two years in between.

“We’re able to rotate 100% of our acreage because we can travel over tougher terrain. With a pull-type digger, you need to have a truck with you. You wouldn’t be able to get a truck through this field,” Nicholas says, driving through a rolling, sandy field next to Courthouse and Jail Rocks in Morrill County. “We’re not cutting down on the amount of people we need for harvest, but we’re keeping trucks on the edge of the field rather than having them out in the field getting stuck.”

That’s one reason the Lapaseoteses been able to increase their sugar beet acreage in the last several years since Nicholas came back to the farm after graduating from college in 2014.

“We’ve increased our sugar beet acres quite a bit in the last two to three years, going from 1,500 to 1,900 acres,” he says. “We were able to get more shares in the cooperative [Western Sugar Co.] and rotate more of our acres. We’ve also expanded our farming operation in general. With more land available, we had the opportunity to plant additional circles to beets.”

After a rough start this year, the growing season ended on a good note for many sugar beet growers in the Panhandle, including the Lapaseoteses.

In early May, straight-line winds swept through the area, destroying grain bins, upsetting center pivots and tearing up sugar beet fields. “There were reports of 75- up to 100 mile-per-hour straight line winds. I’ve never experienced anything like that before,” says Nicholas. “It tore up the leaves pretty badly, and in some case wiped them out completely.”

The Lapaseoteses had to replant five of those fields in late May, which had been initially planted at the end of April. Setting the growing season back a few weeks typically means lower sugar content and yield. And while sugar content was lower, those replanted fields yielded above expectations.

“In terms of tonnage, this is one of the better fields I’ve dug this year,” Nicholas says of the field next to Courthouse and Jail Rocks — one of the replanted fields. “Large, but not huge beets — that’s what helps get tonnage up. With beets that are too big, too much of the top gets taken off going through the digger, so it’s really just a waste.”

At early harvest in late September, the beets in this field averaged 15.7% sugar and yielded 31.8 tons per acre. However, Nicholas notes if it weren’t for that windstorm, sugar content for the beets in this field might have averaged 18% to 18.5%.

Sugar content and tonnage are often considered inversely related. As tonnage increases, sugar content typically goes down. While sugar can range anywhere from 12% to 21%, it can still increase 1% every 10 days, from maturity (usually around late August or early September) until a killing frost.

Meanwhile, Panhandle growers also faced extended periods of 90-plus-degree-F temperatures, late-season hail events and a pest that’s becoming more problematic every year for the region — Palmer amaranth. “Weed pressure in certain areas, you’ve got glyphosate-resistant kochia. That’s something everyone deals with. Palmer is starting to be a bigger problem for us, too,” says Nick. “In corn, you can use other chemicals to control it. With sugarbeets, you’re pretty limited on what you can use.”

However, the Panhandle also received up to 5 inches more than the average annual rainfall — one of the reasons for this year’s above-average sugar content and tonnage.

“We’ve had good sugar content up to the mid-17s for September harvest, which is good for that time of year. Our replanted fields were in the low to mid-15s for sugar, and other fields were running up to the mid-17s,” says Nick. “Based on the last sample we took in August, it’s

looking pretty promising. So far, with beets that have been harvested, they're tracking pretty close to what they've been tested for. We're probably looking at a record crop."<sup>25</sup>

Fall is harvest season. Adams, 64, and his son, who farms with him, are working around the clock to dig sugar beets out of the ground before the freeze sets in. If they're delayed, there won't be enough to feed the Western Sugar Cooperative factory located less than a mile away.

And that affects the whole community. Western is the area's second biggest employer, next to the hospital, employing between 300 and 400 people depending on the time of year.

"It would be hard for me to imagine what this community would be like without sugar, without the industry," said Tracey Bentley, the factory's processing manager. "The number of jobs that people would no longer have...and then how that trickles down to everyone else. The people in the restaurants. The stores. The hospitals. The schools."

The factory is really humming this time of year as workers prepare for a busy Easter sales season.

Machines load frozen beets from an enormous outdoor pile onto 18-wheelers, where they are whisked to a conveyor belt that takes them to be cleaned, sliced, and cooked to extract pure sugar. The pulp that's left over is then taken to local ranches to feed cattle wandering snowy pastures.

Nothing goes to waste, Bentley explains.

## More Sour than Sweet

Things are a little slower on Rodney's farm. His beets are harvested, his fields are too frozen to tend, and he has time to mend machinery that will help with the next crop. He also has time to think and plan for the future.

Unfortunately, that brings him some trepidation. Sugar prices tanked when Mexico broke U.S. trade law and flooded the market with subsidized imports years ago. While that problem has been addressed, he says the aftereffects are still lingering.

"Sugar is at break-even or less right now, so it's made it difficult," he said.

Adams, a fourth-generation farmer, said he's hanging on by his fingernails. Meanwhile, some of his neighbors are leaving the sugar business altogether. Because the area's farmers cooperatively own the local sugar factory, the pain of one sugar farm is felt by all.

Adams and his colleagues from hours away discussed the economic stress at a recent meeting of Nebraska sugar beet farmers, which was held at the Gering Civic Center. Though folks were happy to reconnect with neighbors, few were in high spirits.

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<sup>25</sup> Harris, T. (2018). Finding a niche in sugar beets. Retrieved from <https://www.nebraskafarmer.com/crops/finding-niche-sugarbeets>

The mood turned even more sour as farmers learned of legislative attempts by large food manufacturers to flood the U.S. market with more subsidized imports to drive prices lower.

“We’ve got families right now that are going out of business. And we’ve got farmers who are having to sell assets to continue to grow sugar beets,” Adams explained. “But we can only do this for so long. We’re as efficient as we can be. We’ve cut to the barebones now. And we do need help to keep this sugar business alive.”

Two area farmers recently flew to Washington, D.C., to deliver that exact message to lawmakers who may be unaware of the gravity their Farm Bill vote carries.

Folks in Scottsbluff are hopeful these beet emissaries will be successful. The future of the town literally depends on it.

“Beets are the community, basically,” Adams said. “If we took beets out of this community, it would be devastating.”<sup>26</sup>

## Home Sweet Homegrown

Approximately 300 western Nebraska farmers grow 1.3 million tons of sugar beets a year on 50,000 acres, with an end product equal to about 4.5 million hundred-pound bags of crystallized sugar. This sugar is packaged and sold under 35 different labels, including Great Western (GW), Roundy’s, Surfine and Walmart’s Great Value brand.

Not only are sugar beets grown in the Panhandle of Nebraska, they also are processed there. In 2002, farmers joined forces and formed the [Western Sugar Cooperative](#) (WSC), purchasing five midwestern processing plants, including one in Scottsbluff. Across a four-state region, WSC has approximately 1,100 farmers whose production makes up about 10 percent of the nation’s sugar beet market. The United States produces 70 percent of the nation’s sugar consumption, and about 55 percent of that is derived from sugar beets.

“We are a cooperative, so we are grower-owned,” says Jerry Darnell, ag manager for Western Sugar in Nebraska and Colorado. “This creates the opportunity for the farmer to raise the crop, put it through the mill and then it goes to grocery store shelves, so the farmer has a stake through the process.”

For Scottsbluff native Jim Darnell – Jerry’s father – raising sugar beets is in his genes. Jim is a third-generation sugar beet farmer, whose grandfather hand-dug sugar beets.

“My grandfather let me pull my first beets with him,” Jim says. “At that time, they were harvesting one row at a time, 22 inches wide. Now we harvest six rows, 30 inches wide at a pass. It’s changed from the trucks I drove that held six or seven tons to trucks that now haul 30 tons.”

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<sup>26</sup> Nebraska Sugar Beets. (2018). Retrieved from <https://www.sugarpub.com/news/category/nebraska-sugar-beets>

The beets are cleaned and pass through a variety of processes in order to get to the granulated state as the bagged sugar with which most consumers are familiar. The beets are generally about 75 percent water, 20 percent sugar and 5 percent pulp. The pulp and molasses left over from processing aren't wasted; they are sold as feed. Even the green top that is cut when the beets are pulled out of the ground is used as fertilizer.

What is the difference between sugar refined from beets and sugar refined from cane? None, says Jerry.

"Sugar is sugar," he says, it all comes from sucrose.

Sugar beet production has greatly improved over the years, with better seed that is more resistant to pests and disease. This creates a better quality and higher yielding crop, says Jim, who utilizes 750 acres of his 4,000-acre farm for sugar beets. This is better for consumers, but also for the economy of western Nebraska.

"It makes us feel good as growers to know we are getting treated fairly," Jim says, noting that at the time the co-op was formed in 2002, it was doubtful the state's sugar beet industry would survive. "It was a very good time to purchase, and we have had great leadership. It's good to be in a strong position now."

Because it is grower-owned, Nebraskans can feel good about supporting this aspect of the state's economy, Jerry says. And it's easy to know if the sugar they are buying is local. Simply check the label, and if there is an "F" in the code, it came from the Scottsbluff factory.<sup>27</sup>

"The sugar beets that are raised here in Western Nebraska, they are used to produce gradually white, brown and powdered sugar that you see in your grocery market shelves," said Jerry Darnell, Vice President of Agriculture for Western Sugar Cooperative.

Some producers with large acres of sugar beets usually have the resources to harvest the crop by themselves. Other producers may have their sugar beet crop custom harvested, while the remaining producers may work with their neighbors to harvest the crop. One producer may have the defoliator; the other is "the puller" and all usually have semi-trucks to haul the sugar beets to the factory.

"We just completed our last root sample for the 2017 trap, and right now for Nebraska, we are showing 33.6 tons," explained Darnell. "The 33.6 tons will be a record for Nebraska. We have never yielded over 30 tons before so it is a really good crop we have in the ground."

The weather and temperature will dictate when and how much of the crop can be harvested at one time. If the weather is too warm, the sugar beets will not store well in the piles and rot. If that occurs, the harvest is postponed until the weather is cooler.

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<sup>27</sup> Patterson, H. (2014). Nebraska Sugar Beets: Confection Perfection. Retrieved from <https://www.farmflavor.com/nebraska/nebraska-ag-products/nebraska-sugar-beets-confection-perfection/>

If the fields are too wet, the pullers and trucks cannot get through the fields, and the sugar beet roots will be too dirty. Sugar beet production is also hindered by weather including wind, hail, late and early freezes.

"We had some more hail damage which defoliates the leaves of the beets and that causes the beet not to be able to grow," explained Darnell.

In September, the beets will be evaluated and ready to pluck from the ground. <sup>28</sup>

## Berries

An alternative crop has made its way to Nebraska.

Some farmers are now growing the aronia berry, also known as the chokeberry.

"We knew corn and soybeans weren't doing real well right now so we thought we'd put a few of our acres to this," said Mike Rader, owner of Rader Farms.

Rader Farms told NTV News they started growing the aronia berry three years ago because they heard the income potential was 10 times more profitable than corn.

At a low time for farmers across Nebraska, Rader Farms says it was the perfect time to put some of their acres towards the aronia berry.

"They were recommended to us by a friend. There are some people in Hastings who have planted them and are doing well with them. We just thought it's an alternative crop. We are hoping there is going to be a good market for them. There is starting to be," said Rader.

Rader said this is the first year they are truly harvesting them, bringing in equipment all the way from Poland.

"This machine just shakes them off and runs them up the conveyor. Then you run a fan to get rid of the leaves and such. You put them in totes and then into a reefer. They have to be cooled down to 40 degrees within four hours so that they don't spoil," said Rader.

Now, Rader Farms has over 38,000 plants on around 28 acres collecting around five pounds per bush.

"They're selling well on the coasts already. There's going to be a company trying to get it into Colorado more. Around here it's in the Hyvee stores, and then Hastings has it in a few stores too," said Rader.

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<sup>28</sup> Sherrod, B. (2017). Sugar beet production in Western Nebraska. Retrieved from <https://www.ksnbllocal4.com/scottsbuff/content/news/Sugar-beet-production-in-Western-Nebraska-440625983.html>

A registered dietitian with Hyvee says people consume the berries because of their antioxidant properties.

"Because of all of the disease fighting properties that also come along with it like cancer, diabetes, inflammation, and macular degeneration, etc. People are always looking for something to help prevent any type of disease, so it's definitely becoming more and more popular," said Kaiti George, a registered dietitian with Hyvee.<sup>29</sup>

## Corn

The "Cornhusker State" prides itself on its corn production. Corn is the most widely grown crop in Nebraska and has a variety of uses, from feeding livestock and poultry, to producing ethanol, distillers' grains and even bioplastics. Nebraska has a unique advantage, known as the "Golden Triangle," where the combination of corn, livestock, and ethanol production provides significant opportunity to add value at every step along the production chain. Nebraska is the third largest producer of corn in the country and second in ethanol production and distillers' grains.

There are 23,000 corn farmers across the state, producing six times more corn than in the 1920s.

- In 2014, 8.95 million acres were used for corn production in Nebraska.
- More than 1.6 billion bushels were harvested in 2014, making Nebraska the 3rd largest corn-producing state in the nation.
- Today's corn farmers grow 87 percent more corn per ounce of fertilizer than they did 30 years ago and have cut erosion by 44 percent through new tillage practices.
- Nebraska is home to approximately 25 operating ethanol plants that use corn to produce around 2 billion gallons of ethanol each year.<sup>30</sup>

High winds did their damage to Nebraska's corn crop this year. Farmers reported anywhere from 20 to up 70 bushels or more per acre on the ground from high winds before harvest at various locations across the state.

"This year there is even more incentive for farmers to have their residue grazed or baled to get rid of volunteer corn, given the high amounts of downed corn in the state," says Nebraska Extension beef systems specialist Mary Drewnoski. "Grazing is traditionally favored as a method of using residue versus baling, because it leaves much more cover and allows cattle to be selective, so spring calving cows can be maintained without any supplement."

<sup>29</sup> Kummer, L. (2018). Nebraska farmers grow berries that help fight diseases. Retrieved from <https://nebraska.tv/news/local/nebraska-farmers-grow-alternative-crops>

<sup>30</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

With additional corn on the ground this season, there are risks with grazing and a need for extra management and labor when using cornstalks. Cow-calf pairs can safely graze up to 10 pounds of dropped ear corn and fed 2 pounds of dry matter from distillers grain a day, allowing cows to maintain bodyweight and still put 1 to 1.5 pounds daily gain on the calves.

Because of the extra energy, late weaning is an option. The basic rule of thumb from Drewnoski is that if there is more than 10 bushels per acre of dropped ears on the ground, cattle will need to be adapted and the amount of access restricted until they become accustomed to a corn-based diet. "Unless farmers have a pivot fence, the extra labor of restricted grazing of cornstalks can be prohibitive, especially for producers that have cattle on stalks far from home," she explains.

This year, baling might be the more viable option with the right rake. "Some producers have reported removing 80% of the ears" through this method, Drewnoski says. "This is not usually something I would suggest, given that most of the cover will be removed, increasing the risk of erosion," she explains. "But it may be a way to reduce risk of acidosis and reduce volunteer corn at the same time."

The amount of crop residue increases proportionately with the amount of grain produced in the field, so if you know the yield, you can calculate the amount of residue. "With 200-bushels-per-acre corn and 20-bushels-per-acre ear drop, for example, you would have 5.38 tons of residue including stem, leaf, husk, and cob in the field and 1,120 pounds of corn grain," Drewnoski notes. "Assuming that by baling you removed 90% of the residue and 80% of the downed ears, then a bale of residue would be about 9% corn," she says. "If you had 40 bushels per acre in a 200-bushel-per-acre cornfield, then the bale would be about 18% corn."

Bales could be ground to eliminate sorting all together, or you can feed the bales in round bale feeders without grinding. In that case, cattle will be selective, so 20% to 30% waste of mainly stems and cobs would be expected. Drewnoski suggests sampling the bales to formulate a ration because the amount of corn and residue will vary. "Samples could be obtained during the grinding process or by using a sharp hay core probe," she says. "When sending in the samples for analysis, make sure to have starch analysis marked to find out how much corn is in the bale, because corn is about 70% starch."<sup>31</sup>

## Popcorn

An ample irrigation supply, favorable climate, and rich soils have allowed Nebraska to be the top producer of popcorn in the country for several years. Approximately 45 percent of the U.S. popcorn supply is produced in Nebraska. The production process for popcorn is very similar to that of field corn, and to most people, a corn plant and popcorn plant will look very similar.

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<sup>31</sup> Arens, C. (2018). Lessons learned from dealing with excessive downed corn. Retrieved from <https://www.nebraskafarmer.com/corn/lessons-learned-dealing-excessive-downed-corn>

Yields from one acre of popcorn range from 50 to 100 bushels, depending on production techniques and the use of irrigation.<sup>32</sup>

## Dairy

Nebraska's wide grasslands, fields of golden corn, and gushing aquifers make the state a nearly perfect home for cows content to live a quiet life of chewing cud and being milked.

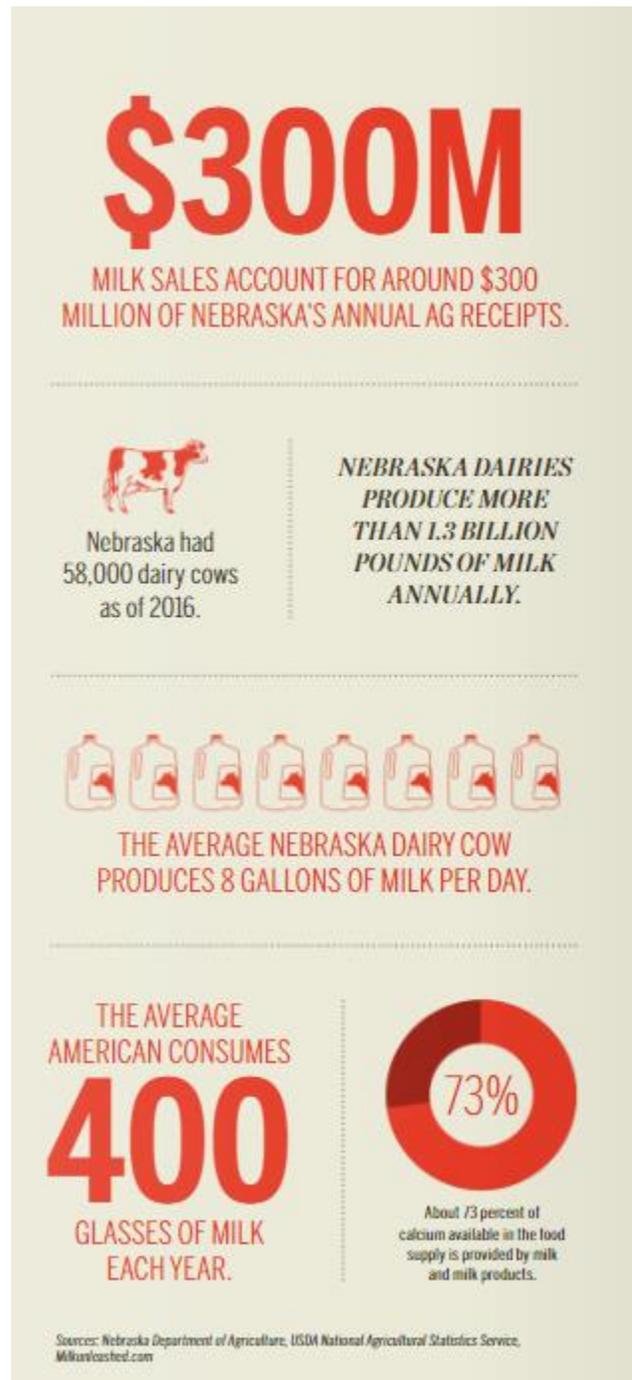
That was the sales pitch the past several years as Nebraska sought to woo dairy farms from states like Texas and California, where the Holsteins were being squeezed out by drought, development and environmental regulations.

Last year, it seemed to be working. After decades of decline, the number of registered dairies in Nebraska bumped from 181 in 2014 to 184 in 2015, according to the state Department of Agriculture. But it turned out to be more of a blip than a renaissance. The state lost 20 registered dairies as of September, dropping the total to 164.

It's not because of a lack of interest in the state. Nebraska has a list of dairy farmers who have said in writing they'd be happy to move here, state Ag Director Greg Ibach said during a recent interview. The problem is that they can't find anyone to buy their milk.

"All of the sudden the plants that were begging for more milk, the cows caught up with the amount of processing capacity," said Rod Johnson, executive director of the Nebraska Dairy Association. "The pipeline is full. "It's an issue up and down the Interstate 29 corridor, the dairy belt of the Midwest, Johnson said.

Dairy Farmers of America, the main cooperative force in Southeast Nebraska, confirmed it doesn't need any more milk from the state. "Due to a number of factors,



<sup>32</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

including the export market, supply is currently outpacing demand in the Nebraska area,” spokeswoman Kim O’Brien said in an email.

In the summer of 2016, dairy farmers were losing on every gallon because of overproduction, although prices have rebounded slightly since. The National Milk Producers Federation recently reported prices in the region ranging from \$14.20 to \$15.70 per 100 pounds.

In August (2016), the U.S. Department of Agriculture announced it would buy 11 million pounds of cheese to help reduce a 30-year-high national surplus. The cheese is to be distributed to schools and food banks across the nation. U.S. butter and cheese has been expensive on the world market for much of the past couple years compared with dairy from other places like Europe and Australia, causing U.S. suppliers to lose market share, although price disparities have narrowed in September, according to the [U.S. Dairy Export Council](#).

## Cash Cows?

Dairy is an economic development cash cow. A study done last year by the state Ag Department at the direction of the Legislature found a single cow has a \$5,000 local economic impact.

“Taken a step further, Nebraska’s 55,000 dairy cows generate \$275 million annually in local economic activity,” the study said. That doesn’t include the value added by Nebraska’s 10 milk processing plants.

In two other studies, economists at Iowa State University and the University of Minnesota estimated a dairy cow’s statewide economic impact with in-state processing at \$23,000 and \$25,000, respectively. Hoping to tap into the rich dairy bounty, a coalition of state commodity groups has been sinking time and effort into attracting new processors to Nebraska. “We call ourselves [Grow Nebraska Dairy](#),” said Johnson.

The issue, he said, is that processors want to know there are enough cows and milk to meet their needs, but to get those farmers, the state needs a processor. “It’s kind of the chicken or the egg, which comes first? Our challenge is to bring everybody together at one time,” Johnson said. Half of the state’s 10 processors, including Prairieland Dairy near Firth, process milk produced by their own cows.

Dwaine Junck gets up each morning at about 5 to check the cows and get his kids ready for school. His family has run a dairy near Carroll since the 1940s. For him, Nebraska’s full milk pipeline means less competition and lower prices for his milk. And the declining number of dairies in the state means fewer local businesses catering to dairy’s unique needs.

“If we had more dairies in the area ... there would be more support industries, the equipment dealers, the repair people,” he said. “Well, we can’t get more dairies in the area if there is no place to sell the milk.” His milk went to a string cheese processing plant in Ravenna until Leprino Foods closed it in 2013 citing, among other reasons, difficulty in getting enough milk. <sup>33</sup>

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<sup>33</sup> Growing Nebraska’s livestock sector. (2016). Retrieved from [https://journalstar.com/business/agriculture/the-milk-pipeline-is-full/article\\_47e7e83c-6baf-58e8-959e-48d87bfb0168.html](https://journalstar.com/business/agriculture/the-milk-pipeline-is-full/article_47e7e83c-6baf-58e8-959e-48d87bfb0168.html)

“It’s a very difficult decision for us to make,” said [Mike Reidy](#), the Denver’s Leprino Foods Co senior vice president of corporate affairs said in 2013.

The plant’s operations will be shifted to Leprino’s Fort Morgan factory, Reidy said. The Fort Morgan plant currently makes frozen, shredded cheese and associated whey products.

Reidy said the company looked at where it makes products, where clients of those products are located, and Leprino’s sources of milk supplies in making the decision to close Ravenna.

Leprino acquired the plant from Dairy Farmers of America in 1998, he said.

“We have a growing need for the string cheese products made at that plant, and we have a declining milk supply in that part of Nebraska,” Reidy said. “We needed to make investments in string cheese, and it makes more sense for us to close the facility in Nebraska and move that production to Fort Morgan.”<sup>34</sup>

Nebraska’s dairy herd peaked in 1934 with 820,000 cows producing 2.9 billion pounds of milk annually. Today, the number of cows is closer to 55,000, but each of them produces more milk.

In 1934, each cow produced an average of 3,500 pounds of milk; today, an individual cow produces an average of more than 21,000 pounds, thanks to improved nutrition and genetics.

Nebraska’s dairy farms have also gone through consolidation. The state lost 553 dairy farms over the past 15 years, a 75 percent decrease. The average number of cows per dairy farm went from 98 in 1999 to 214 in 2010, according to USDA statistics. In 2015, 52 percent of the dairy cows in the state were housed on just 14 farms.

Still, the amount of milk produced in the state has remained relatively stable at just over 1.1 billion pounds a year, according to USDA statistics. The vast majority of Nebraska’s remaining dairy farms are in the eastern portion of the state, where they are closer to processors, highways and population bases like Lincoln and Omaha that have plenty of mouths to gobble up ice cream and cheese.<sup>35</sup>

## What comes first?

Like many aspects of agriculture in Nebraska, dairy farms have evolved over the years. Modern-day dairies in the state vary in size and structure, and all contribute to local economies by creating jobs, adding to the tax rolls and increasing demand for feedstocks. However, today’s Nebraska dairies are not without their challenges to expand and remain profitable. It’s not that the state’s dairy owners aren’t willing to grow their herds, or that outstate dairies don’t have the desire to locate here. It’s mostly about processing. Under the direction of the Nebraska Legislature, the Nebraska Department of Agriculture (NDA) was charged with developing and

<sup>34</sup> (2013). Retrieved from <https://www.bizjournals.com/denver/news/2013/08/30/denvers-leprino-foods-to-close.html>

<sup>35</sup> Growing Nebraska’s livestock sector. (2016). Retrieved from [https://journalstar.com/business/agriculture/the-milk-pipeline-is-full/article\\_47e7e83c-6baf-58e8-959e-48d87bfb0168.html](https://journalstar.com/business/agriculture/the-milk-pipeline-is-full/article_47e7e83c-6baf-58e8-959e-48d87bfb0168.html)

writing a statewide study to identify the primary challenges facing the state's dairy industry. The Dairy Growth and Development Study was submitted to the Legislature in March 2014.<sup>36</sup>

"Research confirmed what we suspected, that Nebraska needs more dairy processing in order to grow the industry," NDA Ag Promotion Coordinator Steve Martin said. "Part of the challenge has been the 'what comes first syndrome.' The processors want to make sure they have a robust milk supply, and the producers want to make sure they have a place to take their milk before they expand."

Processing milk into products is important to Nebraska since cheese, butter, yogurt, and ice cream are easier to transport than fluid milk. "Dairy products have a longer shelf life than fluid milk, so it allows for more time to get them to retailers," said Martin. "Nebraska's central location and access to the I-80 corridor means that a processor located here can reach most of the U.S. population in two days or less." Martin added that consumer demand for processed dairy foods has seen steady growth while the demand for fluid milk has decreased gradually in recent years. The effort to expand the dairy industry in Nebraska has been going on for several years, but when the Dairy Growth study was released, it became a priority to put a strong focus on recruiting processors to the state.



The Junck Family of Junck Dairy Farm in Carroll, NE

## Nebraska

- In the state of Nebraska, there are about **160** licensed dairy herds.
- Nebraska is the **26th** largest milk-producing state in the U.S.
- Nebraska dairy farms produced approximately **151 million gallons** of milk in 2015.
- Nebraska farms generate more than **\$232 million** in milk sales annually.
- In Nebraska, the average dairy cow produces about **7 gallons** of milk per day. That's more than **2,620 gallons** of milk over the course of a typical year.
- Nebraska has **6 plants** that process one or more dairy products.
- It takes about **48 hours** for milk to travel from the farm to the dairy case.

Source: <https://www.midwestdairy.com/farm-life/dairy-in-the-midwest/>

Initially, NDA, the Nebraska State Dairy Association, the Alliance for the Future of Agriculture in Nebraska, and the University of Nebraska-Lincoln Extension formed a partnership to consolidate efforts to recruit dairy processors to Nebraska. Eventually, the Nebraska Department of Economic Development and the Nebraska Public Power District joined the team,

<sup>36</sup> Dairy Insert. (2018). Retrieved from <http://www.nda.nebraska.gov/promotion/feature/2018-VIII-Dairy-Insert.pdf>

which refers to itself as Grow Nebraska Dairy. The team also relies on community leaders and industry experts for input. “Each partner has its own strengths and expertise,” said Martin. “This has allowed us to supply prospective processors with important information such as availability of natural resources, utility access, potential building sites and contacts of dairy producers in the state.”

Members of the team have been proactive at several trade shows and events where they can get face time with decision-makers in the dairy processing industry. “We’ve gone to networking events such as the International Dairy Foods Association Dairy Forum as well as trade shows like the Food Expo in Chicago and the Cheese Expo in Milwaukee,” said Martin. “It’s also important we stay connected to dairy farmers by attending events like the World Dairy Expo and the World Ag Expo.” Martin said that Grow Nebraska Dairy has a promotion that it refers to as the First Mover Advantage. The team has worked with consultants and local entities to identify specific locations where a dairy processor could quickly build and operate.<sup>37</sup>

**WATER, LAND, OPPORTUNITY**



Wakefield Farms, LLP  
Northeast Nebraska

**NEBRASKA AG FACTS**

- 1st in Irrigated Acres
- 2nd in Ethanol Production
- 3rd in Corn Production (66% irrigated)
- 4th in Alfalfa Production (43% irrigated)
- 5th in Soybean Production (48% irrigated)
- 9th in Silage Production

Courtesy of USDA NASS

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**NEBRASKA WATER FACTS**

- The High Plains Aquifer under Nebraska has five times the amount of water as Lake Erie.
- Ground water is managed by local Natural Resource Districts with a long-term goal of sustainability. Regulations vary based on location.

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rod@nebraskamilk.org  
www.nebraskamilk.org



**NEBRASKA DAIRY**

**“WE HAVE BEEN DOING BUSINESS IN NEBRASKA FOR 20 YEARS AND IT HAS BEEN GOOD TO US.”**

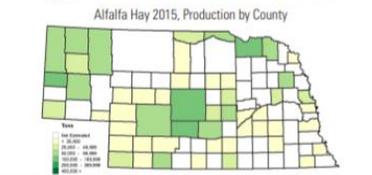
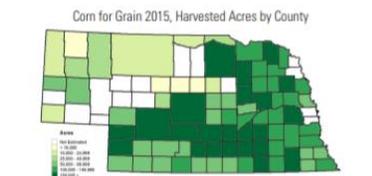
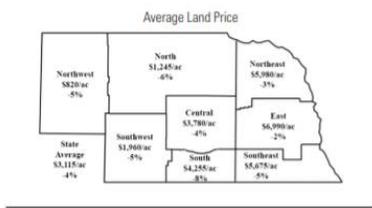
**BUD MOUW**  
Wakefield Farms, LLP

SEE WHAT  
**NEBRASKA**  
CAN DO FOR  
**YOU**

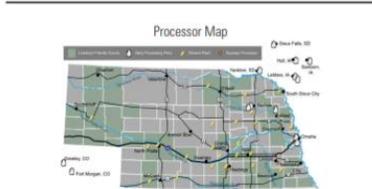
<sup>37</sup> Dairy Insert. (2018). Retrieved from <http://www.nda.nebraska.gov/promotion/feature/2018-VIII-Dairy-Insert.pdf>

Source: <https://www.nebraskamilk.org/wp-content/uploads/sites/6/2017/07/Nebraska-Dairy-See-What-Nebraska-Can-Do-for-You.pdf>

“These sites are what we like to call shovel-ready,” said Martin. “That means a lot of preliminary scouting has been done to assure potential processors that everything they need is in place for them to start the siting process right away.” The First Mover Advantage tells potential processors that the first one to build a dairy processing plant in Nebraska will have first choice of those shovel-ready sites. The processor will also have the first opportunity to work with local dairy producers to assure a steady milk supply. It also will be the first one to attract a labor force in that area. The dairy industry remains a vibrant segment of Nebraska agriculture. If it is to continue to be profitable and grow, it will take efforts like that of the dairy team partnership to attract processors to the state.<sup>38</sup>



Nebraska has abundant feed sources; we produce plentiful corn, distiller’s grains, soybeans, alfalfa, silage and hay. Eliminating shipping costs keeps ration costs low.

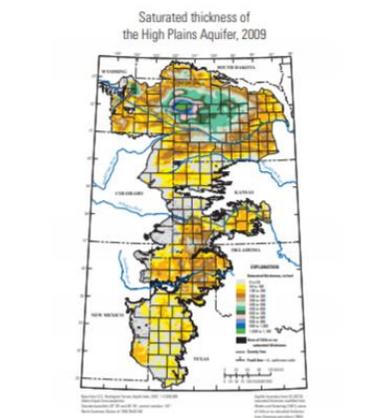
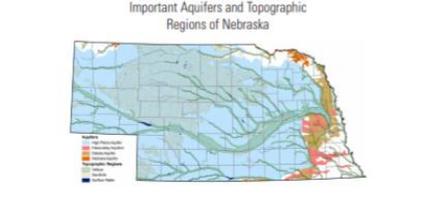
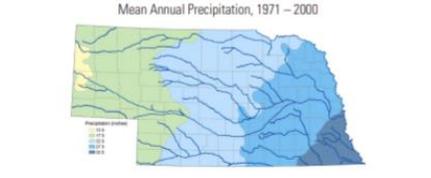


Five in-state and five out-of-state processors purchase Nebraska milk. Nebraska is the second largest ethanol producer in the nation with 25 plants producing over 6 million tons of distiller’s grains.

**Welcome to Nebraska –  
See What Water, Land and  
Opportunity Can Do for You!**

**Nebraska has a vibrant dairy industry, with cow numbers and milk production on the rise. Access to plentiful crops and feedstuffs, often next door, helps keep ration costs low. Welcoming communities with a mix of small towns and progressive cities means a high quality of living.**

Precipitation varies across the state, from east to west. Nebraska is unique in that irrigation is used to supplement rainfall. This enables Nebraska to produce consistent, high yields even in drought years.



The High Plains Aquifer under Nebraska is managed to fulfill current demands and for generations in the future. Ground water levels in Nebraska have remained steady or increased for most of the state.

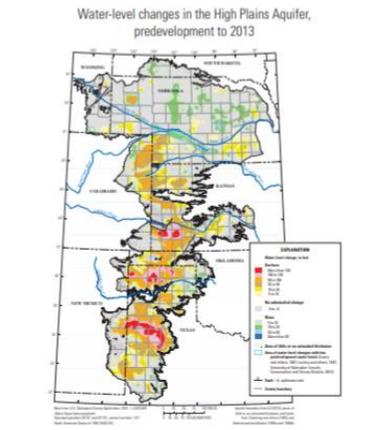


Image Source: <https://www.nebraskamilk.org/wp-content/uploads/sites/6/2017/07/Nebraska-Dairy-See-What-Nebraska-Can-Do-for-You.pdf>

<sup>38</sup> Dairy Insert. (2018). Retrieved from <http://www.nda.nebraska.gov/promotion/feature/2018-VIII-Dairy-Insert.pdf>

## Dairy Diversity

“Maintain a family-oriented dairy farm that produces affordable, nutritious milk.” That very simple but robust mission statement drives Classic Dairy, located in southeast Nebraska near Diller. The dairy has been operating for 22 years and supports several generations of the Engelman family, whose farming roots run deep.

Classic Dairy: It Started with Two Brothers Back in the mid-90s, Dean and Gail Engelman decided that if they were going to continue to farm, their best option was to team together and begin a dairy operation. They expanded their 150-cow dairy herd to 600 head and incorporated Classic Dairy in 1996. Also expanding were Dean’s and Gail’s families. Dean and his wife, Ann, eventually had three children (two sons and a daughter) while Gail and his wife, Brenda, had two daughters. The two brothers discovered very quickly that trying to run a dairy by themselves was extremely time-consuming leaving little time to spend with their families. Dean said he and Gail came up with a master plan. “We were milking something like 18 hours a day, so Gail and I said, ‘let’s expand,’” Dean said.

The idea sounded a bit crazy to their spouses at first. However, the brothers explained that by growing their herd they could produce a lot more milk, which meant they would be in a financial position to hire more employees. They eventually grew their herd to the present number of 1,100 cows. That has allowed them to hire up to 16 full-time employees. “We have a really good work force,” said Dean’s wife, Ann. “We have one employee who has been with us since the beginning, and two others who have been here for 15 years. We provide housing for our employees allowing most of them to live within seven miles of the dairy if they so choose.” Ann said that they encourage their employees to support local schools and businesses and remember the same lesson the Engelman’s learned early on. “We expanded our dairy so we could spend more time with our families, and we want our employees to be able to do the same thing,” she said.

Raising row crops is a big part of the Classic Dairy operation, which includes 3,500 acres of corn, soybeans, and alfalfa. “We raise all our own dry corn and corn silage and about half of the alfalfa we use,” said Dean. “We have enough land, and it’s close enough in proximity, to allow us to utilize the manure from the dairy as fertilizer.” Utilizing the manure is just one aspect of Classic Dairy’s sustainability and conservation plan. That plan starts with efficient use of water. “Even though we have a good water supply here, we want to utilize it the best we can so we use it four ways,” said Dean. The first use of the water is to cool down the milk. From there the water goes to a holding silo and then it is used to flush out the milking parlor. After that, the water goes into lagoons to be used a third time to flush the free stall area where the cows are housed.

## A Different Style of Dairy

While Classic Dairy is a prime example of a modern-day Nebraska family dairy operation, approximately 180 miles to the northeast near Emerson, is another dairy that is much larger, has a slightly different operating structure and supports many families. Wakefield Farms LLP began milking cows just four years ago but has had a significant impact on the local economy. The two dairies have different stories that reflect the diversity of Nebraska's dairy industry, an industry that looks for continued expansion and welcomes an array of dairy operations.<sup>39</sup>

Wakefield Farms also brings another important value to their area, jobs. "We hire around 43 full-time workers here at the dairy, and then we have another 20 employees at our 6,000-head calf ranch just up the road from here," said Bleeker. Those 63 jobs mean pumping money into the local communities and generating tax dollars for village and county governments.

One of the challenges for the dairy industry nationally has been the ability to maintain a reliable workforce. Bleeker said he is fortunate to have some positive factors that has aided Wakefield Farms in attracting workers to its operation. "Being close to larger population centers like Sioux City and South Sioux City is part of it," said Bleeker. "But more importantly is being close to Wakefield. It's a town that has embraced cultural diversity. Almost my entire workforce is Hispanic, and the families say they like living in Wakefield. It's all been part of me being able to keep a reliable labor force."

Even with a large number of cows at the dairy, Bleeker says animal care is a top priority in their operation. "It doesn't matter if you're milking two cows or 5,000 cows, it's still all about each individual cow," he said. The cows are housed in large ventilated barns that include a myriad of fans and sprinklers to keep them cool in the summer, and then, of course, they are insulated from the elements in the winter. Once milked, the cows relax in sand-bedded stalls that are maintained on a regular basis. The animals are also monitored continuously for health.

"I have a crew dedicated to walking pens and pulling any cow that needs a little T-L-C," said Bleeker. "We put them in our hospital barn and provide them with any type of health care they need whether it's maintenance or medical treatment." And when it comes to how his cows are treated, Bleeker maintains a zero-tolerance policy. "The fastest way off this farm is to mistreat a cow," said Bleeker. "One time and you're out."

In regards to the future of the dairy industry in Nebraska, Bleeker says, "I think Nebraska is a great place to dairy but needs more processing. There's not a lot of processing in Nebraska and when you have to pull product a long way the freight kills you."

State and industry organizations have teamed together the past several years to make a concerted effort to attract dairy processors to Nebraska and grow the industry as a whole in the state. The Nebraska dairy team includes the Nebraska State Dairy Association, the Nebraska

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<sup>39</sup> 2018- VIII- Dairy Article. (2018). Retrieved from <http://www.nda.nebraska.gov/promotion/feature/2018-VIII-Dairy-Article.pdf>

Department of Agriculture, the Nebraska Department of Economic Development, the University of Nebraska–Lincoln Extension, the Nebraska Public Power District, A-FAN (Alliance for the Future of Agriculture in Nebraska), as well as other local partners. Team members have been active at national trade shows and industry meetings promoting the positive advantages of locating dairies and dairy processing in Nebraska. With the dairy team’s efforts and the success of operations like Classic Dairy and Wakefield Farms, the industry will continue to be part of growing Nebraska.



## No Humans Needed? Robotic Dairies

Robotic milking machines are not completely new technology, but they are fairly new in Nebraska. There are currently three robotic dairies operating in the state (Plainview, Carlton, and Creston) with more expected in the future. The dairies feature automated equipment that washes the cows’ udders and then attaches the milking machine with no human interaction needed.

The robotic dairy setup accommodates up to 60 cows at a time. The cows also wear electronic collars that identify them and their movements and collect

other data. The sophisticated computer setup at some of these dairies can measure the amount of feed each cow eats, how much milk it produces each day and health information about each animal. In addition to the robotic milking equipment, there can be large automatic sweepers



that roam the parlor floor pushing scattered feed back to where the cows can reach it. When the task is completed, the robotic sweepers hook themselves back up to be recharged.

Rod Johnson, executive director, Nebraska State Dairy Association and Midwest Dairy, said the primary advantage of robotic dairies is labor force management at a time when it can be difficult to find enough outside employees. "It's been a good way to bring back the next generation to our dairy farms," said Johnson. "Robotic dairies have allowed expansion of current herds, with the possibility of future expansion without having to add employees. It allows for more flexible scheduling, freeing up quality time to be spent with families." Growth of robotic dairies in Nebraska is expected to be gradual as it does require a strong commitment and significant investment in the operation.<sup>40</sup>

Robotic dairy operations may seem like a thing of the future. And, in fact, they were in Nebraska until last month.

That's when the Demerath Farms dairy near here made state history when it began using four robotic milking systems on its expanding dairy operation. At maximum capacity, the dairy will milk 240 cows, three times a day.

Bill Demerath said the day-to-day work on the farm has, indeed, changed since the robots were installed Feb. 21.

"We'll be able to come in and do our chores, but we can do them whenever we want," Demerath said. "In the old (milking) barn, we would've walked in at 5:30 in the morning. Four hours in the morning, four hours in the afternoon we had to be milking cows, so we couldn't get anything else done."

For Demerath, the switch to robotic milking was a long process.

"I've been working with Norfolk Dairy Systems, and we've kind of been through five years of this to get to this point," he said. "We wanted to increase the herd without increasing labor. We needed a new barn. Our other free-stall barn was 40-plus years old. So, we decided to go with this."

With the robots, the cows are able to essentially milk themselves.

"In this barn, they'll milk 24 hours a day," he said. "There's just more flexibility, better flexibility."

As part of the expansion of the operation, a new barn was built housing four robots, two on each side of the barn.

"Each robot can handle about 60 head. So, we can do about 120 on each side," Demerath said.

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<sup>40</sup> 2018- VIII- Dairy Article. (2018). Retrieved from <http://www.nda.nebraska.gov/promotion/feature/2018-VIII-Dairy-Article.pdf>

The cows wear an electronic collar that can track their activities and record information regarding milking. The collar identifies which cows are being milked, and information is sent to Demerath's smartphone.

The cows had to be trained to use the robots, just as their human handlers did. They are fed a pelleted feed while being milked by the robot. It's used as an incentive for them. If they come to the robot to be milked, they receive their pelleted feed.

The robot works by attaching to each of the four quarters of the cow's udder and then detaching when the cow is milked — all on its own.

The milk is then transported to a bulk tank — a large storage tank that keeps the milk cool until it can be put on a truck and hauled away. But the milk must go through a cooling process to take it from the cow's temperature, 104 degrees, to the temperature of milk in the bulk tank, 38 degrees. A plate cooler is used to cool the milk.

"We're dropping that to 55 degrees before it hits the bulk tank, and that's just with ground water. All you're doing is just running milk by water to cool it. That's what a plate cooler is," Demerath said.

The milk is sold to Associated Milk Producers Inc., which picks it up every other day.

Demerath said training the cows is going better than expected.

"Things are going very well. Even the guys who put the robots in said our cows are taking to it extremely well compared to some other barns. So, I was amazed," he said.

The cows also are offered every comfort when they are not being milked. They have access to large brushes that they can utilize as back scratchers.

"It's just for comfort. It gives them something to do, helps to keep themselves clean," Demerath said. "It stimulates blood flow in the cow. It's relaxing to them."

Demerath said time that used to be spent milking can now be devoted to other tasks, such as cleaning stalls more frequently.

"Happy cows, comfortable cows. That's the whole thing. That's why we have sand bedding," he said.

The sand is placed in single-cow stalls in the center of the four pens where cows can lay down when they are not eating or being milked.

Then, when they are hungry or are ready to be milked again, they are able to leave the bedded stalls, and the process starts over again.<sup>41</sup>

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<sup>41</sup> Schnoor, K. (2018). Plainview dairy first of its kind in Nebraska. Retrieved from [http://norfolkdailynews.com/news/plainview-dairy-first-of-its-kind-in-nebraska/article\\_6059bd70-04da-11e7-8154-97375c1d5a3f.html](http://norfolkdailynews.com/news/plainview-dairy-first-of-its-kind-in-nebraska/article_6059bd70-04da-11e7-8154-97375c1d5a3f.html)

According to robotic dairy building Walter Aschoff, the owner, and president of Aschoff Construction of Osmond, Nebraska is behind the curve when it comes to robotic dairy farms. In particular, Iowa, Minnesota, and Wisconsin have large numbers of automated and robot-equipped dairy farms.

What's more, the United States, as a whole, is still behind some other nations. A Netherlands-based agriculture manufacturer, which specializes in robotic milking machines, estimates that 2 percent of dairy cows in the U.S. are milked using robots. By comparison, that number is about 30 percent in the Netherlands.

"We've been a little bit slow to the game," Aschoff said.

Although the Larson farm is one of the few of its kind in Nebraska for now, automation and robotics are already an accepted way of life in the dairy industry.

Aschoff said robots have been around a long time on dairy farms. Milking machines and robots have been commercially available since the early 1990s and started to enter the U.S. in the early 2000s. The numbers have climbed in the past decade and will continue to do so, he said.

"Eventually, driven by the necessity of it, we'll have milking robots even in standard milking parlors — doing some tasks, if not all of them. This is just the first step into it," he said.

Dairy equipment suppliers estimate that by 2025, up to half of all dairy cows in the U.S. will be milked by machine.<sup>42</sup>

## Farmers

Farmers in Alabama and Nebraska joined with a Nebraska-based fair-trade group Thursday to sue the U.S. Department of Agriculture over the agency's cancellation of an Obama-era plan that would have made it easier for farmers to demand better treatment when they contract with meatpacking companies.

The lawsuit seeks to reverse the USDA's October decision to vacate the Farmer Fair Practices Rule — regulations that would have, among other things, reduced the burden of proof farmers face to sue over contracts and practices they believe are unfair, discriminatory, or deceptive.

"We know from decades of evidence that massive agribusiness companies don't hesitate to use their power to abuse these farmers, and the Farmer Fair Practices Rule was a crucial step to restoring fairness in the market," said Anne Harkavy, executive director of nonprofit legal group Democracy Forward, which filed the lawsuit on behalf of Lincoln, Nebraska-based Organization

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<sup>42</sup> Gebhart, N. (2018). Dairy Farm Takes Advantage of Robots. Retrieved from [http://norfolkdailynews.com/news/dairy-farm-takes-advantage-of-robots/article\\_1ed00e96-2b7f-11e8-b64f-5f0c188cd9dd.html](http://norfolkdailynews.com/news/dairy-farm-takes-advantage-of-robots/article_1ed00e96-2b7f-11e8-b64f-5f0c188cd9dd.html)

for Competitive Markets; Nebraska farmer James Dinklage; and Alabama farm couple Jonathan and Connie Buttram. "It should be restored either by USDA or by the court."

USDA spokesman Jake Wilkins declined to comment, saying the agency doesn't discuss pending litigation.

The rules were first proposed by the USDA in 2010 but were not released until last December in the final days of President Barack Obama's administration. They were scheduled to take effect on April 22, but President Donald Trump's administration delayed them for six months before the USDA announced in October that it would not implement them.

The suit, filed in the 8th U.S. Circuit Court of Appeals, alleges Agriculture Secretary Sonny Perdue ignored thousands of comments in public hearings and submitted in writing and unlawfully sidestepped directives in the 2008 Farm Bill mandating some of the rules be enacted.

Trade groups for the meatpacking industry, including the National Chicken Council and the National Pork Producers Council, had complained that the rules would lead to costly lawsuits and would reduce competition.

Some companies, such as Tyson Foods and Pilgrim's Pride, require chicken and pork producers to enter into contracts that farmers say set their compensation at unprofitably low levels and force them deeply into debt.

Several court rulings have interpreted federal law as saying a farmer must prove a company's actions harm competition in the entire industry before a lawsuit can move forward. The rules would have eased that high burden of proof.

The elimination of the rules has helped large multinational corporations get the upper hand on farmers, said Joe Maxwell, a Missouri hog farmer and executive director of the Organization for Competitive Markets, a nonprofit think tank focused on antitrust, trade policy, and competitive markets.

"In doing so, Secretary of Agriculture Perdue and the administration have thrown America's farmers to the wolves, telling them that their family businesses don't matter," Maxwell said.

Named in the lawsuit are the USDA, Perdue and the U.S. government.<sup>43</sup>

## The New [Old] Normal

Low commodity prices and declining farm incomes have some folks believing the ag economy has entered a "new normal." But Tina Barrett, executive director of Nebraska Farm Business

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<sup>43</sup> Rule, L. (2017). Lawsuit Challenges Cancellation of GIPSA Rule. Retrieved from <https://www.agweb.com/article/lawsuit-challenges-cancellation-of-gipsa-rule-apnews/>

Inc., says the current conditions are more like a return to the “old normal” of the late 1970s to the mid-2000s.

“The good times lasted long enough that we forgot the previous 20 years,” she says. “We’re witnessing new struggles for crop producers we haven’t seen in many years.”

The ag economy isn’t likely to improve next year, either, she says, and the impact of steadily rising property taxes weighs on the bottom line.

Barrett leads a farm business firm with 120 members who have a financial analysis conducted annually on their farms. Those operations, scattered across the state, vary in size and are predominately crop-based enterprises, although several have livestock. She says these client operations are fairly representative of most of the state’s cropping operations.

NFBI also has another 400 clients for whom either tax preparation, accounting or other financial services are provided.

Average net farm income for member crop operations (those with 70% of their gross income from crop sales) dropped almost 50%, from \$196,870 in 2013 to \$99,630 in 2014. Twenty-three percent of NFBI member farms actually saw negative farm incomes last year, and almost all of them were crop operations.

Numbers like this often lead non-farmers to think all farmers are getting rich and make considerably more than those living in town. But Barrett points out that items like principal payments on land and equipment, family living expenses and income and Social Security taxes are paid out of net farm income.

“The other thing to remember is that it takes a significant investment to farm,” she says. “It would be similar to having money invested in the stock market and expecting a 4 to 5% return. The net income last year is less than 5% of the amount invested in the farm which means that there was really no return to the average producer’s labor and equipment.”

Those members with income from both crops and cattle had net farm income rise in 2014 by 56%,” she adds. But with the recent downturn in the beef market, that scenario is doubtful when member farms are analyzed in 2015.

What’s important to note that in the period from 1996 to 2005, government payments were higher than net farm income in seven of those years. Government commodity program support is much less today.

## **Growing Debt**

Also, troubling is the rise in debt load among member farms. In 2014, average total debt rose to \$1,009,704, the first time the average climbed above \$1 million. That figure varied widely, with some borrowing little or nothing. Producers have a wide range of production costs and debt

load. “This includes not only inputs but a wide range of land costs from both cash rents or ground that is paid for,” she adds.

Barrett lists three scenarios that will likely cause problems:

- high-costs producers, including those locked into high cash rents,
- farmers who didn’t take the opportunity in recent years to pay down debt, and
- farms with high living expenses. “If you meet just one of these cases, you may still be OK, but if you fit two or three, it’s a problem.”

Impacts on local communities will occur or have already been felt, she says, because farmers won’t have the money to spend locally. Family living expenses need to be controlled, but Barrett says that’s an expense that is difficult to control.

Businesses tied to agriculture, locally and statewide, will ultimately be affected negatively, she adds.

The Nebraska economy will also be affected, in terms of lower sales and income tax receipts, which will have implications down the road.

Barrett says crop producers must figure cost of production and use those numbers to make changes in their operation. “Purchases for new equipment and precision technologies that were made four to five years ago may not make sense today. Production decisions need to be evaluated as to which seed to purchase and how much fertilizer to apply. While trimming expenses is important, be careful to avoid doing so with expenses that make you money,” she adds.<sup>44</sup>

## Fruit and Vegetable Production

Fruit and vegetable production have experienced steady growth in Nebraska. While some areas may be more productive than others, production can be found throughout the state to varying degrees. This includes standard vegetables, such as tomatoes and cucumbers, to melons, pumpkins, squash, onions, berries, sweet corn, and many other types of produce. This highly intensive enterprise requires specialized equipment, a large labor supply, and the knowledge to produce and market a profitable crop. Innovative, time honored methods such as high tunnels, mulches, cold frames, and row covers are becoming increasingly popular among growers who wish to extend their harvest seasons to increase farm profitability.

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<sup>44</sup> McCabe, D. (2018). Nebraska Farm Bureau. Retrieved from <https://www.nefb.org/component/content/article/98-latest-news/197-ag-s-golden-era-dimming-quickly>

Many fruit and vegetable farms diversify their marketing efforts by selling at farmers' markets; roadside stands, community supported agriculture (CSA), u-pick operations and/or through wholesale and/or retail outlets.

- The number of Nebraska produce growers has increased 700 percent over the past decade from 78 in 2000 to more than 600 in recent years.
- Nebraska has approximately 100 farmers' markets, 240 roadside stands, and 40 u-pick operations.<sup>45</sup>

## Golden Triangle

Nebraska is the second largest ethanol producing state in the nation. With approximately twenty-five operating ethanol plants utilizing the state's abundance of corn as the main feedstock, Nebraska produces more than 2 billion gallons of renewable fuel annually. Meanwhile, distillers' grains, a co-product of ethanol production, is important as both a domestic livestock feed ingredient and as a foreign export product. The linkage between corn, ethanol, and livestock production has become known as Nebraska's "Golden Triangle."<sup>46</sup>

Nebraska is the third-largest producer of corn in the country, second in ethanol production and distillers' grains (the feed ingredient produced by ethanol plants), second in cow-calf production and first in cattle on feed. It's also an important location for the production of renewable corn-based polymers.

This means corn farmers have solid markets for corn – ethanol, and livestock – while the two-dozen ethanol plants across state then provide renewable fuel *and* a feed ingredient for the livestock industry, giving cattle feeders in Nebraska more feed options and an advantage over feeders in other states. The cattle sector then provides high-quality, corn-fed beef to people across town, throughout the country, and around the world.

In essence, Nebraska's Golden Triangle is a perfect way to add value to corn – via a renewable biofuel, distillers' grains, and meat production – all within Nebraska's borders, providing an incredible economic engine for the state.

The significant economic impact of these sectors was analyzed by the University of Nebraska Department of Agricultural Economics.

<sup>45</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

<sup>46</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

When we transform Nebraska corn into ethanol, it doesn't disappear in the food supply. Ethanol is made from the starch of the kernel-the rest of the corn becomes livestock feed, corn oil, sweetener, and other food ingredients, like carbon dioxide.<sup>47</sup>

Distillers' grains are the major by-product from the production of ethanol. To produce biofuels, cereal grains are heated and fermented. The starch is converted into ethanol and removed. The mixture of concentrated protein, fiber, oil, and minerals, which remains is called stillage.

Stillage is sold either wet (20 to 30% dry matter) or dry (90% dry matter). Stillage remaining after the fermentation and distillation process is low in solids and is sometimes fed directly to livestock through the watering system (thin stillage).

Typically, stillage is further separated into distillers' grains and solubles. Solubles are recovered and incorporated into the distillers' grains, called distillers' grains with solubles (DGS). DGS can be used wet (WDGS) but is often dried (DDGS) in order to reduce shipping costs. There is considerable variation in the composition of distillers' grains. Composition may be partially reflected by whether grain is processed by dry or wet milling before it is fermented.

Because starch is almost completely removed in the process to distill ethanol, concentration of other components, except calcium, is enhanced significantly. For example, fat, protein, fiber, phosphorus and sulfur are roughly three times as concentrated in DDGS than in the original grain.<sup>48</sup>

## Grapes

Nebraska-grown grapes are produced into fine wines. Nebraska has more than 40 wineries and tasting rooms located across the state. Grape and wine production gained momentum in the 1990s and has continued to grow the past 20 years. Growers, winemakers, academia, government, distributors, and marketers work in cooperation to advance the interests of the Nebraska grape and wine industry through advocacy and education. Nebraska's fertile soils, topography, and humid continental and semiarid climates have been conducive to producing premium quality grapes that have resulted in award winning wines.

Nebraska grows many French-American hybrids and American varieties.

- Winter hardy grape varieties, among the reds, include Frontenac, Marechal Foch, and de Chaunac and, among the whites, Brianna, Edelweiss, LaCrosse, and Traminett.
- Nebraska has 611 acres of grapes and 550 vines per acre.

<sup>47</sup> Nebraska's Golden Triangle | . (2018). Retrieved from <http://nebraskacorn.gov/corn-production-uses/nebraskas-golden-triangle/>

<sup>48</sup> Distillers' Grains - Beef Cattle Research Council. (2018). Retrieved from <http://www.beefresearch.ca/research-topic.cfm/distillers-grains-4>

- More than 100,000 gallons of Nebraska wine are produced each year.<sup>49</sup>

Wine lovers in Nebraska can rest easy, knowing grape growers were back in the fields harvesting last week (August 2018).

At James Arthur Vineyards, workers were in the fields last Friday harvesting grapes for the winery's popular Edelweiss vintage.

According to the Nebraska Winery and Grape Growers Association, there are a few varieties that do best in Nebraska. Those include Edelweiss, LaCrosse, St. Croix and Vignoles.

Vineyard Manager Josh Rockemann said the year hasn't been too bad for growing grapes.

"It's been about an average, maybe a little bit better than average, year," Rockemann said. "Nothing to complain about."

The winery grows about a dozen varieties of grapes, Rockemann said. In the end, that can add up to 50 to 70 tons a year, depending on the year.

"That's a lot of buckets of grapes," Rockemann said.

The harvest started just about on time this year. Usually, harvests begin early August and go until September.

"It kind of depends on the weather we have," Rockemann said.

When the fields are ready, the Vineyard hopes to get as many workers as possible out among the vines to harvest the crop.

Rockemann likes to get at least 50 to 60 people at a time. Some years are easier than others to find people willing to work the harvest.

"It seems like the last few years; it's been a struggle," he said.

When the harvest starts after the first day of school, finding people can be tougher.

"Once school gets in, it's tough to get schedules going," Rockemann said.

Last Friday, Rockemann said he had plans for the Raymond Central football team and volleyball teams to come help out over the weekend. His wife, Andrea, coaches volleyball for Raymond Central.

Having groups sign up makes things a little smoother to manage.

"A big group of people with one phone call makes my life easier," Rockemann said.

The days begin at 6:30 a.m. and typically end by noon or 1 p.m. at the latest.

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<sup>49</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

“Before it gets hot, basically,” Rockemann said.

The work doesn’t happen every day, either. With different varieties of grapes ripening before others, the schedule can vary.

“Generally, once we get rolling, we’re picking one day a week, if not two or three,” Rockemann said.

The harvest workers use grape forks to cut the grapes from the vine, then throw them by the bunch into five-gallon buckets. Those buckets are then dumped into large bins.

The grapes are then crushed and pressed the same day to be put into tanks and chilled.

Other local vineyards are also getting into harvest mode. At Windcrest Winery, the grapes are “looking good,” according to a post on the winery’s Facebook page.

Deer Springs Winery, too, has reported that employees are getting ready for the harvest.

Though finding workers can be difficult for growers at the beginning of the season, it all usually comes together.

“It’s a little stressful to start off,” Rockemann said. “But it always works out in the end.”<sup>50</sup>

## Hay/Alfalfa

Hay is grown in every county in Nebraska and is a vital to the state’s success as a cattle-producing state. Grass hay is either grazed in the pasture or baled in a variety of round and square bales where it is fed overwinter or shipped around the country. Hay can be grown in parts of the state where other crops may be unprofitable or unsuitable for the soil, including the Sandhills region, which is rich with sub-irrigated meadows. In these meadows, the water table is very close to the surface, making it difficult to grow crops but allowing hay to have constant water throughout the growing season.

More than 6 million tons of hay and alfalfa were grown in Nebraska in 2014. Nebraska is the nation’s 6th largest producer of hay and alfalfa.

- Alfalfa is well known for its high protein content which is especially important for the nutrition of dairy cattle.
- Nebraska also produces dehydrated alfalfa pellets, which can be economically exported to other states and countries.

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<sup>50</sup> Wunder, M. (2018). Grape Harvest Underway. Retrieved from [https://www.wahoo-ashland-waverly.com/news/grape-harvest-underway/article\\_dd5fd698-a6e5-11e8-af44-2b6e903d176b.html](https://www.wahoo-ashland-waverly.com/news/grape-harvest-underway/article_dd5fd698-a6e5-11e8-af44-2b6e903d176b.html)

Alfalfa is a high-quality forage grown in Nebraska that differs from regular hay in several ways. Alfalfa has a reputation for having the highest nutritional quality and highest yields amongst all forage crops and is used extensively in beef and dairy operations. Alfalfa is typically baled, and several cuttings are possible each growing season. Alfalfa is a legume like soybeans, peas, and dry edible beans, which means it is capable of capturing nitrogen from the air and storing it in its root system. This allows alfalfa to act as a fertilizer, and it is commonly rotated with other crops like corn to keep soil productive and healthy.<sup>51</sup>

Alfalfa – raised by farmers for commercial forage production – is one of Nebraska’s top crops, with farmers harvesting a whopping 3.4 million tons in 2015.

Nebraska is a national leader in commercial alfalfa production, ranking No. 4 in the nation.

“Alfalfa is a huge product for Nebraska that doesn’t get a lot of news or attention,”

says Erik Peterson, who farms 1,000 acres of alfalfa, 800 acres of corn, and 200 acres of sugar beets near Gering with his dad, Greg, and brother, Davin. “It takes a lot of knowledge and equipment, but over time it has been our family’s most profitable crop. If you produce high-quality alfalfa, you’re rewarded because there’s always a market for it somewhere in the U.S.”

Alfalfa, which is a legume and rich in protein, is primarily produced as a food source for dairy and beef cattle. Farmers send samples of alfalfa they grow to labs to determine its quality, and that level of quality determines where it ends up.

“If it is really high-quality alfalfa, it’s sold to dairies because dairy cows require the high quality to maximize their milk production,” Peterson says. “The medium- or low-quality alfalfa goes to

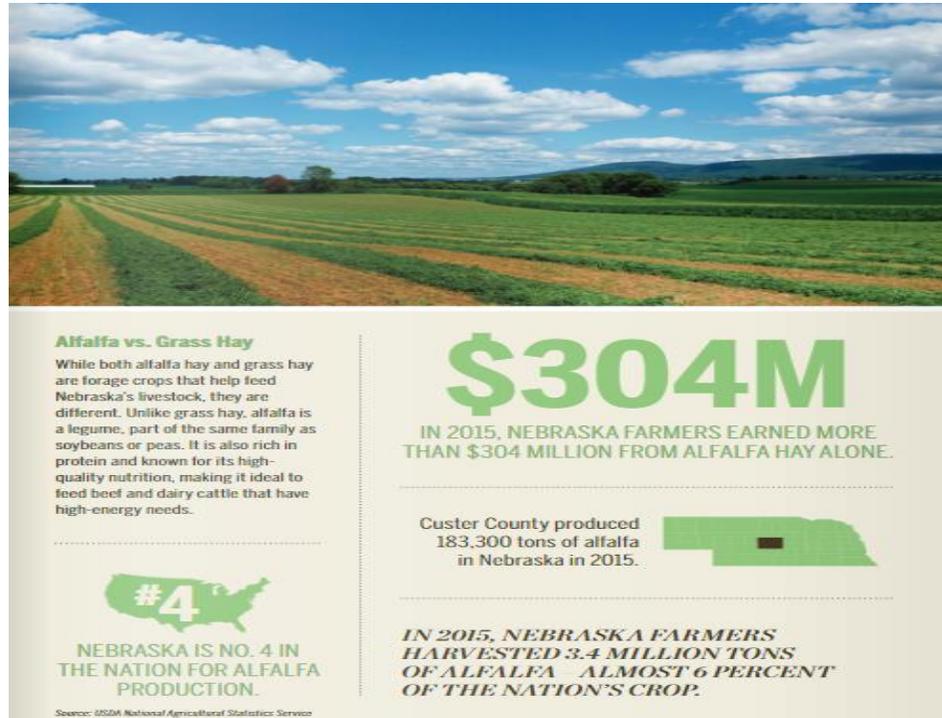


Image Source: <https://www.farmflavor.com/nebraska/nebraska-agriculture-2017/>

<sup>51</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

feedlots to be ground up and mixed with grains or corn to feed cattle according to the animals' dietary needs."

Farmers plant the perennial seed in spring or fall and need ample moisture in order to make sure the seed germinates. A classical rotation involves alternating a legume like alfalfa or clover with a crop like corn or wheat.

"We live in an arid climate, so our farm is all irrigated," Peterson says. "If you plant in spring, it takes 50 to 60 days to get the first cutting. We cut it right when it starts to form buds because that results in higher quality. During a normal season, we're cutting every 28 to 30 days, about three or four times per year through the summer. It smells really good when you're done cutting it."

The cut alfalfa is placed in windrows, or long lines of raked hay laid out to dry in the wind.

"We mow the standing crop and place it in a windrow. This is all one process," says Carl Simmons, an alfalfa producer near Valentine. "The windrows are allowed to dry to about 13 percent moisture or less. Then we wait until the dew comes on and the moisture rises to about 16 percent. If this happens, we bale the hay. It's not a science that can be predicted – there are many variables."

The moisture content is critical because too much moisture could cause the hay bales to spoil. Peterson says they can usually bale the hay within four to seven days if the weather is nice.

"We bale it into 3-by-4-by-8-foot square bales that are designed to ship on flat-bed trailers to feedlots or dairies. The bales weigh 1,500 pounds apiece," he says. "If we plan to store them, we stack them in hay sheds or tarp them."

Some of Nebraska's alfalfa hay stays in state, while a large portion is exported.

"The typical market for square bales going outside Nebraska is from the Rocky Mountains east," says Barb Kinnan, executive director of the [Nebraska Alfalfa Marketing Association](#). "We have had producers ship hay to most every state east of that line, including Maine and Florida and every state in between."

Colorado has been a profitable market for Nebraska's alfalfa producers in recent years, thanks to a tremendous growth in the number of dairies there.

"Colorado has a huge cheese plant in Greeley that makes mozzarella cheese for national pizza chains, for example," Peterson says.

Cows fed high-protein Nebraska alfalfa are producing some of the milk used to make the cheese.

Not every bale of hay you see along a Nebraska country road is made of alfalfa. Farmers also produce grass and meadow hay, and Nebraska ranks No. 7 nationwide in the “Other Hay” category.

“You can usually tell by the shape of the bale what type of hay it is,” Peterson says. “Round bales are mostly grass hay for local markets. The large square bales are more for commercial alfalfa operations like ours because they’re easier to ship on trucks.”<sup>52</sup>

## Hogs

Nebraska’s pork industry plays an important role in the state’s agricultural economy. Pig farms vary in size and how the pig is raised. In Nebraska, there are more than 3.1 million pigs. Advances in animal genetics, technology, and management practices have changed, leading to leaner and more nutritious pork. Six of the most common cuts of pork have, on average, 16 percent less fat and 27 percent less saturated fat than 20 years ago.

- Nebraska’s pork industry generates more than \$1 billion in annual cash receipts.
- Pork is consumed by more people worldwide than any other meat.
- Nebraska has the 6th largest swine herd in the country.<sup>53</sup>

Nebraska’s Sept. 1 inventory of hogs and pigs was at 3.45 million head, according to the U.S. Department of Agriculture’s National Agricultural Statistics Service, which was unchanged from Sept. 1, 2017, but down one percent from June.

The breeding hog inventory of 430,000 head was up 5 percent from a year ago, but unchanged from the last quarter, while the market hog inventory of 3.02 million head was down 1 percent from last year and down 2 percent from the last quarter.

The June-August Nebraska pig crop of 2.09 million head was down 6 percent from the same period in 2017 and the average pigs saved per litter, 11.3, compares to 11.65 a year ago.

Nebraska hog producers intend to farrow 190,000 sows during the September-November 2018 quarter, which would be down 3 percent from actual numbers a year ago.

Intended December 2018-February 2019 farrowings of 190,000 sows would be up 6 percent from actual farrowings during the same period a year ago.<sup>54</sup>

<sup>52</sup> Mozo, J. (2017). How Alfalfa Hay Plays an Important Role in Nebraska Agriculture. Retrieved from <https://www.farmflavor.com/nebraska/how-alfalfa-hay-plays-an-important-role-in-nebraska-agriculture/>

<sup>53</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

<sup>54</sup> USDA Reports Hog and Pig Inventory. (2017). Retrieved from [https://www. Kearneyhub.com/news/agriculture/usda-reports-hog-pig-inventory-in-nebraska/article\\_72fa1ea2-c8ce-11e8-91d6-b357982084bd.html](https://www. Kearneyhub.com/news/agriculture/usda-reports-hog-pig-inventory-in-nebraska/article_72fa1ea2-c8ce-11e8-91d6-b357982084bd.html)

## Pork Processing is Picking Up Speed

The USDA released a proposed rule in January of 2018 to lift caps on line speeds in meat processing plants, granting individual facilities the power to determine how quickly [pork](#) can be processed on site.

Currently, pork plants process an average of between 950 and 1,000 hogs per hour; new line speeds could reach an estimated 1,295 hogs per hour, according to test processing facilities in operation since 1997.

While the New Swine Slaughter Inspection System was developed based on data from these test plants, a 2013 audit by the USDA's Office of the Inspector General found that the USDA "did not provide adequate oversight" of the program, noting that as a result, there was a "higher potential for food safety risks" associated with them.

The new rule would also reduce federal oversight in these meat processing plants: establishment personnel would be responsible for sorting and removing unfit animals and identifying defects before FSIS inspection. FSIS online inspectors would be reduced to a maximum of three per line per shift.

Worker safety experts reacted to the proposed rule, noting that it would add to the already high risk of food contamination and worker injuries in meat processing plants. Meatpacking workers already experience a risk of injury seventeen times higher than that of other workers nationwide, with high instances of carpal tunnel, tendonitis, and amputations.

"Workers who bring food to our tables deserve safety and dignity on the job, and consumers deserve and demand safe food," said Jessica Martinez, co-executive director of National Council for Occupational Safety and Health. "Raising line speeds in pork processing plants will only make a bad situation worse."

"It's moving in the wrong direction," Center for Food Safety Senior Policy Advisor Jaydee Hanson told [Reuters](#). "A lot of the big companies want to get USDA inspectors off the line so that they can run it faster."

FSIS, however, alleges that the new system will result in a lower prevalence of salmonella, thus reducing foodborne illnesses linked with pork.

"In addition," FSIS said, "the new system should improve animal welfare and compliance with the Humane Methods of Slaughter Act (HMSA) because more FSIS resources will be available to verify humane handling as an offline activity."

The proposed rule will be subject to a 60-day comment period once it is published in the Federal Register.

A similar rule has recently been suggested for [poultry plants](#) after a petition by the National Chicken Council called line speed caps “arbitrary” and alleged that they hindered the development of the industry. Workers rights groups expressed the same worries with regards to this proposed change.

“There’s no data to support that this would be safe,” Debbie Berkowitz, a senior fellow at the National Employment Law Project, a research and advocacy group in Washington, told [NBC](#) of the proposed change. “Even at existing line speeds, it’s extremely unsafe.”<sup>55</sup>

## Bred to the Limit

Death rates for female pigs in the US are rising fast, sending alarm bells ringing throughout the farming industry.

The mortality rate rose from [5.8% to 10.2%](#) on farms owning more than 125 sows between 2013-2016, according to one organization that collects data across 800 companies.

The numbers have been linked to a troubling rise in prolapse – the collapse of the animal’s rectum, vagina, or uterus. In some cases, the prolapse itself is fatal. In others, the pig is euthanized as a result. Some farms have seen no rise or much smaller rises, but a separate report last year found that some farms were seeing prolapse causing [as many as 25%-50%](#) of sow deaths.

The American Association of Swine Veterinarians has created a sow prolapse working group, but their findings so far have been inconclusive. In April, the National Pork Board announced a [multi-year research collaboration](#) with Iowa State University’s Iowa Pork Industry Center designed to get a broad overview of the problem. Iowa is the nation’s top pork producer. The study, which is still under way, aims to collect detailed data from 400,000 sows – or about 13% of the nation’s 3 million working sows – on more than 100 farms across 16 states.

A number of possible causes have been suggested, including vitamin deficiency, mycotoxins in the feed, high density diets or abdominal issues. Some experts blame confinement systems in intensive farming – sows will spend a large percentage of their lives in gestation and farrowing crates that don’t allow them to move around. Modern breeding practices have also been suggested as a causal factor.

Industry figures largely declined to comment, but some acknowledged that they are grappling with the issue. “It’s a topic in our meetings, both in the hallways and the meeting spaces,” said Dr. Tom Burkgren, executive director of American Association of Swine Veterinarians, a group that educates vets around the country.

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<sup>55</sup> Monaco, E. (2018). USDA Proposes Lifting Meat Processing Line Speed Caps in Pork Plants. Retrieved from <https://www.organicauthority.com/buzz-news/pigs-will-fly-usda-proposes-lifting-meat-processing-line-speed-caps-in-pork-plants>

An estimated 97% of the US's [73 million hogs](#) are raised in closed barns or confined feeding operations. In these systems sows often live the majority of their lives in gestation or farrowing crates that don't allow them to get up or turn around. In this system, the average sow produces [23.5 piglets per year](#) – or ten per litter at a rate of 2.35 litters annually. After two to four litters, most sows tend to be replaced by younger gilts who can produce piglets at a higher rate.

Mary Temple Grandin – professor of animal science at Colorado State University and consultant on the design of livestock-handling facilities – told the Guardian that highly focused breeding across the industry has led to unintended consequences. She said that one side effect of selecting for animals that are more fecund is an increased tendency toward lameness.

In the late 1980s, Grandin added, pigs were bred with three traits in mind: rapid weight gain, thin back fat, and a big loin. Now, she added, “They’re breeding the sows to produce a lot of babies. Well, there’s a point where you’ve gone too far.”

“We’ve bred a contradiction into these animals,” says Leah Garces, outgoing executive director of the US branch of Compassion in World [Farming](#). “Over the last few decades, sows to have been bred to have less back-fat – because people don’t want to eat as much fat – but we also want them to produce more and more babies. And that’s not biologically possible; their bones are weak, and they don’t have enough fat to support the reproductive process. We’ve bred them to their limit, and the animals are telling us that.”

## Finding the Balance

The high incidence of animal loss in confinement systems is one of the main reasons that Paul Willis, co-founder of Niman Ranch (now a subsidiary of Perdue Farms) spent years building an alternative to modern hog farming. “I have a neighbor that has been raising pigs [in a confinement system] ... and they have a dumpster, and I can go by there almost any time of the day or week, and it’s full of dead hogs,” said Willis.

When he was raising hogs at a smaller scale, perhaps 200 to 300 at a time, and allowing them to spend time outside, engaging in behaviors that are typical for hogs, such as wallowing and building nests out of straw, Willis said he’d lose just “a few animals a year.” Under this system, pigs only produce about half as many offspring a year as they do in industrial systems.

The key in most livestock production is finding a balance between productivity and the health of the animals, said Grandin. “You have to figure out the optimal number of piglets these sows should have. One thing people have trouble with is asking what is optimal – not maximal, but optimal – when it comes to breeding.”<sup>56</sup>

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<sup>56</sup> Greenaway, T. (2018). 'We've bred them to their limit': death rates surge for female pigs in the US. Retrieved from <https://www.theguardian.com/environment/2018/oct/01/death-rates-surge-female-pigs-us>

## Tariffs vs. Growing Production

Retaliatory tariffs from China have targeted pork and soybeans, among a host of other goods. The U.S. exports about 23 percent of its production. And that pork production has been growing. In 2018, pork production is expected to experience almost 4 percent year-over-year growth. Hog prices are expected to show about a 9 percent decline in the fourth quarter alone.

In the face of growing production, export growth becomes key to sustaining prices. Net pork exports this year has totaled about 2.1 billion pounds, about a 200-million-pound improvement from 2017. But, the tariffs have begun to cut into pork exports already. Exports to China and Hong Kong are down about 40 percent. Fortunately, other markets have taken up the slack, but at lower prices.

If reduced exports have to stay in our domestic market, then that increase in meat supplies will result in lower pork prices and lower beef prices as these industries compete for retail sales.<sup>57</sup>

At one of the sessions at the World Pork Expo in 2016 in Des Moines, veteran pork industry analyst Steve Meyer looked into the future regarding expansion of U.S. pork production to satisfy export needs, especially if Congress approves the proposed Trans Pacific Partnership trade agreement. Expanded pork production means increased hog processing capacity will be needed in the United States.

Three large pork processing plants are being built in the Midwest and will come online over the next two years. The new facilities could push older plants in Iowa and Nebraska to close down, says Meyer, an economist with EMI Analytics, a consulting company based at Ft. Wayne, Indiana.

Meyer thinks some of the large, older single-shift hog processing plants in the Midwest will be hard-pressed to compete with the new state-of-the-art plants. The three Iowa plants at risk of closing are at Perry, Columbus Junction, and Denison. Three plants in Nebraska at Crete, Madison and Fremont are also likely to eventually close.

“Typically, those older plants have higher costs of operation, and several of them are in Iowa,” notes Meyer. “They will be under some pressure, no question.”

However, in a written statement, Caroline Ahn, manager of public relations for Tyson Foods, said the company is committed to keeping its plants open.

“We have no intention of closing any of our pork plants, including those in Madison, Nebraska; Perry, Iowa, and Louisa County (Columbus Junction), Iowa,” Ahn said. “We have a strong

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<sup>57</sup> Martinez, C., & Anderson, D. (2018). How the new tariffs affect the beef industry → Southern Livestock Standard - The definitive news and information source for the beef cattle segment of the livestock industry. Retrieved from [http://www.southernlivestock.com/articles/marketing/how\\_the\\_new\\_tariffs\\_affect\\_the\\_beef\\_industry-13242-sls](http://www.southernlivestock.com/articles/marketing/how_the_new_tariffs_affect_the_beef_industry-13242-sls)

presence in the communities we operate in and are continually reinvesting in our plants to keep them operating competitively and efficiently.”

Headquartered in North Carolina, Prestage Farms officials say their company is still considering locating a new \$240 million hog processing facility in Iowa. Prestage has been contacted by about 20 Iowa communities interested in being home to the project and its estimated 2,000 jobs. Ron Prestage, a leader of the family-owned company, says the company wants to select a site soon so construction can get underway and the plant can open in 2018.

Iowa State University economist Dermot Hayes says Iowa pork processing plants could have a competitive advantage over pork processing operations in other Midwest states. Iowa is located in the middle of the nation, has a large supply of hogs, has cropland that can use the manure, and Iowa produces plenty of corn to feed hogs.

There are some small hog processing plants in the Upper Midwest—in Indiana, Ohio, Nebraska that might be in bigger trouble, says Hayes, than the larger ones in Nebraska and Iowa. Iowa is the nation’s largest pork producer, with about 21 million pigs raised annually. Iowa is also the leading corn producing state, having grown 2.5 billion bushels in 2015. The Perry and Columbus Junction hog processing plants in Iowa are owned by Tyson, and the Denison plant is owned by Smithfield Farmland.

Meyer says pork processing capacity is expected to be extremely tight this fall. That will put downward pressure on hog prices as delays in processing cause animals to be held to heavier weights and overall pork supplies to get larger. He believes processors will be working at capacity for a month or more. Eventually, however, when the new plants come online, Meyer says pork producers in Iowa and elsewhere will be hard-pressed to keep pace with processing growth over the next few years.<sup>58</sup>

## **Rising Tension. Falling Profits.**

Ken Maschhoff, chairman of the largest U.S. family-owned pork producer, has watched profits fall as trade tensions rise between the United States and China.

His company, The Maschhoffs, has halted U.S. projects worth up to \$30 million and may move some operations overseas. Investing in domestic operations now would be “ludicrous” as China and others retaliate against U.S. agricultural goods, Maschhoff said from the firm’s Carlyle, Illinois headquarters.

Across the globe, Chinese pig farmer Xie Yingqiang sent most of his 1,000-pig herd to slaughter in May to limit losses after Chinese tariffs on U.S. soybeans hiked feed prices and left him unable to cover his costs.

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<sup>58</sup> Swoboda, R. (2016). 3 large pork processing plants coming online in Midwest in next 2 years. Retrieved from <https://www.wallacesfarmer.com/story-3-large-pork-processing-plants-coming-online-midwest-next-2-years-25-142635>

“It did not really make sense to keep raising them,” said Xie, from eastern Jiangsu province.

The dueling salvos of the U.S.-China trade war are landing particularly hard on the pork industries of both nations – and spraying shrapnel that has damaged other major pork exporters such as Brazil, Canada, and top European producers. In contrast to many industries that trade war has divided into winners and losers, the world’s pork farmers and processors are almost universally shedding profits and jobs from a crippling combination of rising feed costs and sinking pig prices.

The key reason: The trade war came at precisely the wrong time, after a worldwide expansion to record pork production levels on the expectation of rising meat demand and low feed prices from a global grains glut.

In the United States, meat companies such as Seaboard Triumph Foods ([SEB.A](#)) and Prestage Farms have spent hundreds of millions of dollars boosting U.S. slaughter capacity by more than 10 percent from three years ago to nearly half a million hogs daily.

Just before trade barriers went up, the U.S. Department of Agriculture (USDA) predicted in an April analysis that global supply growth would outpace demand this year, sparking “fierce competition and lower prices.” Tariff battles accelerated those trends by shutting off export markets, raising feed prices and upending regional supply-and-demand dynamics that underpinned industry profits.

“As this trade war has heated up, it’s made the trade with China very difficult - to even stopping at various points - because the tariff that’s been imposed makes it not viable,” Kenneth Sullivan, chief executive of Smithfield Foods [SFII.UL], the world’s largest pork producer and a division of China’s WH Group ([0288.HK](#)), told Reuters in an interview Friday.

“We’re keenly interested in the U.S. and China getting it resolved,” Sullivan said, adding that expansion of the U.S. pork industry had also hurt profitability. “Certainly U.S. agriculture has a lot at stake, and China, to the extent that they’re on the surplus end of the deficit, has you can argue more at stake.”

U.S. pork faces retaliatory duties of 62 percent in China and up to 20 percent in Mexico, slashing demand from two top U.S. pork export markets and contributing to a mountain of unsold meat in cold storage.

The White House did not respond to requests for comment.

The USDA said in a statement that pork producers soymeal costs have declined because of a surplus of domestic soybeans that China is no longer buying. The Trump administration is working to increase opportunities for U.S. agriculture with the European Union, Japan, and the United Kingdom, the agency said.

In China, tariffs on U.S. soybeans and an outbreak of African swine flu have driven farmers to send hogs for an early slaughter, exacerbating a glut that followed the rapid expansion of more efficient, large-scale farms in recent years.

Higher domestic supply and rising imports from other suppliers, such as Spain and Brazil, has compensated for the slide in U.S. pork imports. But an African swine fever outbreak this year has added to the problems of China's pork producers. More than 40 cases have been reported in 13 provinces so far, and restrictions on hog transportation to control the disease have resulted in a glut in some northern provinces and a shortage in the south.

Brazil's pork industry has suffered higher feed prices partly because farmers now must compete with major Chinese soybean buyers who turned to Brazil to avoid tariffs on U.S. beans.

Many farmers in China are searching for cheaper protein-rich ingredients to replace soymeal, such as rapeseed or yellow peas.

"Everything I use is becoming more expensive," said Yu Shiqian, who raises 1,800 hogs in northeastern Liaoning province. "Only the hog price is declining."

Big producers are also being hit hard.

Hong Kong-based WH Group ([0288.HK](#)), the world's top pork producer, which also owns U.S. giant Smithfield, warned earlier this year that its biggest challenge is the oversupply of meat in the United States and uncertainty over trade tensions.

Top Chinese producers Muyuan Foods Co Ltd ([002714.SZ](#)), Guangdong Wens Foodstuff Group Co Ltd ([300498.SZ](#)) and Beijing Dabeinong Technology ([002385.SZ](#)), reported their worst earnings in years in the second quarter due to weak hog prices. Dabeinong also blamed high raw material prices for eroding margins in its feed business.

Xie had hoped to rebuild his herd after the summer but instead "decided to stay away from the pig business for a while."

"At least I can guarantee I don't lose money this way," he said.

## **A 'RED YEAR'**

In Iowa, the top U.S. pork-producing state, trade disputes will cause hog farmers to lose \$18 per head, or \$800 million in total revenue from August 2018 to July 2019, Iowa State University economists predicted in September.

For the Maschhoffs, the estimated loss equates to \$100 million.

"We were going to make money in '18 and '19, and now we're going to have a red year," Maschhoff said.

The company considered investing in China, Eastern Europe, and South America in recent years but shelved the plans because they could more efficiently raise pigs in the United States.

“We’re starting to scratch our heads and say, ‘Did we make the right decision?’” he said.

Producers have scaled back expansion plans because of the trade war, said Barry Kerkaert, a vice president at Minnesota-based Pipestone System, which annually sells farmers about 250,000 sows.

In Lone Rock, Iowa, a town of about 200 people, Roger Cherland raises 3,000 sows. Housed in long barns, the swine jostle for space next to feed bins topped off by machines. The Cherlands’ hogs fetched about \$40 per hundred pounds in August - about \$20 less than their break-even price.

“We’ve got way too many pigs right now,” Cherland said of U.S. farmers.

In Europe, big pork exporters such as Spain and Germany, have made some additional sales to China and Mexico since the trade wars escalated this year. But the new sales have not been enough to support EU prices because of expanded domestic supply and because China bought less pork earlier this year than in past years.

Pig farmers in Brazil, the world’s fourth largest producer and exporter, also might have been well-positioned to capitalize on a U.S.-China trade war by boosting sales to China. But that has hardly offset the damage from higher feed prices and a host of domestic problems that are hurting exports, driving up domestic supply and slashing prices.

Russia, which until recently bought nearly 40 percent of Brazilian pork exports, imposed a ban in December after discovering traces of the prohibited food additive ractopamine. And the European Union banned imports from 20 Brazilian meat plants, mainly poultry suppliers, due to alleged deficiencies in the nation’s health inspection system.

Brazil’s pig farmers normally can buy cheap local soybeans, a key ingredient in animal feed, because the nation is the world’s second-largest soy producer - but now they pay record prices in part because of the rush of Chinese buyers.

Wilant Boogaard, a hog farmer in Paraná, operates as a member of a cooperative, a scheme that guarantees his production costs are covered by an associated meat processor.

But as partners in the processing business, the cooperative’s farmers have a 40 percent stake, leaving them on the hook for losses.

“The meat-packer is losing money,” he said. “If we manage to survive, it will be a great thing.”<sup>59</sup>

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<sup>59</sup> Polansek, T., Gu, H., & Mano, A. (2018). Hog industry worldwide getting slaughtered in trade war. Retrieved from <https://www.reuters.com/article/us-usa-trade-china-hogs-insight/hog-industry-worldwide-getting-slaughtered-in-trade-war-idUSKCN1N01HB>

## Hormel to Wholestone

Hormel Foods entered into a definitive agreement to sell the company's pork processing plant in Fremont, Nebraska, to Brandon, South Dakota-based WholeStone Farms LLC, a group of more than 220 independent pig farmers.

The transaction includes a pork processing plant and a multi-year agreement to supply pork raw materials to Hormel. The transaction is expected to close in December pending customary closing conditions. Financial details of the transaction were not disclosed.

"The Fremont facility has been an important part of our company for decades, and we are certainly pleased to have found a home for this team and facility with WholeStone Farms," said Jim Snee, chairman of the board, president and CEO at Hormel Foods. "The strategic decision to transition the Fremont facility to WholeStone Farms reflects the long-term, changing dynamics in the pork industry, and most importantly, is aligned with our vision as a global branded food company."

The independent farmers of WholeStone Farms raise 12 million pigs a year and farm nearly 400,000 acres of cropland. Dr. Luke Minion, chairman of the board of directors of WholeStone Farms, said additional investments in the plant will be made in the future.

"The purchase of the Fremont, Nebraska, processing facility from Hormel Foods aligns with our vision to create and capture value in the pork supply chain for the 220 independent producers who own WholeStone Farms," said Dr. Luke Minion, chairman of the board of directors of WholeStone Farms. "We value the dedication and experience the existing team brings to WholeStone Farms and are committed to significant additional investments in the facility for production efficiencies and enhancing employee wellness."

The current plant management team at the Fremont plant and the employees will remain in place to maintain continuity for customers.

"We look forward to working with WholeStone Farms to ensure a smooth transition for our employees, suppliers, and customers," said Glenn Leitch, executive vice president of supply chain at Hormel Foods. "A multiyear supply agreement with WholeStone Farms ensures the Fremont facility will continue as an integral part of our supply chain in the future. Our focus continues to be on ensuring a stronger supply chain from procurement to shipment of products, fully optimizing our system to create an efficient, enterprise-wide structure to keep pace with the growing needs of our business."<sup>60</sup>

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<sup>60</sup> Shaffer, E. (2018). Hormel offloads Nebraska processing plant. Retrieved from <https://www.meatpoultry.com/articles/19998-hormel-offloads-nebraska-processing-plant>

## Smithfield Farmland

Global packaged meats company Smithfield Foods is the largest pork producer and processor in the U.S. Tucked away just outside of the small town of Crete is [Smithfield's Farmland](#) processing facility, which employs 2,200 people – around one-third of the city's population. The plant makes fresh pork products, like marinated pork, as well as smoked hams and ready-to-cook bacon that are popular in grocery stores in Nebraska and beyond. Farmland is one of Smithfield's 13 core brands.

Facility employees handle products all the way from initial harvest to the final processing stages. According to Danielle O'Neel, the Crete Smithfield Farmland assistant human resources manager, the plant processes hogs to produce enough meat to feed approximately 30 to 40 million people across the world each week.

In order to handle such volume both safely and efficiently, the facility exercises a variety of quality control measures. O'Neel says U.S. Department of Agriculture employees are present on a daily basis to ensure Smithfield is following the proper food safety protocol.

"Our top focus is safety, and that goes for both our employees and our products," O'Neel says. "We're also really committed to animal care. Ultimately, we want to create the best-quality food we can in the safest environment possible."

## Cargill Meat Solutions

Another major employer in Nebraska, also located in the eastern part of the state, is the Cargill Meat Solutions plant in Schuyler, a beef processing facility that employs approximately 2,000 people.

According to Jarrod Gillig, the plant's general manager, the Schuyler location manufactures fresh-boxed beef, frozen-boxed beef, ground beef, beef trimmings, finely textured beef and more, including products like Certified Angus Beef and Sterling Silver Premium meats.

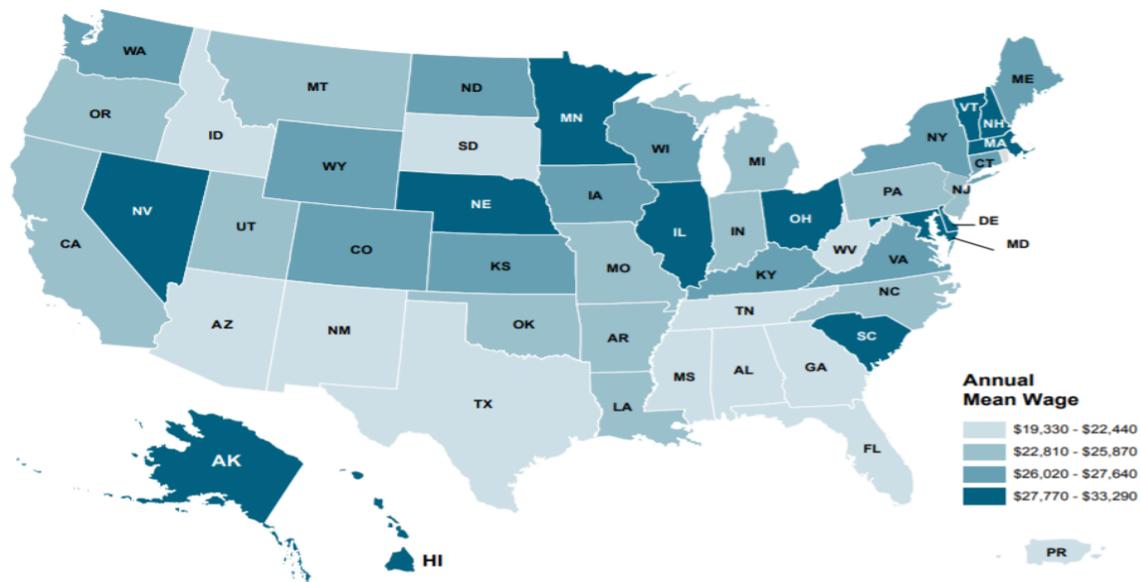
The facility uses an automated camera assessment system for grading, with more than 75 percent of its products graded [USDA Choice or Prime](#), the top two grades that meat can receive. The plant's high volume and diverse range of products requires it to employ leading-edge technology to meet USDA food safety requirements.

Furthermore, employees must complete monthly food safety trainings, and they are closely monitored – particularly in the "Video War Room." Gillig says the room received its name because "it's where we can look at all the action as it happens real-time on four monitor

screens.” If a video auditor notices a deviation from protocol, Gillig and the harvest manager are notified, and action is taken within five minutes of the occurrence.<sup>61</sup>

## Labor

**Annual Mean Wage of Farmworkers and Laborers, Crop, Nursery and Greenhouse, May 2016**



Source [https://www.dol.nebraska.gov/webdocs/Resources/Trends/March%202018/Trends\\_March2018\\_FINAL.pdf](https://www.dol.nebraska.gov/webdocs/Resources/Trends/March%202018/Trends_March2018_FINAL.pdf)

Farmworkers and laborers manually plant, cultivate, and harvest fruits, nuts, vegetables, and field crops. They may also clean, grade, pack, and load harvested products, repair fences, and farm buildings, or participate in irrigation activities. Common industries employing those in this occupation include support activities for crop production, miscellaneous nondurable goods merchant wholesalers, and lawn and garden equipment and supplies stores.

There were an estimated 273,450 workers employed in this occupation in May of 2016 across the country, with an estimated 800 employed in Nebraska. The average hourly wage nationwide was \$11.45. The average annual wage is calculated by multiplying the average hourly wage by 2,080 hours. Nationwide, the average annual wage for this occupation was \$23,820. The map above displays the average annual wage for this occupation by state in May of 2016.

In May of 2016, Nebraska was the top paying state in the country for this occupation, with an annual mean wage of \$33,290—nearly \$10,000 more than the national average. Other top-paying states in this occupation included Illinois, Nevada, Alaska, and Delaware, with annual

<sup>61</sup> Walker Boehm, J. (2017). Bacon, Ham, Beef: Welcome to Meat Processing Country. Retrieved from <https://www.farmflavor.com/nebraska/bacon-ham-beef-welcome-meat-country/>

wages ranging from \$29,340- \$30,930. Grand Island, Neb. had the second highest annual mean wage for a metropolitan area at \$41,480 (this represents an hourly wage of \$19.94). There were an estimated 150 workers in this occupation in the Grand Island area in May of 2016. More information on this occupation is available on the Bureau of Labor Statistics website.<sup>62</sup>

## Labor Shortage Hamstringing the Industry

The two “Ps” of the meat industry – poultry and pork – face many of the same challenges in today’s market as consumption of both proteins continues to grow and expected production increases have analysts weighing the impact and possible outcomes. During a June 4 presentation at the Sosland Purchasing Seminar, Christine McCracken, an executive director at Rabobank focusing on animal protein, discussed how both segments face headwinds when it comes to labor shortages at processing plants now and in the foreseeable future, but issues such as the impact of retaliatory tariffs on exports and trade conflicts are bigger hurdles for pork than for poultry.

McCracken pointed out that employee turnover at slaughtering facilities has doubled in the past two years, peaking at 220,000 workers this past February. She anecdotally mentioned recent reports where 50 percent of line workers walked off the processing line on a Friday afternoon to express their discontentment, even after wage increases of up to 20 percent were implemented.

I expect this to be the No. 1 issue that comes into play over the next year,” she said of the labor shortage. McCracken said in some cases, the shortage has resulted in some packers being unable to have raw product deboned and many are considering exporting product to be deboned and then shipped back to the US, which would create logistical hurdles processors want to avoid.

She said at least two of the newest pork plants have announced plans to add second production shifts to keep up with production demands but going to the additional shift has been delayed because of a lack of applicants needed to fill hundreds of positions. This, she said is “a massive issue for the industry because those pigs are already on the ground.”

Part of the labor shortage is based on the fact that many new and existing processing plants are clustered together in the same geographic region, specifically, Seaboard Triumph Foods (Sioux City, Iowa), Prestage Farms (Wright County, Iowa) as well as Tyson Foods’ massive beef plant in Dakota City, Nebraska and its poultry plant in Council Bluffs, Iowa. This creates an opportunity for workers to shop for a position that best suits their needs.

Meanwhile, the push for more product is unrelenting, and the pork industry especially is being challenged by the addition of four new processing plants that are already online and a fifth

<sup>62</sup> <https://www.ijltet.org/journal/151728819812%202051.pdf>. (2018). *International Journal of Latest Trends in Engineering and Technology*, 9(3). doi: 10.21172/1.93.12

(Prestage Farms) expected to be added within a year. “That’s adding about 10 percent incremental capacity,” McCracken said, a substantial production increase in a relatively short amount of time. The aggressive ramp-up would put a significant strain on the market not only from a supply standpoint but also as it relates to the labor shortage already hamstringing the industry.<sup>63</sup>

## A Lot on the Line

As unions warn of serious injuries, plans to take speed limits off the lines at pig plants are causing anxiety.

Amputations, fractured fingers, second-degree burns, and head trauma are just some of the serious injuries suffered by US meat plant workers every week, according to data seen by the Guardian and the [Bureau of Investigative Journalism](#).

US meat workers are already [three times more likely](#) to suffer serious injury than the average American worker, and pork and beef workers nearly [seven times more likely](#) to suffer repetitive strain injuries. And some fear that plans to remove [speed restrictions on pig processing](#) lines – currently being debated by the government – will only make the work more difficult.

Government and industry bodies point out that there have been reductions in worker injury rates over the last couple of decades, although the figures still remain higher than average. They [argue](#) that despite the lifting of speed restrictions, the need to adhere to strict rules on food safety will impose its own limit on line speeds.

Records compiled by the Occupational Safety and Health Administration (OSHA) reveal that, on average, there are at least 17 “severe” incidents a month in US meat plants. These injuries are classified as those involving “hospitalizations, amputations or loss of an eye.”

Amputations happen on average twice a week, according to the data. There were 270 incidents in a 31-month period spanning 2015 to 2017, according to the OSHA figures. Most of the incidents involved the amputation of fingers or fingertips, but there were recordings of lost hands, arms or toes. During the period there were a total of 550 serious injuries which cover 22 of the 50 states so the true total for the USA would be substantially higher.

Recorded injuries include:

- An employee’s left arm had to be surgically amputated at the shoulder after it was pulled into the cubing machine during sanitation.

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<sup>63</sup> Crews, J. (2018). Pork, poultry industries face supply and labor challenges. Retrieved from <https://www.meatpoultry.com/articles/19603-pork-poultry-industries-face-supply-and-labor-challenges>

- A worker was reaching down to pick up a box to clear a jam when his jacket became caught in a roller. As he tried to pull it out, his hand got pulled in as well. His hand and lower arm were crushed.
- While an employee was attempting to remove the ribs from the spine of a cattle rib set, his hand contacted a running vertical band saw, and two of his fingers were amputated.
- An employee working on a sanitation crew pushed the stop button after removing parts from the upper portion of a machine. The employee then placed his foot into a horizontal grinder while climbing down from the machine, causing all five toes on his right foot to be amputated.
- A worker was clearing the hydrolyzer when back pressure caused hot feathers to discharge on to him. As he moved out of the way, he fell six feet, breaking a bone over his left eye and suffering first- and second-degree burns to the hands, arms, face, and neck.

Chronic ailments are an even bigger issue, leaving many workers permanently disabled, and leading to losses and costs, both individually and publicly. According to one published study, carpal tunnel syndrome [costs more than \\$2bn annually](#) in medical treatment costs alone, for workers in all US industries.

“Every co-worker I know has been injured at some point,” plant worker Eric Fuerstenberg told the USDA as they examined the case for implementing reforms that would include speeding up the line. “I can attest that the line speeds are already too fast to keep up with. Please, I am asking you not to increase them anymore.”

A meat plant worker who asked to remain anonymous told the Guardian that although he has managed to avoid injury himself, most of his friends have needed surgery at some point. “If you complain about your hands, they just say you’ll be fine ... they want you to put ice on it during your break time or lunchtime” – rather than during production hours.

The 50-year-old worker, from Nebraska, adds, “When I get home I have to stretch my hands, I feel a pinch, it hurts... You never get used to the work. I do it because I have to support my family. I don’t have an education.”

Amanda Hitt, from the [Food Integrity Campaign](#), said: “Increased line speeds pose a real threat to workers. In addition to heinous injuries resulting from speed such as amputations and physical injury, workers are also at risk from injuries resulting from repeated motions. A pork plant worker may make ... hard-cutting knife motions while working on a line. This repetition puts the worker at risk [of] debilitating musculoskeletal problems.”

However, official injury rates in the sector have been reduced over the last 25 years after an industry and government push to improve training and guidelines. “Worker safety is considered a non-competitive issue in the meat and poultry industry,” said Eric Mittenthal, spokesman for

the North American Meat Institute (NAMI), “meaning companies openly share best practices with each other at meetings throughout the year, with the goal of making our facilities as safe as possible for the people working in them.”

Training has been increased, say industry bodies, and, in a joint effort with the unions, the government and industry, a set of voluntary ergonomic guidelines for the meat packing industry has been drawn up, described by OSHA as a model for other sectors. “And these efforts have really paid off,” said Mittenthal. “In 2016 we saw all-time lows for industry injury and illness rates.”

According to [the most recent data](#) published by the US Bureau of Labor Statistics “injury incidence in the meat and poultry packing and processing industries has decreased significantly over the past 25 years, reaching an all-time low of 5.3 cases per 100 full-time workers per year”. There remains, according to the Government Accountability Office, [a persistent problem](#) of under-reporting.

In 1994, [according to BLS data](#), the incidence rate for injuries for meat packing plants was over 20. In the case of “lost workday injuries,” points out Mittenthal, the rate for animal slaughtering and processing was 3.8 cases per 100 workers versus 1.7 for “all industries including private state and local government.” A number of industries have higher rates than this.

## Rising Speeds Raise Fears

However, some fear that aspects of a new system being piloted by the USDA may stall that progress. The New Swine Slaughter Inspection System (NSIS) will re-allocate some of the line inspection duties and remove speed caps from the processing lines. USDA estimates that it could potentially save the agency more than \$6m (£4.5m) a year.

But the plans will lead to more injuries, believe unions and workers. “When it’s production at all costs, people are going to get hurt,” said Mark Lauritsen, head of the meatpacking division for United [Food](#) and Commercial Workers (the main union for meat plant worker in the US).

“There’s really no need for this, taking the caps off the line speed – there’s plenty of capacity to kill plenty of pigs ... but they’re just getting greedy about it.”

“I am strongly opposed to any provision that would allow employers to increase the number of forceful repetitions workers are required to perform,” David Michaels, the former top OSHA administrator under President Obama, wrote in response to the plans. “The proposed rule allows employers to increase the line speed without adding additional workers. This will, without doubt, increase worker injuries and illnesses.”

But NAMI argues that the removal of line speed caps is not about speeding things up, but about allowing the line inspector to decide a speed that is appropriate for safety. Plants would not be capped at 1,106 pigs per hour, but they could only operate as fast as adhering to food safety

rules would allow, said a NAMI spokesperson. In fact, under the pilot programs that have been running, some plants actually ran more slowly than the current capped rate, they point out.

The USDA believes that the current inspection system forces vets to concentrate on areas that actually are not the priority for food safety concerns. They believe the NSIS will “improve animal welfare and compliance with the Humane Methods of Slaughter Act (HMSA); improve the effectiveness of swine slaughter inspection; make more efficient use of the agency’s resources; and remove unnecessary regulatory obstacles to innovation.”<sup>64</sup>

## Labor Pains

Some meat processing facilities are struggling to keep doors open amid low unemployment rates, new facilities coming online and a shrinking pool of available labor. RaboResearch animal protein analyst Christine McCracken says that when meat processing reaches its typical peak this fall, not having all facilities running at full capacity may cause an over-supply of live animals for the market.

For livestock producers, that situation could translate into lower market prices.

“At the moment, the pork industry is seeing a tighter supply of workers in its processing sector. This reflects not only very low national unemployment rates but also the recent addition of four new slaughter plants in relatively rural areas with even tighter labor supplies,” McCracken said.

A recent RaboResearch report, [“Animal Protein’s Labor Pains: Industry Bottleneck or Game-Changer?”](#) explores the employment challenges for the meat processing industry and weighs possible solutions. Long-term fixes may include integrating more automation, moving facility locations to areas with more abundant labor pools, or developing more attractive employee and workplace benefits. But in the short term, companies are struggling to recruit and retain workers.

“As packers compete for the same workers, we have seen turnover increase by as much as 50% in the past year,” McCracken says. “We expect the pork industry to suffer first, but the broiler industry will soon follow. With as many as nine new plants and plant expansions underway that will require even more workers in the upcoming 18-24 months, we anticipate turnover and recruitment challenges that will stress the broiler market.”

In juxtaposition to the employment woes of the meat processing industry, U.S. farmers have increased animal production by 8% over the last two years in anticipation of continued growth in consumer and export demand.

“The long-term need to supply the meat products that consumers want is at the center of this challenging labor situation,” McCracken says. “There will be winners and losers in companies’

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<sup>64</sup> Wasley, A. (2018). Two amputations a week: the cost of working in a US meat plant. Retrieved from <https://www.theguardian.com/environment/2018/jul/05/amputations-serious-injuries-us-meat-industry-plant>

abilities to recruit and retain workers, automate, and adapt supply chains. In the short-term, the entire supply chain – including pork and poultry producers – will feel the pinch economically.”

A tight labor environment will create winners and losers in the animal protein sector – companies will differ with regard to their ability to recruit and retain workers, the ability to automate, and the flexibility to adapt supply chains.

Wages have been slow to adjust, while efforts to boost hourly rates have had limited success in reducing turnover. Reinvestment in the work force is imperative. Efforts to improve working conditions and invest in local infrastructure are expected to pay big dividends in recruiting and retaining workers.

Productivity losses associated with automation have dropped, yet benefits vary by species. Integrating new technologies is likely to be the best long-term solution but is not a quick process, especially given equipment backlogs.

U.S. processors may ultimately choose to move high-cost processing to low-cost labor markets and/or consolidate plants – forcing structural change across the entire protein supply chain.<sup>65</sup>

## Seed Corn Industry

Seed corn is a niche market among farmers. Unlike yellow corn, which is grown and used primarily as a livestock feed, seed corn is grown for the purpose of providing seed.

“We’re the farmers for the farmers,” says Kamler, who produces seed corn with his father, Mike. “We plant the seeds that will become next year’s corn seeds for farmers around the world.”

In 2013, Nebraska had 223,000 acres of seed corn planted statewide. Producers such as the Kamlers grow seed corn on a contract basis for agribusiness companies.

“They deliver the seed and tell you when to plant it. The companies cover the cost of the seed and fungicide application,” Kamler says. “As farmers, we give up a lot of our independent liberties because we are contracted with them. Our job is to plant and irrigate, but they take care of all the harvesting. It’s more cost-effective for us than yellow corn.”

In September, seed corn companies use sweet corn pickers to harvest the corn, dumping the ears into wagons and later into semi-trucks to be transported to a plant where they go through drying, husking and cleaning stages before being bagged as seed.

“It’s an amazing process,” Kamler says. “The nice thing for us is with seed corn; we don’t have to hire extra hands. It’s just me and my dad.”

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<sup>65</sup> Ostdeik, D. (2018). Meat processors struggle to recruit, retain workers. Retrieved from <https://www.nebraskafarmer.com/business/meat-processors-struggle-recruit-retain-workers>

Seed corn companies also pay detassellers, provide them with personal protective equipment and safety training, and monitor weather conditions while they are in the fields. Mat Habrock, communications manager for [DuPont Pioneer's](#) Western Business Unit, says the industry provides economic gain for both rural and urban communities.

We employ a large number of people in a lot of different communities. For example, because of the proximity of our seed production facilities to Lincoln and Omaha, we recruit a lot of our detassellers from those communities,” Habrock says.

Nebraska is a key part of DuPont Pioneer's seed production strategy.

“Nebraska provides desirable growing conditions and has great availability of water, which helps us grow reliable, consistent products year in and year out,” Habrock says. “Having our seed production anchored on the I-80 corridor also allows for easy transportation of our products.”

## Detasseling Labor

Before the sun rises in mid-July, a dozen busloads of teenagers and their crew leaders head for the seed cornfields of Nebraska from pickup sites at Lincoln area schools. They are detassellers, and the job that awaits them must be done rain or shine.

“They start at 5 a.m., and we work in most weather conditions except lightning,” says Brent Ailes, operations manager for [Ailes Detasseling](#). The Lincoln-based company organizes and hires detasseling crews for DuPont Pioneer and Monsanto, two of the largest seed companies in the U.S. “Nebraska in the July heat can be brutal, and often the fields are wet and muddy. Many of our first-time detassellers have never been to a cornfield in their life, and this is their first job. Detasseling teaches them what it means to put in a good, honest day of hard work.”

## Detasseling 101

The critical last step in producing hybrid seed corn, detasseling involves pulling off a corn plant's tassel – the pollen-producing top part – so that a corn plant cannot pollinate itself. Modern, GPS-driven machines usually perform the first detasseling pass on a field (a “cutter” chops the tops of the corn, the “puller” uses two rollers to remove the tassel), but because stalks are variable heights, machines can only clear between 60 to 90 percent of the tassels.

The remaining tassels must be removed by hand to ensure a healthy, high-yielding crop. This process is done by simply pulling the tassel out with your hand, then throwing it on the ground.

“The kids are doing the work the machines missed – say, maybe that last 10 percent of tassels the machines didn't get,” says Eric Kamler, a seed corn producer near Shickley. “It's really about quality control. We want to make sure the seed corn is a pure product. If a female corn plant pollinates itself, that's bad because it produces a weak seed kernel for the farmer buying the seed.”

Detassellers can be as young as 13 years old, and though there is no maximum age, most tend to be teenagers. They start out making minimum wage but can earn up to \$15 per hour based on their productivity.

“Our top detassellers can make over \$2,000 in just two or three short weeks, and many of them work for us four or five summers in a row,” Ailes says. “We try to create a team environment and make the experience enjoyable for them because we know they aren’t out there because they love the conditions.”

Conditions can be so humid that rain ponchos are required to keep dry.

“The fields are comparable to a rainforest,” Kamler says.

Ailes Detasseling offers extra incentives to its workers, such as McDonald’s or movie theater gift cards.

“Our crew leaders can use them as prizes for the top workers of the day on their bus. It gives the kids some immediate satisfaction,” Ailes says. “Each crew is on the same bus for the entire detasseling season, so they create their own chants and songs. We’ve seen kids develop great relationships and make lifelong friends.”

Former detassellers often ask Ailes to be a reference for them when applying for college or a job.

“I tell people that if a kid has survived detasseling, then I have no doubt they will accomplish their goals later in life,” he says.

### **Purpose of Detasseling:**

In the simplest of terms, the ultimate purpose for detasseling is to produce a final seed product with specific traits that can be marketed by the seed corn companies. The hybridization process basically involves taking the best traits from one corn variety and cross-breeding with another variety to get the best of both varieties.

The two varieties are planted in alternating rows as the season begins. Once the plants reach a certain stage, and prior to pollination, it’s time for detasseling. The tassels are removed both mechanically and by hand from one of the varieties of corn plants. That way, when pollination does occur, the detasseled plants don’t self-pollinate and are receiving only the desired traits of the other planted variety. Just prior to harvest, the rows of corn that were not detasseled are destroyed, so only hybrid seed is collected.

The extreme detail that companies take in assuring all the undesired tassels are removed gives their farmer-customers confidence they are buying the purest hybrid seed possible.<sup>66</sup>

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<sup>66</sup> Mozo, J. (2016). Detasseling In Nebraska. Retrieved from <https://www.farmflavor.com/nebraska/nebraska-ag-products/detasseling-in-nebraska/>

## Immigration Fears

Some of the peppers you'll see this summer at farmers markets, and grocery stores got their start last week with Felipe de Jesus Aldais Ruiz and his pair of tweezers.

Aldais Ruiz is part of a crew of foreign workers on a Platte County family farm who perform the intensive hands-on labor that makes it possible for the farm to raise vegetables for sale across Nebraska and beyond. Their employer, Daniels Produce, is one of many Midlands agriculture businesses worried that workers might become harder to find, as President Donald Trump looks to crack down on illegal immigration and suspend refugee resettlement programs.

Aldais Ruiz, a 27-year-old Mexican, and the men he works alongside are in the country legally through a visa program for seasonal agricultural workers called H2-A.

Daniels farm manager Kelly Jackson has criticized the H2-A program for what she says is its cost and inefficiencies — reasons other farmers avoid the program in favor of undocumented workers.

But she worries a crackdown on illegal immigration could create a flood of employers applying to use the visa program and make it less likely her application will be processed on time. (Employers using the H2-A visas file the initial applications on behalf of their seasonal workers.) She's also concerned by Trump's recent comments about prioritizing visas for highly skilled workers, wondering if that might mean fewer farm laborers allowed into the country.

That wouldn't be a bad thing, in some economists' and voters' view: They say that if fewer foreign workers come to the U.S. to do the unskilled labor of agricultural work, wages will rise and opportunities will open for American workers. That's also the Trump administration's view.

Still, Daniels and others in agriculture — from on-the-ground farms to industry lobby groups — said they still don't have a good sense of how Trump's immigration policy will shape up or how exactly it will affect them. Many say the policies could disrupt the supply of workers they can't run their businesses without.

At Daniels, for example, growing kitchen-table produce is more labor-intensive than the type of work most other farms in the county undertake: planting commodity-type corn and soybeans with huge machines.

One morning this month the H2-A workers formed a pepper-planting assembly line: One filled trays with soil, another ran a small machine that placed one seed in each section of the tray, and Aldais Ruiz used his tweezers to remove any doubled-up seeds, before he covered the seeds with more soil and soaked each tray in a tank of water.

The 80 or so workers Daniels hires each year are paid a government-mandated \$13.79 an hour, plus housing and transportation, for a job that Daniels says it is hard-pressed to find local workers for, mainly because the work is seasonal, but also because it's physically demanding —

not just painstaking planting, but operating and repairing equipment, hoeing weeds, and picking and packing vegetables.

The nearest town, Monroe, has fewer than 300 residents, and the unemployment rate across Platte County, which includes Columbus, has been under 4 percent for most of the past four years.

If the government is going to tighten up immigration rules, Jackson said, “first you need to give us a pathway for workers.”

It’s a refrain heard throughout agribusiness, with industry leaders calling for expanded guest worker programs and a pathway to citizenship for unauthorized or temporary workers.

There’s support in farm country for Trump’s stance on deporting unauthorized workers. Almost three-fourths of respondents to the 2006 Nebraska Rural Poll said undocumented immigrants should be deported. Only a third said guest worker programs should be created to allow foreigners to work here without becoming citizens. The poll of about 2,500 people in rural areas is conducted annually by the University of Nebraska-Lincoln; it last asked about the subject in 2006.

## **Labor Concerns Curdle the Dairy Industry**

Across Nebraska and Iowa, it’s not just produce farmers who worry.

Meatpackers, dairy farmers and others in the states’ huge agriculture and food-processing industries rely on the labor of foreigners, immigrants, and refugees. These workers slaughter and process cattle and hogs, milk cows, operate food factory equipment and more. They also spend at least some of their paychecks at local businesses.

Employers say they strive to hire only those authorized to work in the country. But they can’t always tell, they say: Federal law prohibits employers from rejecting documents that look reasonably authentic, or from asking immigrant workers for employment verification papers different from what they require of native-born workers.

Take Nebraska’s dairy farms, employing as many as 600 people — about one for every 100 milk cows, said Rod Johnson, executive director of the Nebraska State Dairy Association. Immigrant workers are essential to the operations of these Nebraska farms, which sell \$300 million worth of milk a year, he said.

“We would like to think they’re all legal immigrants, but finding and keeping a full staff on hand is often a challenge,” Johnson said.

He said dairy operators are conscientious and inspect the paperwork they’re given, in some cases using the federal E-Verify program, but sometimes can’t be certain.

“What we do find is most of the immigrant workers that show up are very eager to work,” he said.

It’s a problem for the dairy industry nationwide. The National Milk Producers Federation this month called for a year-round guest-worker program, and for an amnesty or path-to-citizenship program that would allow unauthorized workers to earn the right to work legally in the U.S. Right now, guest agricultural workers can come to the U.S. only seasonally; Daniels farm workers return to their home countries every winter, but dairy farms need year-round help.

“As important as border security and interior law enforcement procedures are, such measures must be paired with a focus on current and future agricultural labor needs,” milk federation CEO Jim Mulhern wrote in a column.

Such needs could be ignored if the Trump administration focuses on “highly skilled” foreign workers, slowing the pipeline of lower-skilled workers that provide farm and meatpacking labor. Supporters say focusing on higher-skilled immigrant workers will put more Americans to work in labor-intensive industries.

## **Willing to Work?**

Don Stull, a University of Kansas anthropology professor who has studied the meatpacking industry for decades, called it “folk mythology” that native U.S. workers wouldn’t take meatpacking jobs if the pay were raised. With today’s plants largely located in rural areas, jobs that start around \$12 or \$13 an hour are already “a whole lot better than what you can earn in other jobs in rural America,” such as fast-food wages.

Still, Jackson and others in the ag industry say there are simply not enough Americans in rural areas to staff ag operations — and those who do apply tend to be less reliable.

The Pew Research Center estimates that about 30,000 unauthorized immigrants work in Nebraska, an estimated 3.2 percent of Nebraska’s total labor force. They are heavily represented in a handful of industries, making up 18 percent of Nebraska’s construction workers; 9 percent of production workers, a group that includes food processing; and 5 percent of farm laborers, Pew said.

Foreign-born workers make up about a third of the nation’s butchers and other meat-processing workers, according to Pew. About half of those foreign-born workers are authorized to work.

A spokesman for meat processor Greater Omaha Packing said he didn’t know what the effect of Trump’s policies might be on the meatpacker, with about \$1.8 billion in annual sales. But one thing’s for certain; he said: Foreign workers are essential.

“Greater Omaha Packing believes that we have essentially reached full employment in our area and need to avail ourselves of non-U.S. workers who are willing to fill the jobs we have available that would otherwise remain unfilled,” company attorney Mark Theisen said.

The beef processor has employees from at least 17 countries and said it uses E-Verify, a voluntary Department of Homeland Security program, to check documents.

Tyson Foods, with several plants in Nebraska and Iowa, said it does not expect Trump’s tough stance on illegal immigration to affect its operations. Tyson also uses E-Verify and participates in other government programs that aim to ensure immigrants are eligible to work.

## Pipelines of People

New policies restricting refugees, though, might have an impact. Nebraska has resettled more refugees per capita than any other state, and many refugees have found jobs in meatpacking. Amid tighter immigration regulations post-9/11, packers have favored hiring refugees because they are authorized to work, are seen as hard workers and sometimes help recruit friends and family, Stull said.

Lutheran Family Services, the main agency assisting refugees in Nebraska, typically places 300 to 350 refugees a year in jobs here. Agency officials said about half of new refugees hired each year in Nebraska, especially those with limited English, work in meatpacking and other agriculture-related jobs. Lutheran Family Services has connected refugees with jobs at Tyson Foods, Cargill and other processors. Even refugees who first arrive in other states sometimes join friends and relatives in meatpacking jobs in Nebraska cities.

In a state with one of the nation’s lowest unemployment rates, and with a labor force that hasn’t seen much growth since the end of the Great Recession, employers are eager to hire refugees despite a language barrier, said Ryan Overfield, a Lutheran Family Services official.

“Employers are always looking for pipelines of people,” he said. “While communication is important, what they need most is someone who is motivated and dependable.”

Demand for meatpacking workers is only set to grow, with large new processing plants planned in the Midlands.

Lincoln Premium Poultry looks to hire 800 to 1,000 people for its planned Fremont plant, which will slaughter and package chicken for sale at Costco stores starting in 2018.

Pork producer Seaboard Triumph Foods will hire as many as 2,000 workers for two shifts at a new Sioux City, Iowa, pork processing plant; the first shift will start up this summer. Tyson is adding 350 jobs to its expanding Council Bluffs plant, where workers process cuts of beef and pork for retail sales.

Help-wanted ads describe the hard, physical labor. Tyson’s job postings mention repetitive movements, cold and damp air, long periods of standing, knife work, and the need to lift up to 50 or 75 pounds. Applicants have to be ready to work any shift and need a pair of steel-toed boots.

## Looking at Options

Why can’t dairy farmers and meatpackers just raise wages to attract more native U.S. workers?

Some might, but both industries compete in a worldwide commodities market and have limited ability to profitably increase prices to cover raises. Operators say they already pay competitive wages.

More likely than raising wages might be replacing workers with technology. Costco’s plant managers say they are cutting down on labor needs by investing in robotic de-boning equipment. Plainview, Nebraska, dairy Demerath Farms this month started using robotic milking systems, saying the shift let it expand its herd without hiring more people.

A third possibility is that producers will cut back on production, which might mean fewer jobs, said Eric Thompson, University of Nebraska-Lincoln economist.

## Affecting Rural Growth

A restricted flow of immigrants could hurt rural growth beyond agriculture, Thompson said. International migration is a major reason Nebraska has a growing population, especially in some rural counties that are home to meatpacking operations.

And it could stifle wage growth overall: The more people in an area, the higher the wages tend to be, he said.

“The economy will create more opportunities if there are more workers and if our cities and towns are larger,” he said.

The Center for Rural Affairs said some rural businesses, including construction companies, are wondering what’s ahead this summer if migrant workers don’t show up as usual.

Some workers may be wary of even leaving their homes.

“In our rural areas, it’s a lot of uncertainty right now,” said Karina Perez, executive director at Centro Hispano, an immigration services agency in Columbus. The agency offers citizenship preparation classes and has seen increased interest among meatpacking workers in Schuyler and Madison. They may be authorized workers, she said, who now feel increased urgency to take the next step of becoming citizens.

At Daniels Produce, some H2-A workers are concerned about the political upheaval; others say they don’t worry about it.

H2-A worker Claudio Meijia, 39, has worked for Daniels for seven years and said the job is a blessing that has provided a better life for his two sons in Guatemala, helping to keep the lights on and pay for essentials like shoes. He watches the news and is worried the proposed policy changes might limit his ability to work in the U.S.

For his family, he said, “It would be like going backward.”

Aldais Ruiz — the pepper planter — has worked at Daniels seasonally since 2009, supporting two daughters and a son in Mexico. He said he doesn’t worry but appreciates the ability to work legally, where his employer doesn’t take money from his check to cover rent or other costs.

Jackson, the farm manager, is hoping that the Trump administration will bring the immigration overhaul she’s been waiting for — something that will preserve the workers she has now and even allow more workers into the state. Her 500,000 pepper plants are depending on it.<sup>67</sup>

## Livestock

Nebraska is seeing an increased interest in livestock feeding, particularly among young and beginning producers. Nebraska is the place to be when considering livestock expansion for many reasons. The state’s greatest assets include available water, plentiful feed stuffs, isolation and most importantly hardworking farmers who understand a strong work ethic.

Nebraska is the largest irrigated state in the nation. Through diligent work of the NRD’s, Nebraska has managed this critical resource and allows Nebraska to be sustainable in crop production. Nebraska also sits above the largest regenerating aquifer in the world. The Ogallala Aquifer is estimated to contain five times the water of Lake Erie.

Nebraska has a number of advantages because of its location and resources. Ranking No. 3 in corn production and No. 6 in soybean production makes Nebraska an enviable place to feed livestock. There is a huge untapped potential for farmers to add value to their commodities through protein production. The populations of the world have an appetite for protein food, not raw commodities.

Many farms and ranches in Nebraska have been in families for generations. Unfortunately, bringing the next generation back to a family operation is more difficult than ever before. With the current price of land and fluctuation of commodity prices, beginning farmers are finding it difficult. Through food chain alliances, young farmers can mitigate risks, create sustainable incomes, build equity and enjoy the benefits of diversification. By adding livestock production to a row crop farm, incomes are created in several income streams versus only the value of the

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<sup>67</sup> Solderlin, B. (2017). Nebraska, Iowa agriculture businesses fear Trump’s immigration policies will cause loss of labor. Retrieved from [https://www.omaha.com/money/nebraska-iowa-agriculture-businesses-fear-trump-s-immigration-policies-will/article\\_6f1ec62d-b34e-597e-92dd-a4be2f4f4b7e.html](https://www.omaha.com/money/nebraska-iowa-agriculture-businesses-fear-trump-s-immigration-policies-will/article_6f1ec62d-b34e-597e-92dd-a4be2f4f4b7e.html)

crops. This creates a value-added scenario, which economically supports not only the family but also the communities they live in.<sup>68</sup>

A great example of this value-added scenario is the Costco/Lincoln Premium Poultry project in Fremont and northeast Nebraska. Lincoln Premium Poultry is offering the opportunity for Nebraska farmers to become partners in growing the chickens to be marketed through their retail stores.

Through food chain alliances and custom feeding, young and beginning farmers can guarantee their household and loan expenses, while building equity and contributing to their communities. The farmer-growers will be creating a tax base as they build the poultry houses. With the new market created to use corn and soybean meal, farmers have the opportunity to receive higher prices for the crops they grow. The feed created for the poultry will require 350,000 bushels of corn per week and 3,000 tons of soybean meal every week.

Another great example is created through custom feeding of market pigs in Nebraska. With three major pork processors — Smithfield Foods in Crete, Hormel in Fremont and Tyson Foods in Madison — Nebraska is a perfect location for custom pork production. Again, with close proximity of feedstuffs and processing, feeding pigs is an opportunity to diversify, mitigate risk and bring the next generation back to the family farm.

According to a third-party study, the Costco/Lincoln Premium Poultry project is proposed to bring \$1.2 billion to the state annually. This equals about 1% of the state's current gross product. And entrepreneurial opportunities will abound, meeting the needs of a growing livestock and poultry industry. Through managed use of natural resources and use of our commodities grown in Nebraska, we can become the state that feeds the appetite of a growing world population while keeping funds in our state.<sup>69</sup>

## NAFTA

“The announcement that the U.S., Mexico, and Canada have come to terms on a new and improved free-trade agreement is a major ‘win’ for Nebraska’s farmers and ranchers and an important step forward in helping eliminate trade related uncertainty in agricultural markets.”

“Mexico and Canada are Nebraska’s two largest customers for agricultural goods. This new deal not only maintains the positive market access system for our major commodities in Nebraska but also sweetens the pot by addressing many concerns for our dairy producers, including improved market access.”

<sup>68</sup> Nebraska is the place to be for livestock expansion. (2018). Retrieved from <https://www.nebraskafarmer.com/livestock/nebraska-place-be-livestock-expansion>

<sup>69</sup> Nebraska is the place to be for livestock expansion. (2018). Retrieved from <https://www.nebraskafarmer.com/livestock/nebraska-place-be-livestock-expansion>

“Exports of Nebraska agricultural goods to these two countries exceeded \$2.9 billion in 2016 and accounted for 45 percent of Nebraska’s total agricultural exports that year. Mexico and Canada are major customers for Nebraska beef and Mexico has been a top customer for Nebraska corn, and the second-largest customer for Nebraska soybeans and wheat. These countries are also major importers of ethanol and distillers dried grains from Nebraska.”

“Any way you slice it, Mexico and Canada are critically important customers for Nebraska agriculture. We applaud the President for his work to get the U.S., Mexico, Canada Trade Agreement (USMCA) done. This is more positive news following the signing of an updated free trade deal with South Korea (KORUS), and news that the U.S. is in negotiations on a new bilateral deal with Japan, and in talks with the European Union. While there is still much work to be done with China, these actions have us on the right path to providing access for Nebraska agriculture commodities to global customers who are critical to Nebraska farm and ranch families. We look forward to continuing to work with this administration to grow market access for our products around the globe and with Congress to assure passage of the USMCA.”<sup>70</sup>

During a June 4 presentation at the Sosland Purchasing Seminar, Christine McCracken, an executive director at Rabobank focusing on animal pointed out that concerns over how US policies with regard to the North American Free Trade Agreement (NAFTA) will affect the US economy is top of mind for Rabobank clients. She pointed out that US reliance on shipments of beef, pork and chicken to NAFTA partners and China is significant, comprising 40 percent of total proteins exported from the US. She said the US chicken industry isn’t as dependent on exports as some other proteins, including beef and pork.

The last significant hiccup for the US export market is Woody Breast Syndrome which continues to be a challenge for the poultry industry as the mysterious myopathy inexplicably takes a toll on the profitability of boneless chicken breast meat along with the competition for center of plate among all proteins.

While the number of birds slaughtered in the spring are down, demand at retail and foodservice remains strong, and US exports of leg quarters are offsetting sagging pricing and demand for wings. “That goes back to when wings rallied last summer, and it essentially killed foodservice demand for wings,” McCracken said. Wing prices topped \$2.15 per lb. in September 2017 but dropped to under \$1.40 per lb. in May 2018.

Pork segment pricing is somewhat of a mixed bag looking to the future. “Hams have been under pressure in the last several weeks partially due to the export issues and partially due to this big increase in slaughter over the past two to three months,” McCracken said. Prices for loins have begun to rebound from a colder-than-expected beginning to the grilling season. Belly

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<sup>70</sup> Steve Nelson, C. (2018). Statement by Steve Nelson, President, Regarding U.S., Mexico, Canada Trade Agreement (USMCA). Retrieved from <https://www.nefb.org/newsroom/news-releases/1330-statement-by-steve-nelson-president-regarding-u-s-canada-mexico-trade-agreement-uscma>

inventories are low for this time of the year and well below the same time a year ago, but a summer rally is expected.<sup>71</sup>

## Nuts

In 2005 several members of Nebraska Nut Growers Association felt the need for a cooperatively-owned business to assist nut growers with selling unused or extra product, starting with black walnuts and pecans. This began Heartland Nuts ‘N More, a cooperatively-owned business spanning four states: Nebraska, Iowa, Kansas, and Missouri. Larry Martin was one of the original starters of Heartland Nuts ‘N More and today is one of the leading members.

The idea for using black walnuts and pecans developed out of years of research conducted by Nebraska Nut Growers Association through the University of Nebraska—Lincoln. Martin said they had been doing research for about 35 years to learn how to grow a better black walnut in the Midwest and how to get pecans acclimated to the Midwest climate since they are normally grown in the southern part of the United States.

Using this research, it was discovered that due to Nebraska’s shorter growing season, about three months, producers could grow a nut that retained more of its natural oils which created a better, sweeter flavor. This occurs because the husk of the walnut is removed while the nuts are still green so none of the oils seep out and the meat does not darken. Martin said in the south the nuts tend to dry out due to the longer season.

*“[Our methods] give [the black walnuts] a much sweeter taste. None of that bitterness you get with other methods of processing the black walnut.”*

*-Larry Martin*

Martin said they always planned on starting a cooperatively-owned business, but that meant they needed members. The group started by collecting promissory notes or ‘letters of indebtedness’ from their (future) members. These letters were used to secure funds and product for the business.

The group also received some help with business and financial planning. Heartland Nuts ‘N More was introduced to Jim Crandall of Nebraska Cooperative Development Center (NCDC) through Grow Nebraska. NCDC assisted Heartland Nuts ‘N More with some initial work and securing grant funding. They used these grants to purchase production line machinery, such as nut crackers, and building improvement.

*“If we hadn’t received those grants, we probably wouldn’t have started up at all.”*

*-Larry Martin*

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<sup>71</sup> Crews, J. (2018). Pork, poultry industries face supply and labor challenges. Retrieved from <https://www.meatpoultry.com/articles/19603-pork-poultry-industries-face-supply-and-labor-challenges>

## The Business & Products

Heartland Nuts 'N More began with 32 member orchard growers and, as of 2010, had 46 member orchard growers. Several of these members boast large orchards including John Knorr, current president of Nebraska Nut Growers Association, who has around 2500 pecan and 1500 black walnut trees.

Heartland Nuts 'N More is selling black walnuts and pecans in several local stores in Omaha and Lincoln including Boiler Room, Whole Foods, Open Harvest, Ideal Foods, and Grow Nebraska. There are also a few businesses that use Heartland Nuts 'N More nuts in their products. Bakers Candies have used them to make black walnut clusters for a couple years, and Martin said: "they're just flying out the door!" Heartland Nuts 'N More is also currently in negotiation with Prairie Land Dairy who is looking into using black walnuts and pecans in some of their ice cream.

Customers can purchase the nuts online through Heartland Nuts 'N More's website or Nebraska Nut Growers Association's website, as well as, the Grow Nebraska stores in both Kearney and Grand Island. They also worked with Grow Nebraska at the 2009 and 2010 Nebraska State Fairs. Martin said they are looking into more year-round markets to sell through and more opportunities to market in the Omaha area.

The main reason Heartland Nuts 'N More black walnuts and pecans differ from the competition is because of the way they are grown; all of their products come from only grafted black walnut and pecan trees. The members plant during spring, April to June, or fall, September to November, but most of the new trees are not added through planting but through grafting. The members graft the trees during the last two weeks in May and first two weeks in June. To start the grafting, a grower takes a piece of scion wood from a mature black walnut or pecan tree and inserts the scion wood under the bark of a seedling. The limb will eventually attach itself to the younger tree creating a new limb. This process allows grafted trees to pollinate and produce nuts earlier than native trees, as well as, producing larger nuts; which is a characteristic of the mother tree.

"The weeks we graft the trees is the best time of the year because all the members come together and help out," said Martin.

Grafting creates a larger nut with a thin shell that's very easy to crack. Heartland Nuts 'N More grafted walnuts tend to have about 35-36% nut meat to nut while native or non-grafted trees tend to have about 6-8% nut meat to nut.

Harvest begins in late September and continues through October. During harvest, they use a mechanized shaker to shake as many trees as possible to loosen the nuts and then catch the nuts on tarps or plastic. They also have a nut harvester to pick all the nuts up off the ground.

When the members bring the nuts to the hub site in Valparaiso the nuts are cracked with machines.

The walnut cracker can crack 300 pounds of walnuts in one hour, and the pecan cracker can crack 500 pecans in one minute. The walnuts are then separated, using another machine, between dark and light-colored nut meat. The nuts are all processed and packaged at the hub site, where they are kept in a cooler storage until they ship out for sale.

Sales for Heartland Nuts 'N More are higher during the fall season due to an increase in baking; especially with pies, cookies and brownies. Martin stated that last year (2009) they brought in between 20 and 25 thousand pounds of black walnuts to crack and about 4000 pounds of pecans.

## The Challenges

This year's (2010) growing season did not produce the best pollination for black walnuts and pecans. Black walnut trees are air pollinated, so they rely on wind to blow pollen from the male to the female flowers, but this year a majority of pollen either blew away or was washed away by abundant rains. Martin stated this problem appeared nationwide. Likewise, pecans suffered due to blooming or pollinating too soon.

A unique challenge that Heartland Nuts 'N More faces is running a business across four states when there is only one hub site, and all members are volunteers. Martin said they face problems when trying to get members to help process and package the nuts.

"A big problem is to have to call anyone in that lives outside Lincoln or Omaha," Said Martin. "It takes time and money, and everyone has to volunteer both."

Another challenge the business faces is finding time and funds to market their products. Advertisements in magazines and on websites are always useful, but what really helped recently was a grant to fund upgrading their brochures. Martin stated that the only way a business can increase their profits is through selling product, but the only way to sell more products is through better marketing.

## The Future

As of 2011 Heartland Nuts 'N More is working with the Nebraska Forestry Service to grow a good product of hazelnut trees. They are currently researching the feasibility of these products and receiving help writing a grant. Martin said they are also hoping to do some constructive expansion to their hub site to hold a larger number of nuts and are looking into another storage area in Valparaiso.

Heartland Nuts 'N More is planning to expand their product line in the near future with some walnut by-products made from the husk, shell, and black walnut juice. A by-product using the

black walnut husk is a dietary supplement pill used as an intestinal cleanser. The black walnut juices can be used as a wood stain or a tanning stain. The shell can be used similar to sand blasting; the shell is ground up in different grades from course to fine. The coarser grades are used for blasting, but the walnut shell pieces stay intact and sharp, so they can be reused four to five times rather than just once like sand. Martin said one of the medium grades is used as a facial cleanser and the finest grade is used in dental polishing.

Lastly, when asked what advice he would give to other entrepreneurs looking into cooperatively-owned businesses Martin replied, “You need to have a good membership in the coop, and you need to have a good attorney and a good banker and people like NCDL to help with grants; unless you have a Warren Buffett.”

For more information on Heartland Nuts 'N More, please visit their website at [www.heartlandnutsmore.com](http://www.heartlandnutsmore.com)<sup>72</sup>

## Potatoes

Nebraska’s water resources, sandy soils, and favorable climate promote great potato yields. Nebraska’s central location in the United States also is a marketing advantage. Potato planting in eastern Nebraska begins in early April for a summer harvest, while central and western areas plant in early May for a fall crop. Unlike most other crops, potatoes are stored and marketed directly by the producers, creating year-round jobs.

Nebraska has ranked high as 10th in the nation for potato production at 8.4 million hundredweight. About one-third of the states’ potatoes are processed into potato chips. The rest of Nebraska’s potatoes are table potatoes for grocery stores and seed potatoes.

- Special storage facilities keep potatoes fresh throughout the winter.<sup>73</sup>

Final production for the 2017 Nebraska potato crop totaled 9.03 million cwt, up 22% from 2016, according to the USDA's National Agricultural Statistics Service. Planted acres for 2017 totaled 19,000, up 15% from 2016. Harvested area, at 19,000 acres, was up 16% from the previous year. Yield for all potatoes averaged 475 cwt in 2017, 25 cwt per acre higher than the 2016 average yield.

The value of potatoes sold from the 2017 crop totaled \$98.4 million, up 38% from 2016. The marketing year average price was \$12.10 per cwt, up from \$11.00 for the 2016 crop. Potatoes sold from the 2017 crop totaled 8.13 million cwt, up 25% from 2016. Sales accounted for 90% of production, unchanged from the 2016 crop.<sup>74</sup>

<sup>72</sup> Network University. (2010). Heartland Nuts 'N More | Nebraska Cooperative Development Center. Retrieved from <https://ncdc.unl.edu/heartlandnuts.shtml>

<sup>73</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

<sup>74</sup> Nebraska Potato Production up 22% from Previous Year. (2018). Retrieved from <https://cropwatch.unl.edu/2018/nebraska-potato-production-22-previous-year>

When you rip into a bag of chips or pop some popcorn, you may be supporting farms in Nebraska, where agriculture is much more than corn and cattle.

"I really do think diversification is important for agriculture in Nebraska," said Ben Zechmann, manager of CSS Farms near Minden.

Nebraska produces some of the world's best steaks, but also your favorite snacks.

Zechmann said, "Most of the potato chips you eat in our area probably came from our farm."

He oversees a potato operation that blends into the Nebraska landscape.

"I grew up 20 miles from here and had no idea this operation was even in existence," he said.

Conventional farms are getting bigger, and Zechmann sees peril in becoming too dependent on corn and soybeans.

"With consolidation come risk for stagnation. Innovation is key for agriculture, and if people get complacent, that innovation will stop," he said.

## **Special Challenges for Specialty Crops**

Vineyards have popped up in Nebraska, plus fruits, veggies, trees, and more. Even farms that appear conventional may be growing white corn, popcorn, or organic corn.

Extension Educator Elizabeth Killinger said, "There's a lot of interest in specialty crops because it's smaller scale, but it is more manpower and lot more infrastructure."

She said just as Nebraska wines have been bottled in recent years; now the local brewery scene drives interest in potential for hops. But like potatoes, she says there's a lot of upfront cost, but also opportunity.

"Especially with hops, the demand is out there. They want locally grown hops so if you have the infrastructure and you have crop; there's a market," Killinger said.

She cautioned if the market grows too quickly, those who grow hops could face challenges.

She said anyone who wants to grow a specialty crop needs to pencil out the numbers. She said convincing a banker can be tough.

"Working with your bank to educate them on what your markets are," she said.

And vineyards and other specialty crop growers worry about herbicides that drift, damaging grape production for much more than a single season.

"Then you're out several years of production while waiting for vines to get good size so you can harvest again," Killinger said.

Labor's a challenge for CSS Farms. It takes a dozen or two people year-round, plus more to plant and harvest. And Ben Zechmann says the cost to raise a crop can be three- or four-times what corn would be.

He said, "This is a high-risk, high reward crop. We'll spend the money to get the product."

And potato farmers say they can just about forget crop insurance.

"It's essentially uninsurable in our area," Zechmann said.

Some conventional farmers like Clay Govier of Custer County explore rotational crops that could benefit the soil and diversify their finances, with things like field peas.

"It's a growing market, and there's a lot of potential. There's more that are grown in the panhandle, don't see much in central Nebraska but demand is certainly growing," Govier said.

The support system for corn is strong, with grain elevators, agronomists, and seed dealers. But specialty crop growers often have to hunt for the basic equipment.

Zechmann said, "We tear a piece of machinery down to the frame and rebuild to our specifications."

Potato farms pay more for rent. Zechmann said potatoes will be grown on any given field, every third year in rotation with corn. So, to have annual production, CSS Farms has to have about four dozen fields to work with.

Plus, Zechmann says agribusiness companies don't compete for their business, so they don't see the innovation corn and soybean growers benefit from, like new herbicides and chemistries.

For CSS Farms, they take pride in sustainability, while producing a product their customer wants. In this case, it's the nation's number one potato chip producer who contracts to buy most of their potatoes, getting them from the farm to the bag ready to be shipped to grocery stores in about 24 hours.

"We have the best product possible at all times," Zechmann said.

Nebraska has the climate and soil, but Ben Zechmann says the people make it work.

"That's what it takes," he said. "If we didn't have these guys, none of this would happen."<sup>75</sup>

## Poultry

Most of the poultry raised in Nebraska are laying hens that play an important role in supplying eggs for further processing by egg companies in the state. Processed eggs are used for commercial, food service, and home use and include refrigerated liquid, frozen, dried and specialty egg products.

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<sup>75</sup> White, S. (2018). Potato chips, wine, and peas highlight diversity of Nebraska agriculture. Retrieved from <https://nebraska.tv/news/ntvs-grow/potato-chips-wine-and-peas-highlight-diversity-of-nebraska-agriculture>

They are comparable to shell eggs in flavor, nutritional value and most functional properties. There also are chickens raised for meat, called broilers, and turkeys raised in Nebraska.<sup>76</sup>

More than 9.5 million birds populate Nebraska's commercial laying facilities and produce more than 2.8 billion eggs each year.

- Nebraska ranks 10th nationally in egg production.
- Broilers grow from hatchling to 4-5 pounds in about seven weeks.
- A small number of commercial turkey producers raise birds that are exported to Iowa and Minnesota for processing.<sup>77</sup>

## Nebraska's Expanding Poultry Sector

In June, Costco broke ground for its new state-of-the-art poultry processing facility near Fremont. The plant will begin production in April 2019 and is expected to bring about 800 jobs to the community and bring an economic impact of \$1.2 billion each year. In August, Hendrix Genetics opened the doors for its new chicken hatchery in Grand Island, and in October, opened the doors for its new turkey hatchery in Beatrice.<sup>78</sup>

In June, Gov. Pete Ricketts joined Fremont Mayor Scott Getzschman and officials from Costco, Lincoln Premium Poultry, the Greater Omaha Economic Development Partnership, and Greater Fremont Development Council to break ground for a new state-of-the-art poultry processing plant, hatchery, and feed mill facility near Fremont.

The project has made headlines over the last year-and-a-half, since early 2016, when it was announced that a then-unnamed company was considering the Fremont area to build a new poultry processing facility.

In the spring of 2015, it was announced the Costco had selected Fremont to build the state-of-the-art facility, and Lincoln Premium Poultry, its subsidiary, would work with local growers to raise birds to supply the facility.

The new facility is set to start production on April 15, 2019, and Jonathan Luz, director of strategic planning at Costco, noted the groundbreaking is just the beginning.

"The work really has just begun. It's now time to put the vision we all share into action and results," Luz said. "I know I speak for my entire management team when I say we are eager to continue our work with the community officials at all levels, our trusted construction partners, and with everyone else involved to in order to this business something that Fremont, Nebraska, and Costco can be truly proud and fortunate to be a part of together."

<sup>76</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

<sup>77</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

<sup>78</sup> Harris, T., & Arens, C. (2018). 2017: Big year for Nebraska agriculture. Retrieved from <https://www.nebraskafarmer.com/farm-operations/2017-big-year-nebraska-agriculture>

## Big economic benefits

Gov. Pete Ricketts and other supporters of the project have pointed out the significant economic benefits the project will bring.

Ricketts noted with the \$300 million investment in the facility; there will be roughly 800 jobs created, from production and maintenance to IT and management.

There will also be a network of about 120 farmers in a 12-county area – most of them raising broilers to supply the facility's needs to process 2 million chickens a week. The rest will raise pullets and laying hens to produce chicks to raise as broilers. "One hundred twenty farmers will be able to diversify their revenue stream by putting up these barns. That's a big deal," Ricketts said. "It's a big deal because it creates another income stream for our farmers and certainly one of the things we've seen with low commodity prices is that is going to be its welcome news for the area. It will also create a market for their corn and soybean meal."

About 350,000 bushels of corn and 3,000 tons of soybean meal will be needed every week to feed the poultry.

Ricketts added the project will have a \$1.2 billion economic impact on the state every year – that's about 1% of the state's current gross state product.

In 2016, Site Selection Magazine awarded Ricketts the Site Selection Governor's Cup due to Nebraska having the most economic development projects per capita of any state in the nation. "In fact, we had more projects than North Dakota, South Dakota and Kansas combined," Ricketts said. "We want to build on that momentum. That's why we want to continue to have a customer service organization in the state of Nebraska to build a team to be able to help serve the companies like Costco and Lincoln Premium Poultry."

## Work to be done

The project has garnered plenty of attention since its announcement in early 2016, and that has included supporters and detractors. Fremont Mayor Scott Getzschman noted throughout the last year and a half; public hearings have been a big part of the process. "Because of this testimony and considerable due diligence by Costco and Lincoln Premium Poultry, the citizens of Fremont can rest assured this will be a safe and environmentally friendly project," Getzschman said.

The building's first day of operation is set for April 15, 2019, but Getzschman noted there's a lot to be done before then. The City of Fremont is working with the Nebraska Department of Roads to develop the new Fremont Southeast Beltway, a four-mile divided expressway, which is expected to help improve traffic to and from the facility. In addition, the City of Fremont is

working with the Nebraska Department of Labor to secure a workforce for Costco and Lincoln Premium Poultry, as well as existing businesses in Fremont.<sup>79</sup>

## New Revenue

While there's a learning curve involved for most Nebraska growers, poultry production provides an additional revenue stream for farms.

When Colten Schafersman graduated from college in 2013, it wasn't exactly the ideal time to get involved in row crop farming.

"That was the year prices tanked. Over the last five years, I've rented farm ground with my grandfather, but it just covers my living expenses. It doesn't really give me a chance to buy back into the farming operation," says Schafersman.

That's why Schafersman recently built three chicken barns — two pullet barns and one rooster barn — on 100 acres near Hooper, Neb. Schafersman's is one of over 100 sites being built to raise chickens for Lincoln Premium Poultry — the company that's managing the production process for the new state-of-the-art Costco poultry processing facility in Fremont, Neb. Most of the sites will be broiler sites, but Schafersman's operation is one of the few raising pullets.

In late September, Schafersman and Lincoln Premium Poultry hosted an open house at the new pullet site, drawing more than 500 people, including neighbors and elected officials as well as prospective poultry producers.

"It was very positive. The nice thing about it is it gave people the opportunity to get a sense of what exactly this will look like, and also see a lot of the technology we'll be using and get comfortable with it," says Jessica Kolterman, external affairs spokesperson at Lincoln Premium Poultry. "I think the biggest challenge from the standpoint of prospective growers is having no concept of what this is actually like. There aren't a lot of places in Nebraska they can touch it and feel it and stand in those barns. This provides them a good opportunity to see it in person and get comfortable with this kind of operation."<sup>80</sup>

## Getting Things Growing

It takes a certain number of producers to raise 2 million birds weekly to supply the plant, and it takes a consistent market provided by the facility for those producers. Bringing those two things together simultaneously is a feat in and of itself.

The facility is projected to start operating in September 2019, and all 432 broiler barns needed to supply it will be completed by then. Ideally, the barns scheduled to provide the first shipment of broilers will be producing birds by 10 weeks before.

<sup>79</sup> Harris, T. (2018). Costco breaks ground for poultry processing plant. Retrieved from <https://www.nebraskafarmer.com/livestock/costco-breaks-ground-poultry-processing-plant>

<sup>80</sup> Harris, T. (2018). Pullet barns bring more revenue for Nebraska grower. Retrieved from <https://www.nebraskafarmer.com/livestock/pullet-barns-bring-more-revenue-nebraska-grower>

For every building, all the dirt work and construction will be finished, and within 30 days before the first flock of birds comes in, the electrical wiring will be installed.

“From the time you express an interest in building to the time you’re up and running, it’s about six months,” says Walt Shafer, project manager at Lincoln Premium Poultry. This includes site approval, engineering and developing a nutrient management plant. “With that asset, they don’t want it sitting idle for very long. It takes a little over six weeks to grow a bird from chick to a bird that we need.”

## Computer Controlled Chicken Farm

The biggest challenge is introducing a new production system to producers not familiar with poultry production, or the technology that goes with it. “The biggest challenge is really [that] no one knows poultry,” Shafer says. “Growers get intimidated by this technology, but we have service personnel that will work with them for as long as they’re raising birds with us.”

Those 600-by-63-foot barns are all automated and computer-controlled, Shafer says. He manages four barns of his own in Virginia. “You can look at an iPad or iPhone and make adjustments from here on my farm in Virginia,” he says.

The technology includes automated weigh cells that keep track of chicks’ weights as they walk across the barn and automated record keeping of feed inventories for every bin, as well as temperature sensors, water meters, automated vents, cool-cell technology, and tunnel ventilation.

The cooling system includes vent inlets every 16 feet throughout the barn. Tunnel ventilation and cool-cell technology are used to keep the birds cool.

Cool-cell pads on each side of the barn feed the tunnel intake and cool the air as it goes through the inlets into the barn. During the heat peak days of the summer, that tunnel door opens to let in a massive amount of air.

“Then the sensor will tell the well to start saturating this cooling cell with water. Now the air is going through a water-saturated medium, like if I put water on your shirt and ran air over it,” Shafer says. “It’s almost worth a 30-degree temperature change on that bird.”

That automated technology extends to bird handling in the barn. Each broiler barn will have 42,000 birds at a time, with six flocks going through the barn annually.

“Six-and-a-half weeks after chicks come to the barn, I’ve got machines that drive through that barn that look like combines. We’re doing automated chick catching,” Shafer says. “It handles the birds better than catching them by hand. The technology will benefit both birds and handlers.”

The machine, an Apollo, is used to safely handle and collect the birds from the barn. Birds are then transported to the processing facility in covered trailers that have a top that raises up and

down for ventilation and a curtain that keeps wind chill off them in winter. In summer, mesh is used instead.

## Picking Up Litter?

Another part of the learning curve for Nebraska growers is using a new resource: poultry litter. Each broiler barn will produce about 1,200 tons of litter and will be cleaned out on an annual basis.

After each flock leaves, litter is windrowed in the barn, where it heats up to 140 to 150 degrees F, and breaks down solids and bacteria.

Windrows are turned several times and then spread back out to serve as insulation to chicks. The litter will be up to 6 inches deep across the floor of the barn, and the depth will be adjusted as manure is taken out. When a new group of birds comes in, wood shavings are spread back over the floor as a carbon base.

The value of that 1,200 tons of litter per year is about \$40,000 per year — on top of the annual income the birds provide.

## A Big Investment

A typical 20-acre, four-barn broiler site takes an investment of \$2.3 million to \$2.4 million. Costco provides a 15-year loan to cover the cost, while Lincoln Premium Poultry owns the chicks and provides all inputs needed except labor. On top of the manure value leaving the barns, the birds from a single site typically bring \$95,000 per year. Growers take part in a 15-year contract, and that contract guarantees a market and base pay for their birds and rewards those that go above and beyond.

“I don’t know any 20-acre piece of land that will do that,” Shafer says. “This brings the next generation home, and it solidifies that family farm that’s been on the land four or five generations.”

“Costco’s demand is growing every day and every year. I would like to think if we’re successful here, they could replicate this process, maybe here in Nebraska for a second plant,” he adds. “I emphasize we have to have the first facility up and running to complete all we said we would do. Right now, we need growers. We could use another 50 to 60 growers for 2019.”<sup>81</sup>

Costco Wholesale’s decision to bring chicken production in-house, if successful, will be a model for other retailers to follow, CoBank’s Knowledge Exchange Division said in a new report. CoBank is a \$131 billion cooperative bank serving agribusinesses and rural power, water and communications providers across the United States.

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<sup>81</sup> Harris, T. (2018). Eastern Nebraska gears up for poultry production. Retrieved from <https://www.nebraskafarmer.com/livestock/eastern-nebraska-gears-poultry-production>

We see the decision by Costco to bring its poultry supply in-house as a result of three primary drivers — surety of supply, visibility up the chain and cost control,” said Will Sawyer, lead animal protein economist at CoBank. “The ability to control the consistency of bird weights enhances food preparation and safety. Locating the facility in Nebraska also provides access to feed at favorable costs, a reliable water supply, and a comparatively advantageous labor market.”

### ‘C.R.C’

Costco’s rotisserie chickens have become a major driver of customer traffic at its warehouse stores, CoBank said, and in-house production is expected to save the company 10 to 35c per bird. Costco’s sales of rotisserie chicken have experienced 8% growth annually since 2010, which is three times the growth rate of total poultry consumption in the United States. During this time, the company has maintained a \$4.99-per-chicken price point, according to CoBank.

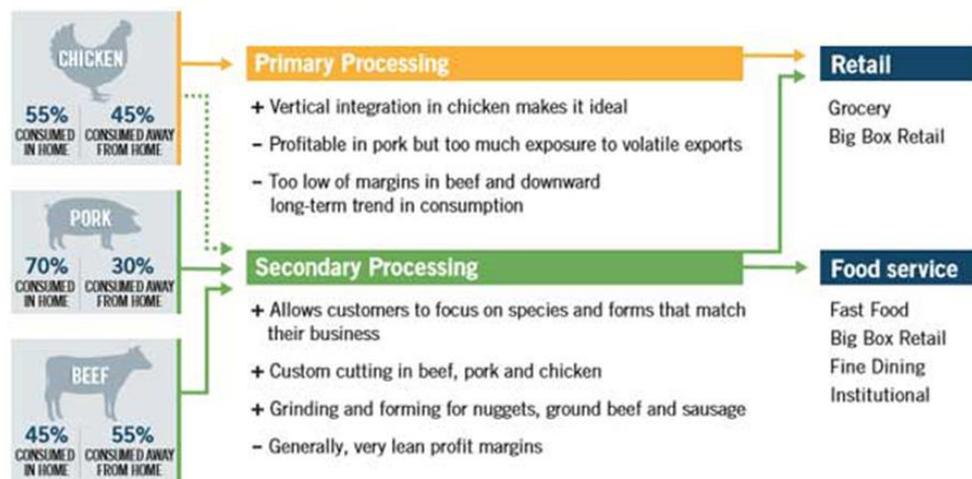
“...Costco’s rotisserie chicken is so popular with its customers that it has its own Facebook page with over 10,000 followers and is referred to as 'C.R.C.," CoBank said in its report. "This is a product among few others that serves as an important traffic driver for the retailer’s average store size of 145,000 square feet. The rotisserie chicken section is strategically placed at the back of the store.”

However, supplies of whole-bird chicken have declined — just 10% of poultry is sold as whole bird today, down 22% from 30 years ago, according to CoBank.

“Furthermore, as an increasing share of poultry is being sold as parts or further processed products, bird weights have continued to climb with less than a quarter of the birds raised in the U.S. today meeting Costco’s weight requirements of six to six-and-a-quarter pounds,” CoBank said.

The poultry sector presents the most appealing opportunity for retailers to build a fully integrated supply chain, Mr. Sawyer said. However, Costco’s approach in other protein sectors, such as beef and pork, could present significant

### Opportunities for new entrants into the U.S. meat sector



Source: CoBank

risks and challenges for retailers.

## An Eye on Supply Chains

“Food retailers will need to evaluate a number of risks in order to justify the investment of time and capital required to build their own production capacity,” Mr. Sawyer said. “Beef packers have historically yielded very tight margins, and with declining per capita beef consumption, the sector would be unlikely to meet its return objectives. Pork processing brings the risk of very large exposure to export market risks. Additionally, retailers will need to consider food safety risks, negative profitability in production and whole animal utilization to justify such investments.”

The retail industry will be watching closely Costco’s foray into poultry production, CoBank said, because if the wholesaler is successful, its competitors will start rethinking agricultural supply chains and business models.<sup>82</sup>

Costco chief financial officer Richard Galanti said the company was “willing to eat, if you will, \$30 to \$40 million a year in gross margin” by holding its rotisserie chicken prices at \$4.99 as competitors raised prices ahead of expected wholesale price increases in the wake of the avian flu epidemic.

But the company continually looks for new ways to shave its costs and ensure a steady supply, particularly as the availability of whole chickens meeting Costco’s weight requirements has dwindled; more birds are sold as parts or otherwise processed.

Galanti said last October that the \$300 million plant, which broke ground last year, will produce about 100 million chickens a year, about a quarter of the company’s annual U.S. demand.

“Costco’s plant will allow the company to target and remove costs to make the \$4.99 price point sustainable over the long-term,” Will Sawyer, lead animal protein economist at CoBank, which serves industries including agribusiness, said in a new report on Costco’s chicken play.

For example, Nebraska’s vast production of corn and soybeans should give Costco an advantage on feed costs, Sawyer noted.

By delving deeper into the chicken supply chain, Costco is following its own playbook with the hot dog, which it gets in staggering volumes from a plant it owns in Tracy, Calif., where it also produces ground beef. That’s part of how the company has [held the line on the combo price since 1983, this summer’s much-lamented demise of the polish dog option notwithstanding.](#)

Critics in Nebraska say Costco’s version of vertical integration offloads the financial risk to the chicken farmers with whom it’s contracting and environmental risks to the broader community.

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<sup>82</sup> Shaffer, E. (2018). New Costco Poultry Complex Initiates Ripple Effect in Retail. Retrieved from <https://www.foodbusinessnews.net/articles/12548-new-costco-poultry-complex-initiates-ripple-effect-at-retail>

But if Costco's chickens are indeed on the level of the hot dog in importance, the company will likely be motivated to take greater care with the supply chain.

Costco is "not just trying to competitively produce a food product," University of Nebraska agriculture economics associate professor Brad Lubben [told The Tribune](#), "it's also producing something that is fundamentally identified and recognized as their brand on display."<sup>83</sup>

## Decreasing Hatchability

Christine McCracken, an executive director at Rabobank, said decreasing hatchability rates is another issue challenging poultry companies' ability to increase production. The lower rates, McCracken said, are due largely to a transition in breeding among broiler producers to address changing consumer demands. "Part of it's been the move toward antibiotic free that's dramatically dropped the hatch rate by 2 percent to 3 percent over the past three years," she said

Increases in production and weights have helped offset some of the negative impact of the decreases in hatchability, but overall growth in production has remained basically flat while pricing has been favorable for processors, according to McCracken.

Consumption of meat and poultry in the US has been a trend that is hard to ignore and one that has many thinking it will relent. McCracken shared graphs illustrating a steady increase in protein consumption across the board, with annual chicken per-capita consumption leading the pack at over 230 lbs. for the past three years. But she questioned the sustainability of this trend.

"Really, how much more protein can the US consumer afford?" she asked. "A big part of why the US consumer has been able to absorb the additional production is because the economy has been on a roll," in terms of consumer income growth, soaring consumer confidence and low unemployment rates. However, she cautioned there are red flags appearing on the horizon, including historically high consumer credit card debt and record-high delinquency rates on car loans among US consumers. "I would say that generally, right now there are some signs that we might be nearing a top rather than a bottom," in terms of the US economy, she said.<sup>84</sup>

## Woody Breast a Hard Sell

Woody breast continues to confound the poultry industry a decade after its discovery. The condition does not harm the birds or cause them to act differently, and it does not harm people if eaten. It does, however, cause the meat tissue on chicken to become unusually tough, with a

<sup>83</sup> Romano, B. (2018). Costco takes rotisserie chicken supply chain under its wing. Retrieved from <https://www.seattletimes.com/business/retail/costcos-rotisserie-chicken-ambition-takes-shape-in-nebraska/>

<sup>84</sup> Crews, J. (2018). Pork, poultry industries face supply and labor challenges. Retrieved from <https://www.meatpoultry.com/articles/19603-pork-poultry-industries-face-supply-and-labor-challenges>

coarse texture - prompting complaints from consumers and leading to large amounts of affected poultry products going to waste.

The heavier the bird, and the larger the quantity of meat on it, the more likely it is to develop woody breast. While the condition can be found in leg meat, it typically affects breast meat, with enough impact to disrupt the supply chain.

Poultry production plants typically wait until each carcass has been de-feathered before allowing breasts to be touched by human hands, which increases the expense of the process and slows production. If the breast meat is found to be unusually hard, it indicates the fillet has woody breast, and the meat is moved into another supply chain, to be processed as ground chicken. The meat can then be used in chicken nuggets or other products that do not require a single piece of meat.

Chicken affected by woody breast is healthy to eat, but the texture is very different, says Dr. Casey Owens-Hanning, Novus International professor of poultry science at the University of Arkansas. In the laboratory, the condition can be detected in chicks as young as a week old, which suggests the problem might be genetic, says Dr. John Glisson, vice president of research at the US Poultry & Egg Association. The condition seems to be associated with vascular problems in the birds.

Broiler chickens have been bred to strengthen the genetic markers for large breast meat, and this is thought to be a factor in the development of woody breast in recent years. One indication of this is the Athens Canadian Random Bred, a broiler chicken that has been maintained since the 1950s for research purposes. Lesions indicative of woody breast are found in this heritage breed, but not to the extent of the typical modern broiler chicken. According to Glisson, selecting genes for growth and yield has caused breeders to inadvertently select for woody breast, too.

Dr. Owens-Hanning says reports of the condition have decreased, but she doesn't think it's because there are fewer instances of woody breast. Rather, people at the processing plants are getting better at identifying the condition and handling it before it gets to restaurants or consumers who would report it having been disappointed with the quality of their purchase.

## **Searching for a cause**

Owens-Hanning first started studying the condition in 2014 and has visited several processing plants to try to determine what causes the condition and to look for similarities between the birds that have it. Genetics remains a focus in the search for a cause, but other areas under scrutiny include the oxidation of proteins in muscles, the size of the fibre diameter and other vascular issues. In addition, it has been noted that many of the birds with woody breast have a decreased water-holding capacity and are slightly larger on the growth curve than other birds.

Woody breast was first reported to Aviagen in 2011, one of the world's leading primary-breeding companies for broiler chickens. Since then, its research and development team has been working to understand the cause of woody breast and how to mitigate its effects.

Studying woody breasts under a microscope, the Aviagen team has found muscle-fibre degeneration and active repair, an increased deposition of connective tissue and fat and an infiltration of immune cells – which are involved in both removing the degraded muscle cells and stimulating muscle repair. These changes indicate reduced oxygen levels in the muscles, which causes them undergo oxidative stress. This, in turn, results in insufficient levels of antioxidants in the chickens' breast tissue. Understanding the factors that impact oxygen and antioxidant levels in the muscle has been key to Aviagen's research, says Santiago Avendano, global director of genetics for the Aviagen Group. Everything from the birds' environment to vaccinations are being studied as possible causes and contributing factors.

The R&D team has also looked at the role diet and nutrition might play. Keeping birds on the recommended growth curve and within standard weight, ranges can help reduce the occurrence of woody breast. No dietary supplement has been found to reduce incidence of the condition in the field.

The condition has been seen globally across a wide range of genotypes, bird sizes, and genetic origins, and according to Aviagen's researchers, there is no evidence of any mutation having played a role in the condition.

Poultry workers, meanwhile, are getting better at detecting the condition by handling fillets. As a result, says Glisson, the affected cuts are being increasingly removed from the production line and data about how often the condition occurs has become unavailable.

## **Detectable Differences**

The US Department of Agriculture (USDA) has partnered with universities on several different research projects. In addition to studies attempting to identify what causes woody breast, research is being carried out to develop ways affected meat products can be spotted with technology. Rather than having someone touch each fillet, it might be possible to X-ray the meat or use electrical impedance measurement, a system that has been used in the fish and beef industries. A 2016 report by the US National Poultry Research Center found that different applications of imaging technology - optical coherence tomography imaging, hyperspectral imaging, Vis-NIR hyperspectral imaging, and 3D imaging - could differentiate between the muscle-surface characteristics of normal chicken and fillets affected by woody breast. Some of the methods examined had a greater than 95 percent accuracy. Additional research is to be conducted to fuse the different image-based technologies to increase accuracy.

Males and females from three modern broiler strains and the Athens Canadian Random Bred were studied in a 2017 report by the US Poultry & Egg Association and conducted by North Carolina State University: 'Factors Contributing to Superficial Pectoral Myodegeneration and

Sclerosis (“Wooden Breast”) in Broilers.’ The researchers found that woody breast impacted almost every bird they studied. The degree of severity varied, with the ACRB birds showing less severity than their peers at eight weeks old.

A report by the Department of Animal and Food Sciences at the University of Delaware confirmed the condition seemed to affect chickens growing faster on the growth curve than other birds. Heavier birds at one week old were more likely to have a predisposition to develop the condition.

Additional studies are ongoing and are focused on the effect of dietary glutamine and arginine on the metabolism, the possibility of a virus as the cause, nutritional strategies to reduce occurrences of the disease and developing a bioelectrical impedance index for the rapid detection of woody breast fillets.<sup>85</sup>

## Proso Millet

Nebraska joins Colorado and South Dakota as the three states that produce 90 percent of the proso millet in the United States. Proso millet is a warm season grass capable of producing grain between 60 to 90 days after planting. Because of its short growing season, proso millet has a very low moisture requirement and is capable of producing grain where other crops would fail. Proso millet is an excellent rotational crop and improves dryland wheat productivity. Proso millet is primarily grown in western Nebraska, with 111,000 acres harvested in the state in 2014.

Proso millet has the highest water-use efficiency of all cereals.

- Primary use of proso millet in the United States is in bird feed.
- For human consumption, proso millet can be used to bake flatbreads, make tabbouleh (an Arabian vegetarian dish), as a snack when popped, or even for brewing beer.
- In 2014, the proso millet crop in Nebraska was valued at \$10 million.<sup>86</sup>

## Soybeans

Soybeans are Nebraska’s second largest harvested crop. The most versatile of the major crops, soybeans can be grown in a wide variety of soils and climatic conditions. Consequently, soybeans are the most widely grown oilseed in the world. They often are used in rotation with corn because soybean plants return nitrogen back into the soil. The seed of the soybean plant—

<sup>85</sup> Why does woody breast still have the industry stumped? (2018). Retrieved from <http://www.thepoultrysite.com/articles/3802/why-does-woody-breast-still-have-the-industry-stumped/>

<sup>86</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

or bean—is processed for use in animal feed, human food products, and renewable fuel. Soybeans also are being used to make several industrial products.<sup>87</sup>

Nebraska ranks 5th in soybean production in the United States.

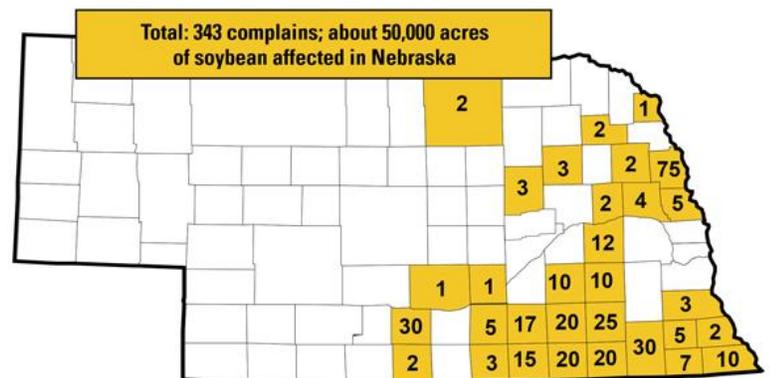
- Livestock and poultry in Nebraska used the meal from more than 24.5 million bushels of Nebraska soybeans.
- A 60-pound bushel of soybeans yields about 48 pounds of protein-rich meal and 11 pounds of oil.
- 1 bushel of soybeans can make 1.5 gallons of biodiesel.<sup>88</sup>

This year, nearly 500,000 acres in Nebraska were planted with dicamba-tolerant soybeans to apply some form of dicamba herbicide formulation, including XtendiMax from Monsanto, Engenia from BASF, and FeXapan from DuPont. As of July 19, however, roughly 25,000 acres of soybeans have been affected by dicamba injury in Nebraska — almost all of it due to volatilization. And that number has probably climbed to about 50,000 by mid-August, said Bob Klein, University of Nebraska Extension cropping systems specialist.

At a recent Soybean Management Field Day sponsored by Nebraska Extension and the Nebraska Soybean Checkoff, Klein noted there's the good, the bad and the ugly when it comes to using dicamba on soybeans. However, there's a good, bad and ugly on just about everything, he says. "For example, if we buy a boat, the good is you've got a new boat to go fishing. The bad may come if we buy a really expensive boat and hurt the family's finances. The ugly could come if someone wrecks the boat and gets hurt," says Klein.

In the case of herbicide injury, the bad comes from injury that's mostly cosmetic and doesn't result in a yield train wreck. The ugly comes when severe injury ruins a crop."On corn acres, we've sprayed quite a bit of dicamba in DiFlexx, DiFlexx Duo and Status, and those are lower rates, but normally go on corn a little earlier," says Klein. "There are some fallow acres, and there were some pretty high temperatures when those were being sprayed. All of those could or did contribute to the problem. However, I'm sure a lot of it was dicamba being sprayed in soybeans."

**DICAMBA INJURY IN NEBRASKA: This map shows the 343 complaints of dicamba injury in Nebraska this year, covering an estimated 50,000 acres — mostly in the eastern part of the state. This information was compiled by Amit Jhala, Extension weed**



<sup>87</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

<sup>88</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

**management specialist at UNL, with input from Extension specialists and educators around the state.**

Conventional soybeans may show cosmetic signs of injury but may not have a significant yield impact. University of Nebraska-Lincoln integrated weed management professor Stevan Knezevic recently tested injury levels in conventional soybeans, applying dicamba at V2 at  $\frac{1}{500}$  of the normal rate — equivalent to about a fifth of a teaspoon. Those soybeans saw 41% injury, but still yielded 68 bushels per acre compared to 75 bushels per acre on soybeans that had no injury. Beans sprayed later at the R2 stage saw only 13% injury, and yielded 73 bushels per acre, compared to 70 bushels on beans that weren't sprayed.

Many of the fields in Nebraska that suffered injury symptoms were consistently injured across the entire field, indicating injury due to volatility, meaning the herbicide is converted into a gaseous form due to high temperatures and carried into nearby fields. And Amit Jhala, Nebraska Extension weed management specialist notes, when it comes to volatility, "the herbicide could travel as far as a few miles."

The majority of volatilization can occur within 36 hours after dicamba is applied, but the role of temperature and other weather parameters to create temperature inversion are not well understood.

Jhala is in the process of working with UNL's High Plains Regional Climate Center to gather climate data on what some of the parameters may have been that resulted in dicamba injury this year.

"Some of the fields are now recovering, especially those that have plenty of rainfall or irrigation," Jhala says. "In some of the fields, it looks like it will mostly be cosmetic because the plants were reproducing pods and seeds. It's hard to tell if a certain field will have X amount of yield reduction."

While particle drift wasn't the primary cause for injury this year, it's still crucial to take steps to minimize chances of particle drift, Klein says. The No. 1 factor in drift is wind. And most dicamba labels require producers to apply at wind speeds from 3 to 10 miles per hour. That's why Klein recommends that growers who are spraying dicamba use a wind meter for smartphone. The device connects with Android and iPhone devices and can be used to record wind speed and direction and time at the boom height the operator is applying at.

Nozzle selection is another factor. Dicamba formulation labels require growers use a large particle size, and there are a few nozzles that meet this requirement. The label requires them to use the pressure that's on the label and the nozzle that's on the label.

However, when using a larger particle size, especially at a faster ground speed, it may be a good idea to use a higher carrier rate to improve coverage, Klein adds.

Of course, the benefits dicamba offers for controlling resilient weeds like Palmer amaranth can't be overlooked. Growers and industry representatives in the delta region, for example,

have reported the best control of Palmer amaranth they've had in 10 years with dicamba. "We want to get rid of the bad, but keep the good," Klein says. "We hope with some really good management and application stewardship that we can manage resistant weeds problems."<sup>89</sup>

## Lawsuit

A northeast Nebraska farmer has sued herbicide manufacturers, saying his neighbors' use of the company products damaged his soybean crop last summer.

The Lincoln Journal Star reported that Shane Greckel filed the federal lawsuit in U.S. District Court last week against Monsanto and other companies whose products contain the herbicide dicamba.

Dicamba, which kills broadleaf plants, including soybeans, has garnered a lot of publicity in the past few years due to its tendency to vaporize and drift to neighboring fields if not applied properly. The Environmental Protection Agency estimated that 4 percent of the nation's soybean crop was damaged by dicamba last year.

Greckel says in his lawsuit that's exactly what happened, as applications of dicamba by neighboring farmers led to "significant dicamba injuries on his crops, including, but not limited to cupping, curling, strapping, discoloration, leaf elongation, wrinkling, stunting, trumpeting, or twisting of exposed plants."

Greckel says in the lawsuit that at least 180 acres were affected in June and July of 2017. He farms near Bloomfield, located in Knox County and about 70 miles northwest of Norfolk.

Monsanto has faced a number of lawsuits over damage allegedly caused by dicamba, including a class-action suit in Missouri. Both Missouri and Arkansas have banned the use of dicamba after certain dates.

Monsanto spokesman Jeff Neu told the Journal Star that the company hadn't yet been served with the lawsuit but would review it.

Other defendants named in the lawsuit are BASF, DuPont and Pioneer Hi-Bred, all of which sell either herbicides containing dicamba or seed varieties that are resistant to it.

The lawsuit seeks an injunction against the companies to prevent them from continuing to sell products containing dicamba as well as actual and punitive damages and attorney fees and other costs.<sup>90</sup>

<sup>89</sup> Harris, T. (2018). Take steps to keep the good from dicamba, but prevent the bad. Retrieved from <https://www.nebraskafarmer.com/soybean/take-steps-keep-good-dicamba-prevent-bad>

<sup>90</sup> Bloomfield farmer files lawsuit. (2018). Retrieved from [https://www.theindependent.com/agriculture/bloomfield-farmer-files-lawsuit-over-dicamba-damage-to-crops/article\\_575fcc52-8c68-11e8-af9e-536fd92aedcf.html](https://www.theindependent.com/agriculture/bloomfield-farmer-files-lawsuit-over-dicamba-damage-to-crops/article_575fcc52-8c68-11e8-af9e-536fd92aedcf.html)

## Sunflowers

As sunflower growers look to a new growing season, it often helps to look back at the previous year as a potential indicator for concerns that may come up with the crop in 2017. There was very little insect pressure on sunflowers in much of Nebraska's Panhandle last season, according to Nebraska Extension entomologist Jeff Bradshaw.

"I did see some locations with high red seed weevil damage, but very little pressure from many other sunflower pests," Bradshaw says. "This year, if the winter continues to turn out relatively mild, we might expect high populations of sunflower moth migrating from the South if winter survival increases."

Bradshaw notes that there is evidence that some commercial sunflower seed varieties may have natural resistance to sunflower moth. "We are currently in the process of evaluating sunflower lines for resistance to sunflower moth," he says. "Some of our commercial varieties may have a high level of resistance."

Over the past several decades, researchers have typically recommended delayed planting dates for sunflowers to avoid some pests. "Our data now suggests that this often-used recommendation may no longer be valid," Bradshaw says. This is in part due to the generally lower populations of some of these pests that were around in the 1970s and 1980s when these recommendations were developed. Secondly, the use of effective insecticides during flowering is widespread and has done a good job at keeping pests in check.

On the disease side, Nebraska Extension plant pathologist, Robert Harveson, reports rust and Phomopsis stem rot as the major sunflower concerns in the Panhandle in 2016. He notes that both diseases showed up later this past season than in 2015. Pathologists also observed some Rhizopus head rot late in the season, due to hailstorms. This disease is opportunistic, according to Harveson, commonly striking heads after some form of mechanical damage from hail or insect feeding.<sup>91</sup>

## Trees

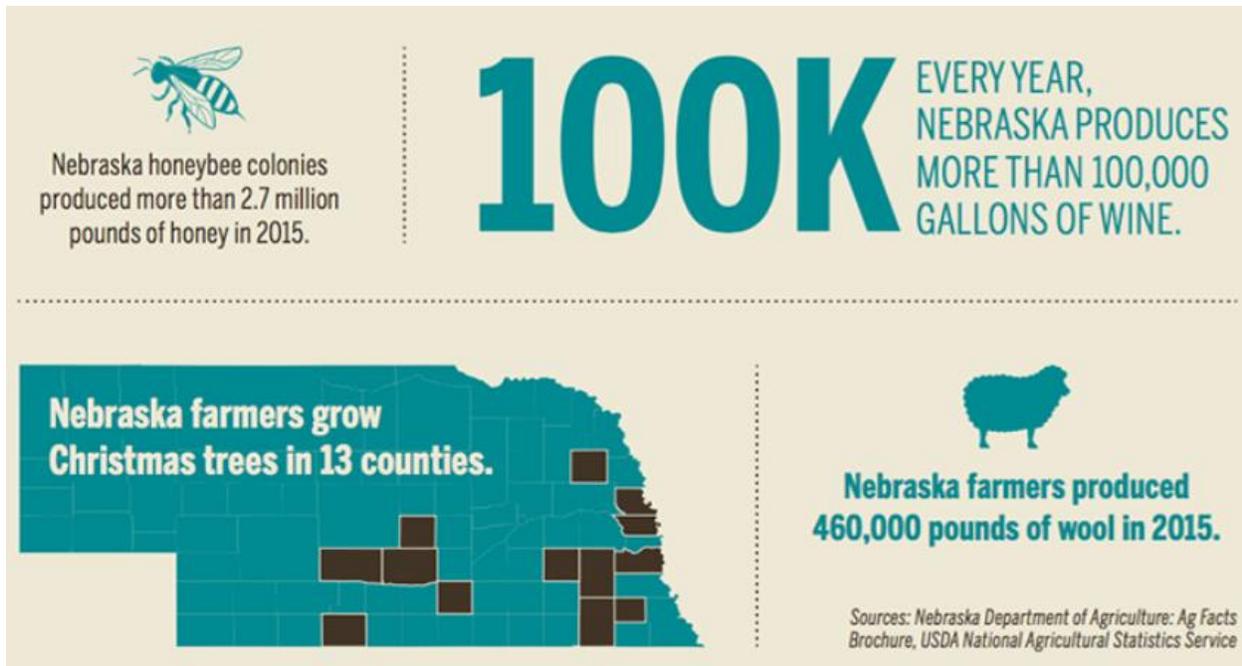
Each Christmas season, millions of trees are purchased from lots and tree farms across the nation. While they're growing, Christmas trees support life by absorbing carbon dioxide and emitting fresh oxygen. The farms that grow Christmas trees stabilize soil, protect water supplies and provide refuge for wildlife while creating scenic green belts. The trees are a renewable, recyclable resource that can be used for mulch in gardens and parks or be sunk into lakes to provide habitats and feeding areas for fish after the holiday season.

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<sup>91</sup> Arens, C. (2017). What's on radar for Nebraska's sunflower growers? Retrieved from <https://www.nebraskafarmer.com/crops/whats-radar-nebraskas-sunflower-growers>

There are approximately 15 “choose and harvest” farms in Nebraska. A typical operation is 3 to 8 acres in size.

- The top selling Christmas trees are Balsam Fir, Douglas Fir, Fraser Fir, Noble Fir, Scotch Pine, Virginia Pine, and White Pine.
- For every Christmas tree that is harvested, two to three seedlings are planted in its place.
- The average growing time for a retail Christmas tree is seven years.<sup>92</sup>



Source: <https://www.farmflavor.com/nebraska/nebraskas-top-10-agricultural-products/>

Thousands of Christmas trees cover 17 acres of well-manicured fields on Lincoln’s north side. Every year, hundreds of Nebraska families walk between rows of white pines and Canaan firs at Spilker’s Pineridge Tree Farm searching for just the right conifer to take home.

It’s a tradition that appears to be endangered.

The number of farms where folks can pick out a tree, have it felled and then strapped to the top of their car are dwindling.

Few new Christmas tree farms are sprouting while established ones are slowly disappearing as owners retire, pass away or sell out to land developers.

Growing Christmas trees takes time -- about seven years for a scotch pine and 10 years for a fir -- and hard work, Don Spilker, owner of Spilker’s Pineridge, said during a recent interview from

<sup>92</sup> Nebraska Agriculture. (2018). Retrieved from [http://www.nda.nebraska.gov/publications/ne\\_ag\\_facts\\_brochure.pdf](http://www.nda.nebraska.gov/publications/ne_ag_facts_brochure.pdf)

the Spilker's Pineridge sales building, which is filled with Christmas knickknacks, a wood burning stove and large containers full of hot beverages to help warm his customers.

Maintaining a tree farm means trimming, fertilizing, watering, mowing, business management and a love of Christmas. Few people looking to start a new business want to invest in tree stock and equipment when their first sale could be a decade off, he said.

Spilker and his wife, Linda, started selling Christmas trees in the 1970s. Back then, the Nebraska Christmas Tree Growers Association's had more than 50 members on its rolls. Today, its membership has dwindled to less than 20, said spokesman Dave Glass, who owns Pine Patch Tree Farm near Hastings. The Nebraska Department of Agriculture [lists 23 pick and harvest farms](#) in the state.

The number of Nebraska acres planted to Christmas tree production went from 1,068 acres in 2002 to 642 in 2012, according to U.S. Department of Agriculture's Census of Agriculture.

National numbers have seen a similar decrease. In 2002, the U.S. Farm Census shows, 14,677 producers harvested 20.8 million trees, while for 2012 the census reported 12,976 producers and harvested trees to 17.3 million.

For years, the average age of U.S. farmers has been going up while their numbers decrease. It's no surprise to find the same trend with Christmas tree farmers, said Rick Dungey of the National Christmas Tree Association.

Dungey sees plenty of room for growth in the industry, especially with apartment and loft dwellers through niche services like delivery and rentals of potted trees.

"Our industry is slowly but surely figuring out how to get those new shapes and sizes and species of trees on the market with new ways of getting them home," Dungey said.

"I don't think that is ever going to take away from the core customers. There is always going to be people who want to go out as a family and pick their special tree and make an event of it and have memories and that tradition."

U.S. consumers bought more than 33 million real Christmas trees last year worth \$1.16 billion and 14.7 million fake trees, worth about \$1.19 billion, according to the National Christmas Tree Association's annual consumer survey. Sales of real trees have hovered near or below 30 million annually for the past decade, with the exception of 2012, when numbers dipped to 24.5 million, which could be due to a variety of reasons, including a shortage of trees.

Nebraska tree growers, like many others in agriculture, saw tough times in 2011, 2012 and 2013. It started with an overly wet year in 2011. Christmas trees need well-drained soil to thrive. Overly moist soil will cause their roots to rot in the ground.

Then there was the drought and heat of 2012. Regardless of how often he turned on the spigot to water, Spilker said, the heat burned needles and killed trees both short and tall. Then came the harsh 2013 winter, which killed trees already stressed by a second dry year.

“We lost big trees. We lost like 7- or 8-foot trees,” he said.

For the first time, consumers in 2013 reported buying more trees at chain stores like Wal-Mart than at farms like Spilker’s, according to the association’s survey. Of those who responded, 27 percent bought a tree at a choose and harvest farm while 33 percent bought at a chain store and 22 percent at a retail lot, 8 percent at a nursery and 6 percent from a nonprofit group like the Boy Scouts.

Spilker expects his tree sales from his Lincoln farm to be down this year, but not for lack of customers.

“I’m going to be short on trees,” Spilker said. “There are a lot of people who are going to come out this weekend are not going to get a tree that they like or want. That really bothers me, but I can’t do anything about that.”

The majority of his customers come from Lincoln, but he also has sent trees off to decorate homes in Kearney, Grand Island, York, and Valentine.

Spilker said he typically sells about 800 trees each year, half of them grown on his farm and half imported from Michigan. His pre-cut trees are all first picks from the fields generally harvested only days before being sold, he said. But this year the number likely will be closer to 600 due to the high mortality rate of his own trees.

Spilker, who will be 83 next year, plans to plant 1,050 trees in the spring, a few hundred less than usual. Age is slowing him down, he said.

He’s not sure how much longer he will continue to sell trees, and not just because of the advancing years. He bought the acreage in 1972, well outside the city limits. But the city has expanded since then, and he believes it is only a matter of time before its borders absorb his property and bring higher taxes.

“You can’t afford to grow Christmas trees on (in town) commercial ground,” he said.

Spilker wants to pass the business on if he could find someone willing to start planting trees on their own ground a little further from town.

“I’d just hate to let all these people down that we have sold to for so many years. I’m afraid that time is going to come,” he said. “I’d love to help somebody, to get ‘em going because there is a good business here.”<sup>93</sup>

## Weather

Nebraska ranks in the top 10 states in production of several key crops — No. 3 for corn and No. 5 for soybeans. However, being located in the center of the continental U.S. — at the

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<sup>93</sup> Bergin, N. (2014). Endangered Tradition- Christmas Tree Farms Dwindle. Retrieved from [https://journalstar.com/business/local/endangered-tradition-christmas-tree-farms-dwindle/article\\_f2159d21-8443-522d-a504-137dadefcf41.html](https://journalstar.com/business/local/endangered-tradition-christmas-tree-farms-dwindle/article_f2159d21-8443-522d-a504-137dadefcf41.html)

confluence of the warm air moving north from the Gulf of Mexico and cold air moving east over the Rocky Mountains — Nebraska is a top state for major weather events such as tornadoes, severe thunderstorms, and hail. Insurance companies consistently rank Nebraska in the top 10 states for hail damage claims.

"Hail certainly is a 'hail' of a problem," says Ashley Mueller, disaster education coordinator and one of the Extension educators who created the website. "These events are significant, and we can't prevent them, but we can make producers more prepared when we have them."

With that in mind, a group of Nebraska Extension educators recently launched a new a series of online resources to help growers be prepared in the event of hail-damaged crops. This includes a new aptly named Hail Know website, which features a series of videos, infographics, and links to resources on hail-related topics. The site will be a sister site of the University of Nebraska-Lincoln's CropWatch site and is available at [cropwatch.unl.edu/hail](http://cropwatch.unl.edu/hail). While the name is catchy, it also lends itself well to Twitter hashtags.

"The idea came out of the significant hail events we saw in June 2014. As we looked at our response, we didn't have a good way to address everything consistently,"

Ashley says. "My idea was to consider how people get information these days. When growers make these hard decisions, do they want to read a five-page technical article? Probably not."

Meanwhile, the website breaks hail resources into several topics, including the initial hailstorm, damage assessment, crop insurance, and risk management, replanting considerations, managing plant recovery, and cover crops. This includes infographics and videos for each of these six topics — for example, a video highlighting various disease issues that can occur following a hail event.

Nathan Mueller, Extension cropping systems educator, says with more interest in cover crops in the last 10 years, they are a viable option after severe late-season hail events when replanting may not be worthwhile.

"Weeds, especially late-emerging ones like Palmer amaranth, can be a problem then, and a lot of herbicides aren't labeled for late-season," Nathan says. "When it comes to cover crops and insurance, the main thing is it needs to be a cover crop. You can't harvest it as a forage crop. You can't get paid out on a corn crop and then get a profit from a cover crop."



Hail events are typically sporadic, and damage is usually localized. That said, recovery can vary among different locations and different years.

Nathan says the Hail Know website helps growers understand these kinds of what-if scenarios following a hail event. "One question I get often is because of the frequency of hail events, the adjuster is busy, and I need to replant and get some coverage right away. Should I leave strips for the adjuster to evaluate the damage?" he says. "You need to have four rows wide by the length of the field for the first 20 acres, and another 10-foot strip for every 40 acres after that. Those are the kind of things you don't know unless you've experienced a hail event before."<sup>94</sup>

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<sup>94</sup> Harris, T. (2018). Hail got you down? Retrieved from <https://www.nebraskafarmer.com/disaster/hail-got-you-down>

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