Agriculture By the Numbers

November 2024

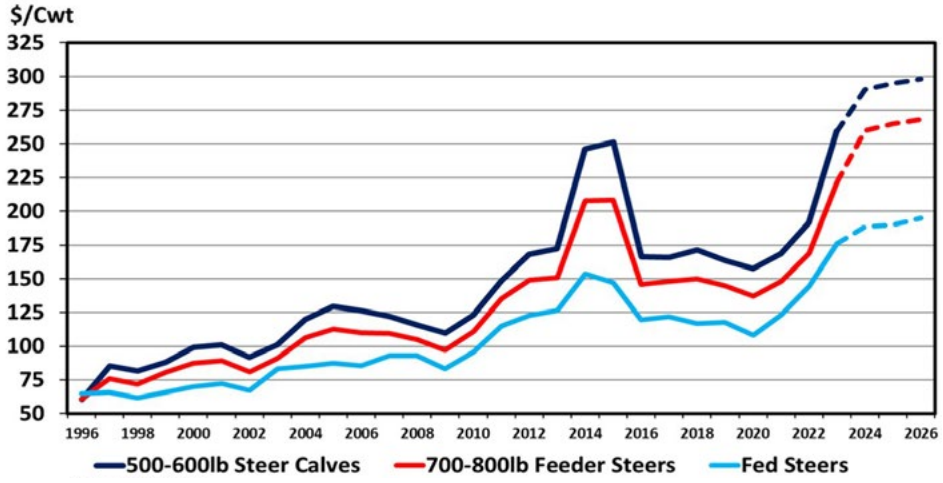
NDSU Extension Agribusiness and Applied Economics

Higher Fed Cattle Carcass Weights Buoy Beef Production

Tim Petry, Extension Livestock Marketing Specialist

Cattle prices have been increasing cyclically since the last cyclical price low in 2020. Prices have been supported by five years of drought-forced declining beef cow numbers. 2024 will likely be the sixth year of declining beef cow numbers.

Average Annual Cattle Prices



Source: USDA AMS

Even though beef cow numbers have declined, the beef industry continues to be adaptive and resilient at producing beef.

On a long-term basis, beef cow numbers have generally declined since 1975 with each cyclical high lower than the previous cyclical high. However, U.S. beef production has been on a long-term uptrend in spite of a decline in cow numbers.

The long-term increase in beef production resulted from an increase in fed cattle live and carcass weights. Carcass weights have trended higher for over 60 years with steer carcass weights increasing an average of 4 pounds per year. Steer carcass weights peaked in 2022 at 910 pounds but declined slightly to 908 pounds in 2023.

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Higher Fed Cattle Carcass Weights Buoy Beef Production

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U.S. beef production reached an all-time high of 28.29 billion pounds in 2022, buoyed by drought-forced beef cow liquidation. 2023 beef production declined to 27 billion pounds with fewer cattle available.

Each month, USDA predicts expected annual beef production for 2024 and 2025 in the World Agricultural Supply and Demand Estimates (WASDE) report. It is available at www.usda.gov/oce/commodity/wasde.

USDA's January WASDE estimate for 2024 beef production was 26.11 billion pounds, down 3.2% from 2023. However, USDA has increased the beef production estimate each month since due to increasing fed cattle carcass weights and more heifers on feed than earlier expected. The October WASDE beef production estimate was increased to 27 billion pounds, which is the same as last year.

That is one reason why fed cattle and feeder cattle prices are currently similar to last year. Remember, it is pounds of beef, not the number of cattle, that affect beef prices.

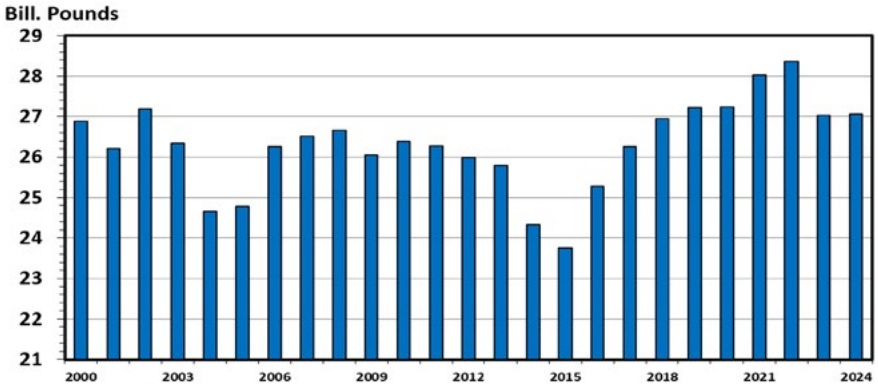
Feedlots are keeping cattle on feed longer due to the record high prices for the fewer available feeder cattle and lower feed costs.

And beef packers are encouraging higher weights to help bolster lower beef production levels because strong beef demand has resulted in near-record high choice beef cut-out values above $320/cwt.

With fed cattle prices currently averaging $190 per hundredweight (cwt.), costs of gain around $110/cwt. to $120/cwt., and fewer feeder cattle available, the incentive to add weight to fed cattle will likely continue.

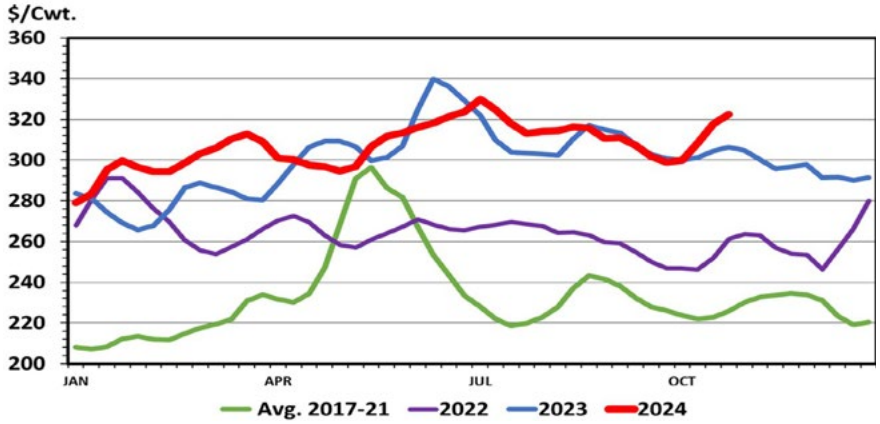
Fed steer and heifer carcass weights decreased seasonally the first five weeks of 2024 — the result of severe winter weather in December and January. But weights increased counter-seasonally and are at a record high over 940 pounds for steers and 850 pounds for heifers.

U.S. Beef Production — Annual



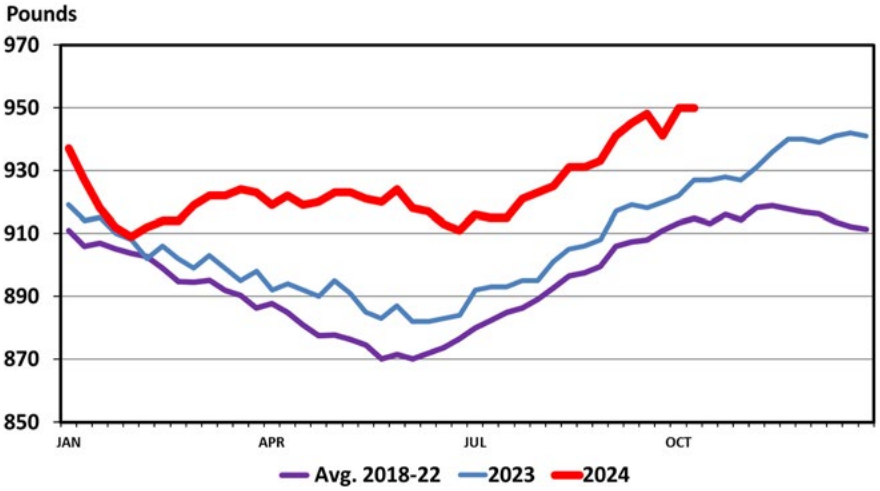
Source: USDA NASS & WASDE

Boxed Beef Cutout Value
Choice 600-900 lbs., Carcass, Negotiated, Weekly



Source: USDA AMS

Steer Dressed Weight — Federally Inspected, Weekly



Source: USDA AMS & NASS

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Higher Fed Cattle Carcass Weights Buoy Beef Production

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Carcass weights have been high enough to amount to about the equivalent of an additional 20,000 to 25,000 head of fed cattle slaughtered per week since February. If that pace continues for the rest of the year, increased weights may amount to near the 720,000 head decline in beef cow numbers that occurred in 2023.

Another variable that has increased beef production is the relatively high number of heifers on feed due to the drought conditions. USDA reported the Jan. 1, 2024, U.S. beef replacement heifer inventory at 4.86 million head was the lowest number since 1950.

An increase in beef replacement heifer retention would reduce beef production. But there are few signs of that happening yet.

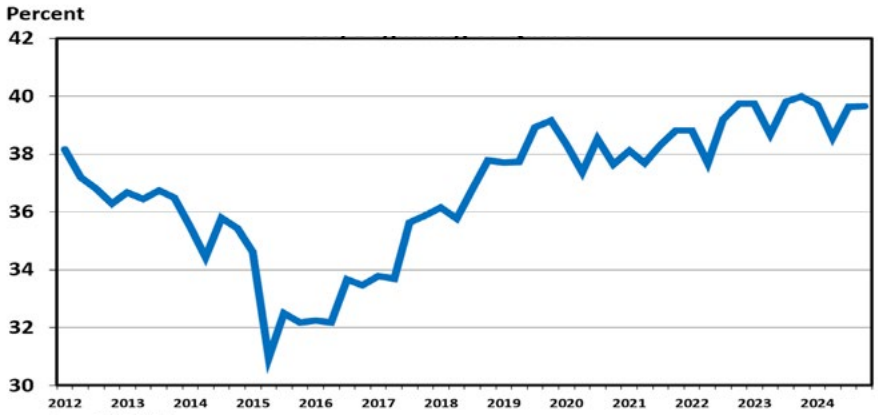
More beef replacement heifers are expected to be retained in the U.S. this fall, but drought conditions on a regional basis will dictate to what extent. Production cost inflation, elevated interest rates, remembering the rather abrupt decline in cattle prices after the last cyclical cattle price peak in 2014-15 and labor availability may also be obstacles.

Looking ahead to 2025, USDA is projecting beef production to decline 4% to 25.93 billion pounds, which would be supportive to cattle prices.

USDA projects fed steers to average $186.18/cwt. in 2024 and just slightly higher to $186.50/cwt. in 2025.

But there is a question if USDA will need to revise beef production upward like what happened this year.

Heifers on Feed as a Percent of Total Cattle on Feed
U.S., Beginning of Quarter



Source: USDA NASS

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What is an "Average" Year?

Byron Parman, Agricultural Finance Specialist

Anyone who has been involved in agriculture for long is aware that farm incomes are variable from year to year. This can be due to changes in domestic demand, international demand, supply side factors and market expectations. Similarly, production costs can and do change quickly, impacting net returns to producers across the U.S. and further clouding income expectations in the future. Regardless of the many factors, one thing we can expect is that whatever the situation is, it will change down the road.

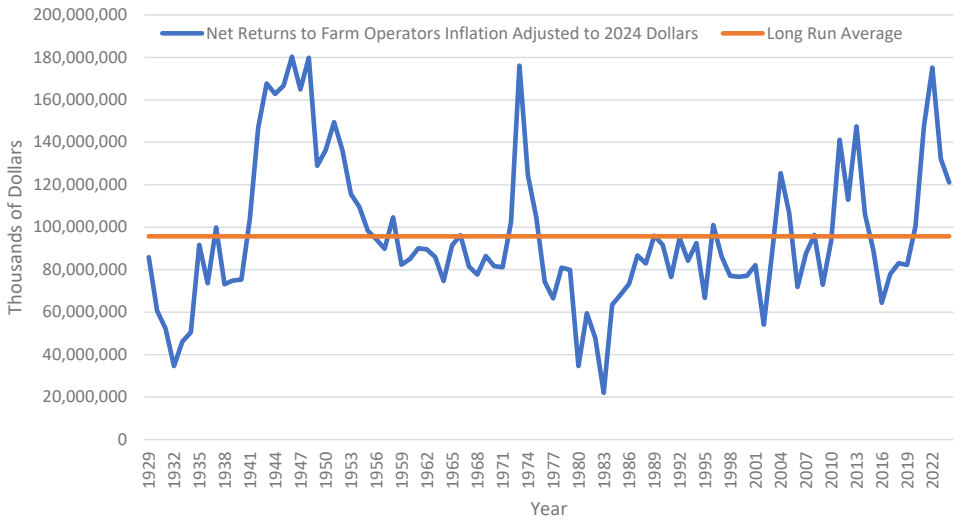
Figure 1 is a chart using USDA National Agricultural Statistics Service (NASS) data from 1929 to 2024 (2024 is projected) showing net returns to farm operators adjusted for inflation using 2024 dollars. The orange line shows the average net returns for reference. The numbers reveal some interesting points. First, there are far more years below the average than above. In fact, of the 95 years shown in that data, there are 36 years of net returns to operators above average, which is about 38%, meaning conversely that 62% of yearly net returns were below the long-run average, or nearly two out of every three years.

Does the fact that two out of every three years are below average imply that farmers have struggled? Not necessarily. The median net return to operators during that period is about $88 billion ,while the average is nearly $96 billion. This implies that peak net farm returns to operators are considerably high relative to the lows pulling the average up. In other words, the strong income years pull the averages up so high that years with returns that would be considered "most common" are below average. A good example of that would be the late 1980s and all of the 1990s. This period is not considered any kind of major agroeconomic downturn or depression, and yet only 1991 would be an above-average year.

On the other hand, the bust cycles, which are periods significantly below average with respect to net returns, are well documented and cause major economic hardship in agriculture. The Great Depression of the 1930s and the savings and loan crash from the late 1970s to mid-1980s saw many farms go bankrupt and several other associated agricultural industries ruined. Farm equity during those periods was completely wiped out for many operations, and several that did survive took decades to recover. In many ways, the big downturns in income have a much larger impact on the structure of agriculture than the strong net income periods.

Something this data appears to also indicate is that there are few "average years." Long-run agricultural financial decisions should anticipate cyclical downturns and later on future upswings. Long- run financial decisions certainly should not assume recent boom periods like 2021–2023 will continue without a subsequent multi-year reset similar to the 1940s, the 1970s and the 2010s. As long as those realities are anticipated and addressed when the opportunity arises, the health of U.S. agriculture does not need to rise and fall with the same frequency that net incomes do.

Figure 1: Net Returns to Farm Operators Inflation Adjusted to 2024 Dollars From 1929 – 2024



Data from USDA NASS: https://data.ers.usda.gov/reports.aspx?ID=17837#Pd33a10bf37244b27b54be216977957fe_3_96iT0R0x0

Data as of Sept. 5, 2024
F = Forecast values
NA = Data are not available/applicable.

Values are rounded to the nearest thousand. When Real (2024 dollars) is selected, nominal values are adjusted for inflation using the U.S. Bureau of Economic Analysis Gross Domestic Product Price Index (BEA API series code: A191RG) rebased to 2024 by USDA Economic Research Service.

1. Farm-related income includes forest products sold, machine hire and custom work, and other farm income.
2. Excluding expenses associated with operator dwellings
3. Including landlord capital consumption
4. Prior to 2008 estimates, net rent to landlords only includes the portion paid to nonoperator landlords.

Understanding the Role Logistics Costs Play in U.S. Export Sales

Frayne Olson, Crop Economist/Marketing Specialist

Previous Ag by the Numbers articles have talked about how important export sales are for U.S. corn, soybean and wheat prices. As domestic grain production and inventories increase, prices fall to stimulate more consumption. Reports of additional export sales are a strong indicator that U.S. prices are competitive in the global markets. U.S. export prices are impacted by the level of domestic supply and demand as well as logistics costs.

Most farm managers understand the impacts domestic supply and demand have on local grain prices, but they often overlook the role of logistics costs. Logistics costs include:

- Transportation costs needed to move grain from where it is produced to where it is finally consumed
- Storage costs needed to bridge the time differences between harvest and final consumption
- The profit margins for the companies providing storage and transportation services.

Table 1 provides a summary of costs for moving soybeans produced in eastern North Dakota to a port in China. Each row in Table 1 represents a unique "market" within the grain logistical system.

The starting point, in Row 1, is the closing futures market price for November Chicago Board of Trade (CBOT) soybeans on Oct. 30, 2024. The futures market is the common reference price used by all the companies that buy and sell soybeans in the cash market supply chain. Futures market prices can change rapidly depending on shifts in trader expectations about future supply and demand conditions and is the largest source of price volatility.

Row 2 is the cost to the local elevator, at a specific delivery time, for the soybeans delivered by a farm manager. This is the price, listed in both dollars per bushel and dollars per metric ton, that the farm manager is paid for their crop. This price is determined by adjusting the futures market price to reflect the local cash market conditions. This adjustment is called the basis. A more complete discussion of basis and how to interpret basis values will be provided in a future article.

Row 3 is an estimate of the fees charged by the local grain elevator to receive, grade, store and load the soybeans for delivery to the next owner. This value is an estimate made from data collected for alternative research projects conducted in the NDSU Agribusiness and Applied Economics Department. These fees are the gross margin for the local elevator. All operating and overhead costs must be paid from these fees. These fees can also vary considerably over time and by commodity.

Row 4 is the fee charged by a railroad for moving soybeans from Grand Forks, ND, to Tacoma, WA, by shuttle train. This represents the base cost for moving grain from the loading origin to the unloading destination. It is comparable to the mileage cost for renting a moving truck. It is referred to as the tariff rate within the rail transportation industry. This value was obtained from the Oct. 31, 2024, USDA Grain Transportation Report (GTR) (www.ams.usda.gov/services/transportation-analysis/gtr). The GTR is updated and published each week, and provides detailed price and performance information for truck, rail, barge and ocean transportation costs for U.S. agricultural products.

Table 1 – U.S. Export Price Estimates for Soybeans Grown in Eastern North Dakota and Delivered to China, October 30, 2024

Row	Soybean Logistics	Price/Bu.	Price/MT
1	Futures Price (Nov. CBOT)	$9.76	$358.62
2	Farmer Price (basis = -0.70)	$9.06	$332.90
3	Est. Local Elevator Fee	$0.25	$9.19
4	Rail – Shuttle Tariff Rate	$1.64	$60.43
5	Rail – Fuel Service Charge	$0.05	$1.80
6	Rail – Secondary Market	$0.35	$12.91
7	Est. Export Elevator Fee	$0.15	$5.51
8	**Est. FOB Price at PNW**	**$11.50**	**$422.73**
9	Ocean Freight – PNW to China	$0.79	$29.00
10	**Est. Total Cost & Freight**	**$12.29**	**$451.73**

Continued on page 6.

Understanding the Role Logistics Costs Play in U.S. Export Sales — continued from page 5

Row 5 is the fuel service charge added by the railroad to adjust for changing diesel fuel prices. The fuel service charge is correlated to the average price of diesel fuel and changes on a regular basis. The value used in Table 1 was also obtained from the Oct. 31, 2024, USDA GTR.

Row 6 is the cost for leasing a train in the secondary rail market. The secondary rail market allows companies that have a 12-month lease agreement with the primary railroad for the use of trains to sublease these trains to other companies on a short-term basis. The secondary rail market is often used by many local grain elevators to lease rail transportation when needed. It is comparable to the leasing costs for renting a moving truck. These rates can vary daily, depending on supply and demand conditions for rail freight for a specific delivery period. Values can range from several thousand dollars per car positive, during times of high demand like harvest, to hundreds of dollars per car negative, during times with low demand. The values in Table 1 were gathered from the Oct. 31, 2024, USDA GTR.

Row 7 is an estimate of the fees charged by an export elevator to receive, grade, store and load the soybeans onto an ocean vessel for transportation to the importer's receiving port. This value is also an estimate made from data collected for alternative research projects conducted in the Agribusiness and Applied Economics Department. These fees can vary considerably over time and by commodity.

Row 8 is a subtotal representing the Free On Board (FOB) price for U.S. soybeans loaded onto an ocean vessel ready to be delivered to an importer. There are several private agricultural information providers that report FOB grain prices at selected ports for a variety of grains. The estimated FOB soybean export price in Table 1 is $422.73 per metric ton. The average FOB soybean export bid at Pacific Northwest ports reported by AgriCensus on Oct. 30, 2024, was $423.00 per metric ton.

Row 9 is the cost for an ocean vessel to transport bulk grain from the Pacific Northwest to a port in China. This value of $29.00 per metric ton was obtained from the Nov. 1, 2024, Weekly Price Report published by the U.S. Wheat Associates. The cost is the average cost for a Panamax vessel, which is the most commonly sized vessel used for bulk grain shipments.

Row 10 is the estimated total cost for soybeans grown in eastern North Dakota to be delivered to a port in China. The importing company must add the cost to offload the ocean vessel and deliver the soybeans to their final domestic destination.

The estimated total cost and freight (C&F) in Row 10 of Table 1 is $451.73 per metric ton. Price data from AgriCensus for Chinese import bids to buy soybeans in the international market on Oct. 30 was $456.00 per metric ton. Because the import bid by Chinese buyers is very close to the estimated C&F price, a formal trade may or may not occur. We have not included the cost of insuring the ocean vessel and its cargo during the voyage across the Pacific Ocean. The price differentials are very small.

The key takeaway from this example is that international grain trading is a very complex and competitive process. Each row in Table 1 represents a separate market that is needed to trade and transport grain from the farm gate to an international buyer. Each of these markets has its own unique supply and demand conditions where prices change on a regular basis, which can influence sales volumes and the flow of grain.

For example, shifting ocean freight rates can impact the relative costs of delivering grain from the U.S. versus other exporting countries like Brazil, Argentina, Russia, Ukraine and Australia. Fluctuations in railroad freight rates can impact the relative costs of delivering grain from North Dakota to domestic buyers versus export facilities. And changes in Mississippi barge rates can impact the relative price of grain exported from the New Orleans, LA, ports versus the Pacific Northwest ports.

Seeing the breakdown of grain logistical costs can help farm managers better understand why export sales volume is a good indicator of U.S. price competitiveness and why cash grain markets are so sensitive to transportation costs.

Will there be enough corn produced in Richland County to accommodate a large dairy?

Jon T. Biermacher, Professor of Practice and Extension Livestock Development Specialist

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Corn is a major feedstock necessary to produce sugar, ethanol and milk. At present there are two large corn processors in Richland County. One is a corn wet milling processor (Golden Growers Cooperative) that grinds about 30 million bushels of corn per year. The other is an ethanol processor (Guardian Energy) that grinds about 50 million bushels per year. The total demand for corn from both large corn processors then is equal to about 80 million bushels per year.

To add to the demand for corn, a large (12,500 head) confined dairy operation is proposed to be built in Richland County near Wahpeton. The new dairy is expected to begin operation in 2027. This dairy is expected to purchase and feed to dairy cows somewhere in the neighborhood of 816,505 bushels of corn per year. In addition, there are additional demands for corn as feed in the area for other livestock enterprises, such as backgrounding calves; feeding cattle to slaughter weights; sheep production, poultry, swine and smaller dairies. However, total demand for corn from just these three entities is expected to be about 81 million bushels per year (see Table 1). To this point, some agricultural producers and stakeholders have asked if there will be enough corn produced in the county to support the expected need. And, if not, will that induce an increase in basis to encourage more corn production? These are fair questions that I address in this article.

Table 1. Expected Annual Use of Corn by Industry in Richland County, North Dakota

Industries that use corn	**Use** (bushels/day)	**Use** (bushels/year)
Guardian Energy (ethanol plant)	149,254	50,000,000
Golden Growers Cooperative (wet milling plant)	90,000	30,150,000
Riverview Dairy (planned for 2027)	2,237	816,505
Total demand for corn	243,752	80,966,505

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Will there be enough corn produced in Richland County to accommodate a large dairy? — continued from page 7

Table 2 reports the seven-year (2017-2023) average corn production (bushels/year) in Richland County and the seven counties surrounding it. The average production of corn in Richland County over the past seven years was 46.2 million bushels per year, which leaves, on average, a shortfall of about 34 million bushels per year (i.e., 80.2 million bushels minus 46.2 million bushels). Based on this information, farmers in Richland County do not typically grow enough corn to supply the needs of the two corn processing businesses in the county, let alone the other livestock enterprises, requiring them to import corn from outside the county, presumably from neighboring counties. In total, the eight-county region produces an average of 220.3 million bushels of corn per year, which is more than enough to cover the needs in the county, including the expected demand for corn from the proposed dairy. Because of the current shortfall in Richland County and corresponding local price of corn, I would argue that the addition of the expected new demand for corn (i.e., the additional 816,505 bushels per year) from the 12,500-head dairy will not have much effect on the local (regional) price of corn. However, this might not be the case when considering the demand and corresponding availability of corn silage, which is expected to be needed in a much greater quantity by the proposed dairy than corn and is likely to be much scarcer in Richland County and the region.

In the next issue of Ag by the Numbers, we will look closer at the demand and supply of corn silage in Richland County and the potential effects the proposed dairy might have on the price of corn and the decision to grow silage in place of corn grain in the region.

Please contact me with any questions you might have at jon.biermacher@ndsu.edu.

Table 2. Average (2017-2023) Production of Corn for Richland County, North Dakota, and Neighboring Counties

County, state, county seat	Production (bushels/year)
Richland, North Dakota, Wahpeton	46,171,714
Cass, North Dakota, Fargo	45,379,714
Ransom, North Dakota, Lisbon	16,001,500
Sargent, North Dakota, Forman	20,617,714
Clay, Minnesota, Moorhead	23,616,000
Traverse, Minnesota, Wheaton	23,779,857
Wilkin, Minnesota, Breckenridge	19,760,000
Roberts, South Dakota, Sisseton	24,985,167
8-county Region Total	220,311,667

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Talking Turkey, Giving Thanks

Tim Petry, Extension Livestock Marketing Specialist

When the calendar turns to November, thoughts may turn to Thanksgiving family get-together planning. At the forefront is a bountiful holiday meal that may include turkey. Included are abundant amounts of a variety of side dishes where many ingredients originate from a productive and diverse U.S. agricultural industry.

Dining room tables may also have beef, veal, lamb, pork, chicken or other poultry. A novelty Thanksgiving meat made famous by legendary sports broadcaster John Madden is turducken, which is a boned-chicken inside a boned-duck inside a boned-turkey.

Higher food prices have received considerable attention in the media the last couple years. However, turkey prices have declined from record highs during the COVID-19 pandemic and the 2022 highly pathogenic avian influenza (HPAI) virus that led to the loss of several million turkeys.

The U.S. Department of Agriculture's Agricultural Marketing Service (AMS) reported that whole turkey prices (national, whole hen, 8-16 pounds) are below average and will be similar to 2023.

The chart indicates a normal seasonal pattern to prices with a steady yearly increase until October, right before the peak Thanksgiving holiday demand. However, last year prices declined counter-seasonally the entire year.

Current prices at 99 cents per pound will be similar to last year at Thanksgiving, which were the lowest since 2019.

Most turkey hens are sold as frozen whole birds, with many placed into cold storage throughout the year until just before Thanksgiving. Toms are mostly destined for further processing and made into many consumer products such as breasts, legs, bacon, deli meats and ground turkey that are consumed year-round.

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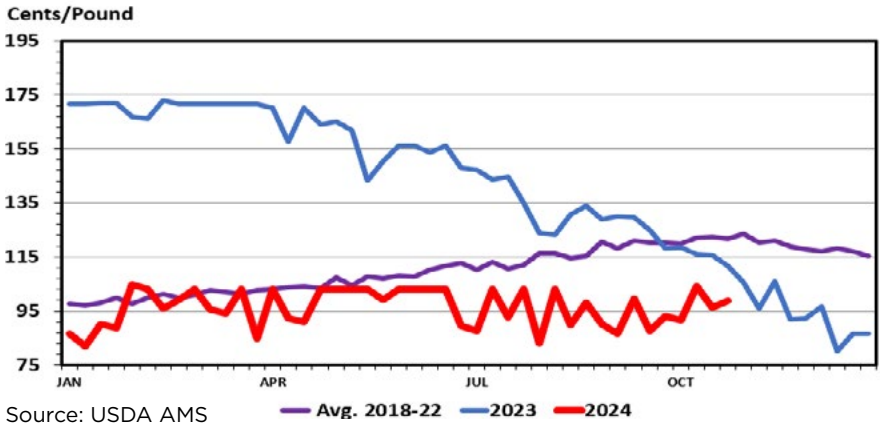
Turkey Prices
National, Whole Hen, 8-16 Pounds, Weekly



Source: USDA AMS

Talking Turkey, Giving Thanks — continued from page 9

The latest USDA National Agricultural Statistics Service (NASS) Cold Storage report released on Oct. 25 indicated a similar amount of turkey in cold storage compared to last year. So there will be plenty of turkeys available for consumers to purchase.

Wholesale turkey breasts prices at $2.00 per pound are down from the $2.50 per pound last year.

The U.S. is the world's leading producer of turkeys and turkey meat, and the world's leading exporter of turkey meat. In 2023, Mexico was by far the leading importer of U.S. turkey meat followed by Canada, Jamaica, Peru and Panama.

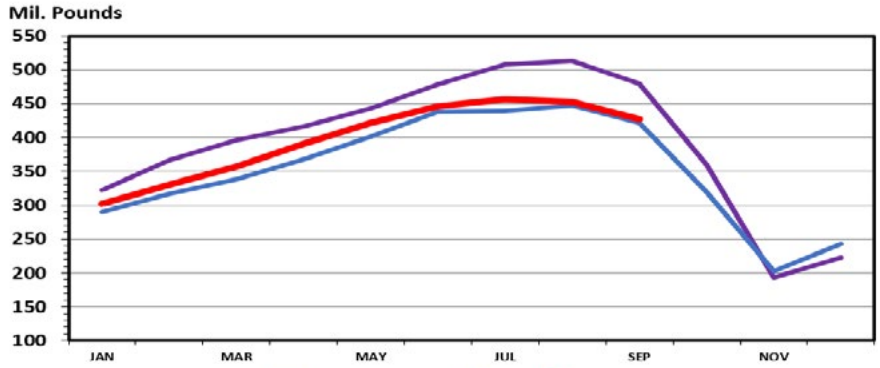
The U.S. is also the leading producer of beef and chicken, and second only to China in pork production.

Likewise, the U.S. is the leading exporter of high-quality beef and pork, and second only behind Brazil in chicken exports.

So the U.S. meat industry is important to the U.S. economy and livestock producers. Consumers also benefit from an ample, year-round supply of a myriad of meat product choices, especially at Thanksgiving.

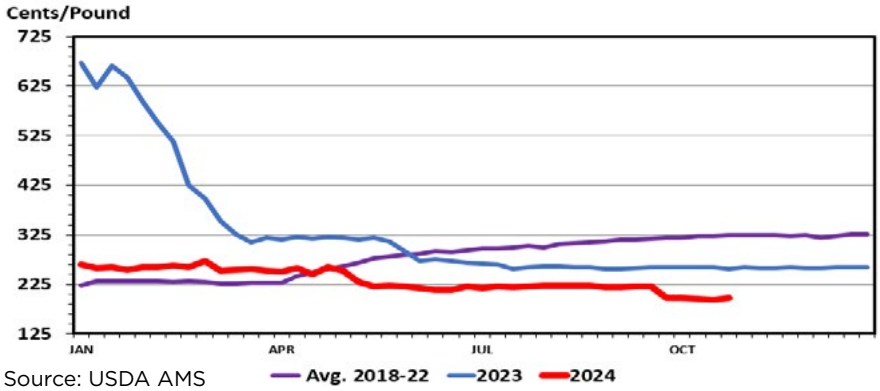
USDA is forecasting 205 million turkeys will be raised in 2024, down 6% from 2023.

Turkey in Cold Storage — End of the Month



Source: USDA NASS

Wholesale Turkey Breast Prices
National, Skinless/Boneless, Tom, Weekly



Source: USDA AMS

Minnesota is the leading turkey-producing state with 33.5 million birds expected to be produced in 2024. North Carolina ranks second with 27.5 million, and Arkansas is a close third with 25 million. South Dakota ranks 13th at 2.8 million. USDA does not publish North Dakota turkey production data, but according to the North Dakota Turkey Federation, about 1 million birds are produced annually on nine turkey farms in the state.

How much turkey do we gobble up at Thanksgiving? According to USDA, about 46 million turkeys are on Thanksgiving tables. U.S. per capita consumption of turkey has averaged about 16 pounds for the last 10 years, with 14.8 pounds consumed per person in 2023. USDA is estimating per capita consumption decreasing to 13.9 pounds in 2024 due to decreasing production.

Turkey prices have moderated, and consumers are likely to find bargains when shopping for Thanksgiving turkeys. Retail food stores may feature turkeys as loss leaders at below cost to lure customers into stores to purchase higher margin items that complete the Thanksgiving meal. Sometimes even local price wars emerge.

Even though other food item prices may be higher, we still have a lot to be thankful for. U.S. consumers enjoy the safest, largest quantity, lowest cost and most diverse food product line, including meat, in the world. Happy Thanksgiving to all of you.