

Long-Term Pressures and Prospects for the U.S. Cattle Industry

By Courtney Cowley

Cattle prices in 2021 have been recovering slowly from several disruptions—including a pandemic, two ice storms, and a cybersecurity attack—which have already had significant effects on profit margins for cattle producers. Although prices for all major agricultural commodities fell dramatically in the first half of 2020 due to COVID-19-related disruptions, most commodities rebounded sharply in the fourth quarter of 2020 and remained strong through most of 2021. However, despite a similarly sized fall, prices producers receive for cattle have only recently surpassed pre-pandemic levels. The sluggish recovery in cattle prices was reinforced by major winter storms in early 2021, which resulted in significant losses to affected producers, and a May 2021 cyberattack on meatpacker JBS S.A., which caused significant production delays. Together, these disruptions have limited the industry’s ability to recover from the pandemic and, alongside changing weather and consumer preferences, could have longer-term effects on the economic outlook for cattle producers moving forward.

In this article, I examine long-term pressures and prospects for the U.S. cattle sector. Going forward, U.S. cattle production faces three key pressures that may affect profitability: vulnerabilities along the supply chain; extreme weather conditions, particularly drought; and shifting demand from U.S. consumers. First, although cattle operations had

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been transforming prior to 2020 to produce more beef with fewer inputs, both the pandemic and the May 2021 cyberattack revealed that increasingly efficient, “just-in-time” beef production is highly vulnerable to supply chain shocks. Second, the intensity and frequency of extreme drought, which threatens herds and increases production costs, has only increased in recent decades and can be expected to continue posing risks to cattle production. Third, in addition to pandemic-related shifts in demand, demand for beef in the United States more broadly is under increasing pressure from other traditional meats and plant-based protein sources, especially as consumer prices for retail beef have experienced much larger increases in the pandemic aftermath than other food and meat categories. Although these pressures may shape cattle production in decades to come, growing international demand for U.S. beef—especially from emerging market economies—offers some prospects for the industry.

Section I provides an overview of cattle production and describes how supply chain transformations prior to and during the COVID-19 pandemic could continue to affect producer profitability in the longer term. Section II illustrates how severe weather events have affected cattle herd migration and producer profitability in the past and how increasing weather variability could affect the industry moving forward. Section III discusses trends in beef consumption relative to other protein sources, both in the United States and abroad.

I. Overview of the Cattle Industry, Supply Chain Evolution, and Recent Disruptions

The supply chain for beef is inherently more vulnerable to some disruptions than supply chains for other commodities due to how cattle must be raised and slaughtered. Moreover, the cattle industry has undergone changes in the past few decades that may extend the effects of short-term shocks into the longer term.

The beef supply chain begins with cattle production on cow-calf farm and ranch operations. After calves are raised to a weight of around 500 pounds and weaned, they are sold either directly to feedlots or to stockers or “backgrounders” who graze them on grass or wheat pasture to add another 300 pounds. “Feeder cattle,” or steers (male) and heifers (female), are finished on feed grains, legumes, silage, and distillers’ grains or

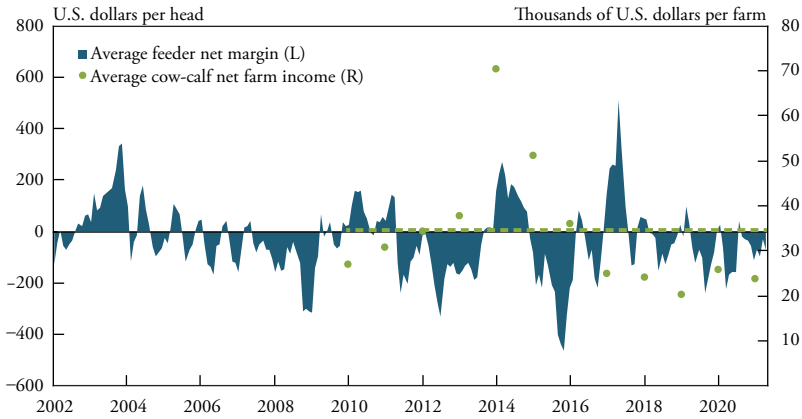
other byproducts, depending on the area and availability.¹ Once mature, cattle are sold to beef packing plants to be processed and packaged into primal cuts of meat. Processing plants add value by creating products that consumers can easily access, such as steak, ground beef, and frozen meals. Beef products are sold from the processor to the retailer at a wholesale price, then purchased by the consumer at retail. A single cow and its meat could be sold as many as six times before it finally reaches the consumer.

Net margins and farm incomes for U.S. cattle producers tend to be narrow. Chart 1 shows that since peaking in 2014, net income for the average cow-calf producer in the United States (in green) has declined notably and is projected to be \$23,700 in 2021, 32 percent lower than the previous 10-year average of approximately \$35,000. In addition, net margins for cattle feeders are calculated by subtracting the costs of finishing a steer from the price received from the packer when the steer is mature. Since January 2002, the national average for profit margins at feedlots (in blue) has been negative a majority of the time.

One reason for narrower profit margins in the cattle industry is that production costs are relatively high compared with other commodities. The primary costs associated with cow-calf operations are breeding livestock, land, rent, fuel, and hay. Although calves are an output for cow-calf operations, they are an input cost for stockers and cattle feeders (feedlots). Along with the prices cattle feeders pay for calves, corn accounts for about 50 percent of feed costs, and feed expenses can comprise 60–80 percent of total variable costs associated with finishing a mature animal. Higher feed costs track with higher total finishing costs, which often means tighter margins (assuming the price of cattle is constant over the short run).

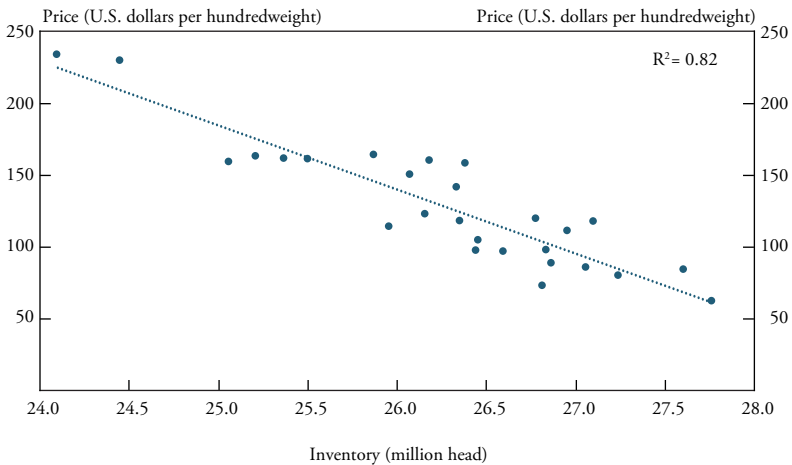
On the revenue side of profit margins, the prices cattle producers receive are highly correlated with supply—that is, the number of cattle produced in the United States. Chart 2 shows that over time, the relationship between feeder cattle inventories and prices has been linear and inverse, meaning an increase in inventories is typically correlated with a decline in prices. Since 1995, a 1 percent increase in inventories of feeder cattle in January has led, on average, to a 0.82 percent decline in annual prices for feeder cattle the following year. Over time, as supply chains have become more efficient, the relationship between supplies and prices for cattle has become increasingly important to monitor.

Chart 1
Average Profitability in the U.S. Cattle Sector



Note: Green dashed line shows average income from 2010 to 2020.
Sources: U.S. Department of Agriculture (USDA) and Iowa State University.

Chart 2
Feeder Cattle Prices and Inventories, 1995–2021



Sources: USDA and Iowa State University.

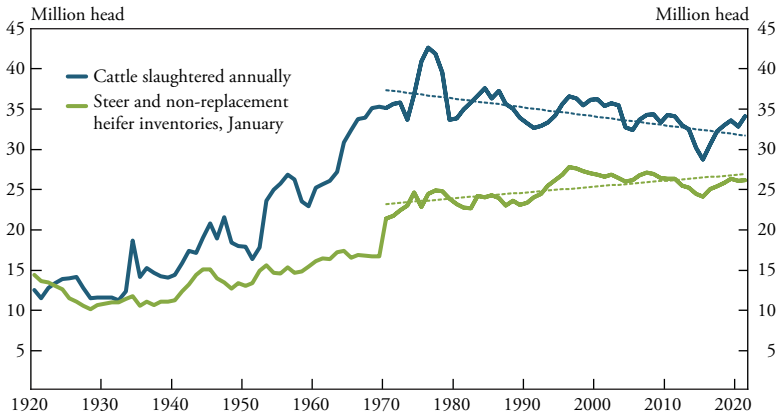
Greater efficiency in the supply chain means that meatpackers have been able to produce higher quantities of meat with fewer cows. Efficiency in the industry has resulted from a few key developments. First, on the farm, selective breeding and technologies such as artificial insemination and embryo transfer have made higher quality genetics available to all producers, helping the industry produce more beef per

cow. Despite a decline in the total number of cattle slaughtered, both the pounds of beef produced per head and the total amount of beef produced in the United States have increased. In fact, the number of pounds of beef produced per cow slaughtered nearly doubled over the last 45 years; in 2021, the total quantity of beef produced is projected to be a record 12.6 million metric tons. Second, the U.S. meatpacking industry started consolidating rapidly in the 1970s and 1980s (MacDonald and others 2000). Beef production and processing is expensive and capital-intensive, which has driven the industry toward economies of scale and fewer, larger firms that are able to operate and produce beef with lower marginal costs. Today, more than 70 percent of beef in the United States is processed at only 3 percent of U.S. meat processing plants (12 plants in 2019). The third development that has contributed to greater efficiency in the cattle and beef supply chain is the industry's transition to "just-in-time" inventory management, where cattle are shipped to packing plants and slaughtered just as soon as they reach maturity. Just-in-time inventory management attempts to match demand and supply and reduce excess capacity.

A more efficient supply chain will likely have longer-term effects on profitability for cattle producers. By concentrating cattle slaughter geographically, the costs of shipping cattle to processors increases with the distance from the farm to the plant, and processors may be able to mark down cattle prices because they have access to larger numbers of animals over a greater geographic area. Moreover, greater efficiency at slaughter has reduced demand for cattle even as supplies of steers and heifers have increased. Chart 3 shows the total number of cattle slaughtered at commercial meatpacking plants each year (in blue) and inventories for steers and non-replacement heifers, or heifers not kept on the farm to reproduce (in green). Earlier in the twentieth century, both inventories and slaughter numbers increased. In fact, from 1950 to 1970, the pace of increase in slaughter capacity seemed to outpace growth in steer and heifer inventories. However, since 1970, total slaughter capacity for cattle in the United States has declined. Overall, the number of cattle slaughtered each year declined from a peak of 43 million in the 1970s to around 30 million in recent years while inventories of steers and non-replacement heifers have increased slightly. In fact, due in large part to disruptions in 2020, monthly cattle-on-feed reports from February to

Chart 3

Transition to a More Efficient Supply Chain



Notes: Cattle slaughtered for 2021 projected based on number of animals slaughtered year-to-date in September 2021.

Blue and green dotted lines show trends from 1970 to 2020.

Sources: USDA and Iowa State University.

June 2021 showed fed cattle inventories (of which steers and heifers make up a large majority) to be the second highest since 1996.

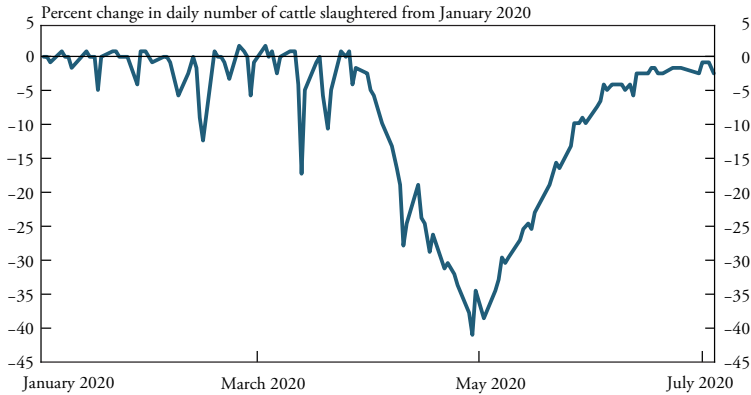
The transition to a more consolidated and efficient supply chain may have made both producers and consumers more vulnerable to shocks. First, when an increasing share of beef production is concentrated among fewer plants, any one plant shutdown becomes more disruptive to the supply chain. Second, when less excess slaughter capacity is available in the system, backlogs take longer to work through and can put downward pressure on cattle prices for a longer period.

Indeed, starting in March 2020, a series of disruptions led to processing backlogs and surplus cattle on farms. First, COVID-19 outbreaks at meatpacking and processing plants across the country forced plants to shut down or slow operations. Amid shuttered plant operations, the number of cattle slaughtered declined by as much as 40 percent in May 2020 (Chart 4, Panel A). Reduced demand due to the pandemic-related plant shutdowns created backlogs in the beef supply chain and led to surplus cattle on farms—the cumulative oversupply of cattle in the supply chain may have been up to 500,000 head (Cowley 2020). Together, these supply shocks put substantial downward pressure on live cattle prices and producer profitability.

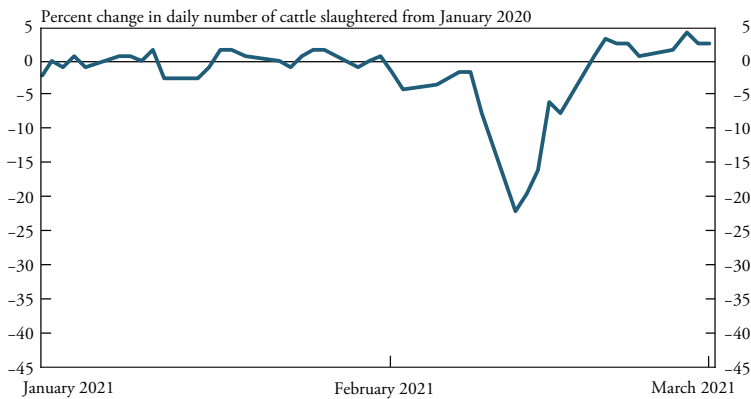
Chart 4

Disruptions in U.S. Beef Production, 2020–21

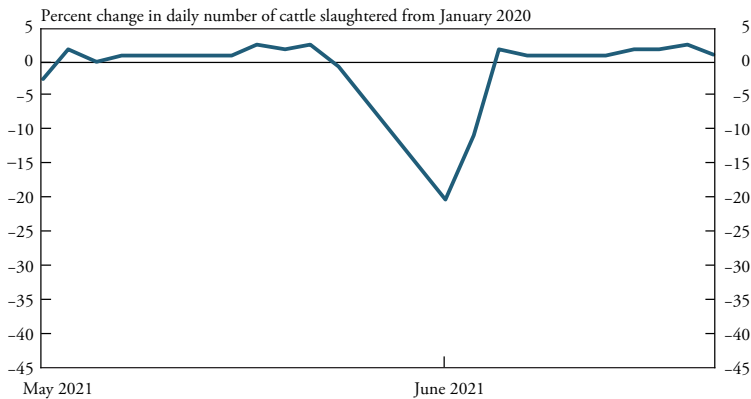
Panel A: COVID-19



Panel B: 2021 Winter Storms



Panel C: Cyberattack at JBS S.A.



Sources: USDA and author's calculations.

As the cattle industry was addressing pandemic-induced backlogs, two other shocks further disrupted beef supply chains. In February 2021, extreme winter weather across the United States affected a large share of the beef cattle herd. Snow and ice storms were so severe in some areas that packing plants were forced to shut down or reduce operations. Winter storms Uri and Viola reduced slaughter capacity and beef production by as much as 22 percent in the following two weeks (Chart 4, Panel B). And on May 30, 2021, one of the largest meatpackers in the country, JBS S.A., suffered a cyberattack that stalled its beef and pork packing plants. Total U.S. beef production was 20 percent lower on June 1 and 11 percent lower on June 2 compared with levels at the beginning of the year (Chart 4, Panel C). Although the cyberattack was short-lived—and the timing just before the Memorial Day holiday likely limited its effects—the size of the decline in total U.S. beef production shows just how concentrated meat production has become.

The trend toward consolidation is not unique to beef producers, of course, and the pandemic and weather-related shocks weighed on all livestock producers. However, supply disruptions can be disproportionately challenging for beef producers due to slower production cycles, less support from exports, and higher recent inventories for cattle on feed. Indeed, due in part to both continued disruptions and difficulty unwinding backlogs, cattle prices remained below pre-pandemic levels for most of 2020 and 2021. In August 2021, prices for mature cattle reached pre-pandemic levels, remaining flat through September even as prices for other commodities were 20 to 40 percent higher than pre-pandemic levels. Cattle prices moved above pre-pandemic levels in October and November 2021, but the increase has not yet been as large as upward price movements for other commodities.

Compared with other species of livestock, the biology of cattle production makes backlogs more difficult to work through. It takes about three years from the time a cow is bred for her offspring to be marketed for slaughter, and a cow has only one calf per year. Comparatively, a sow can have about 25 piglets per year, and a hen can lay up to 250 eggs per year. Sows and hens have much shorter life cycles as well, allowing hog and poultry producers to ramp up or reduce production more quickly in response to price movements in the market and disruptions in the supply chain. Because cattle are produced on longer production

cycles, shocks and backlogs in the supply chain can take longer to work through and have more lasting effects on prices.

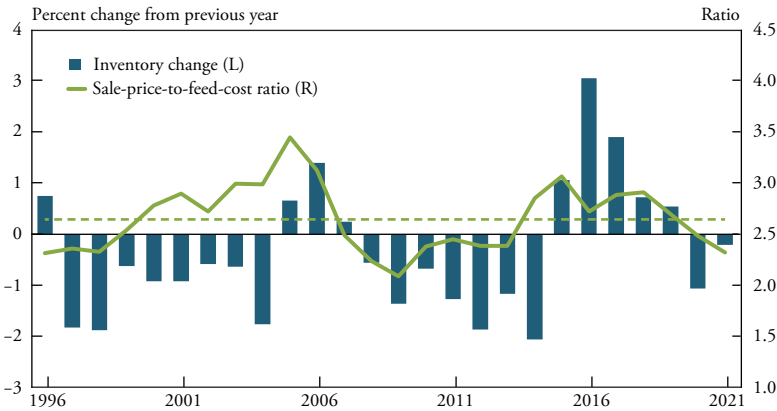
In addition to slower production cycles, the cattle industry is also less dependent on exports than are other commodities. Over the past decade, the United States has exported only about 10 percent of beef produced compared with 15 percent of corn, 25 percent of pork, 47 percent of soybeans, and 50 percent of wheat, on average. Although exports were likely not a drag on prices for beef, they did not provide the level of support experienced by markets for other commodities.

Cattle prices also have been slow to recover because cattle markets typically move in longer-term cycles. As producer profitability increases, cattle herds expand, increasing overall U.S. inventories. When profitability declines, producers begin to liquidate, and U.S. cattle inventories decline. Chart 5 shows my estimate of producer profitability using a sale-price-to-feed-cost ratio, where sale price is the average for live cattle, and feed costs are the average total costs of feeding a 1,500-pound steer to maturity. The average ratio of 2.6 means that, on average, the price producers receive for a finished animal is roughly 2.6 times larger than the associated feed costs. Since 1996, U.S. cattle inventories have never expanded in the year following a below-average price-to-feed-cost ratio. Although inventories have declined in five of the last 24 years following above-average profitability in the cattle sector, these years typically correspond to general economic recessions. The remaining 19 years show a notable positive correlation between U.S. cattle inventory changes and producer profitability in the previous year. In other words, cattle inventories typically increase the year after producer profitability increases (an increase in the sale-price-to-feed-cost ratio) and decrease the year after producer profitability declines.

However, cattle inventory movements in 2020–21 appear to have bucked this trend, which could add longer-term pressures to profit margins. In 2020, the price-to-cost ratio fell below average levels, but total cattle inventories in 2021 have thus far declined at a slower pace than in 2020 and at a slower pace than expected based on previous trends. Based on the historical trend, I estimate the change in total cattle inventories in 2021 using the 2020 price-to-feed cost ratio. In 2020, the ratio was 2.3, which would have led to a 1.25 percent decline, on average, in herd inventories going into 2021. As of January 2021,

Chart 5

U.S. Cattle Inventories and Price-to-Cost Ratios



Notes: Cattle inventories are total cattle inventories in the United States, including cows, calves, bulls, steers, heifers, and cattle on feed. Dashed green line shows the average sale-price-to-feed-cost ratio from 1996 to 2021. Sources: USDA and author's calculations.

however, inventories had only declined 0.2 percent from January 2020, indicating that half a million more cattle were on U.S. farms coming into 2021 than would have been expected based on 2020 producer profitability. Currently, cattle inventories would need to decline a bit more in 2021 for the industry to see improvement in profitability and prices in future years. Higher-than-expected inventories may have kept prices for cattle below pre-pandemic levels for a longer period.

Cattle inventories may have declined by less than expected in 2021 for at least two reasons. First, as discussed, supply chain disruptions in 2020 and 2021 reduced demand at packing plants and left many farmers and feedlots with limited options for moving and selling cattle. In addition, tight labor markets and the efficient, “just-in-time” nature of the beef supply chain means packing plants have had limited ability to ramp up production to work through backlogs more quickly. Therefore, producers were having difficulty finding placements for finished cattle and culled cows.

Second, government payments provided substantial support to farm finances in 2020, reducing producers’ incentives to cull herds. Government programs typically focus on support for crop producers, but in 2020, livestock producers received the largest share of the \$16 billion in funds provided by the Coronavirus Food Assistance Program

(CFAP). Support from the government may have helped producers maintain herd sizes at higher levels than current market conditions would normally support, thereby limiting herd liquidation and depopulation. Although these payments have supported farm finances in the short term, the higher supply of cattle could keep prices lower than they would have been over the next few years.

Producers are likely to feel the effects of the pandemic and concurrent shocks for several years. Disruptions and reduced capacity at meatpacking plants caused a surplus of animals on farms, which put downward pressure on prices and revenues. In addition, these disruptions could have longer-term effects due to previous trends of greater consolidation and efficiency in the industry. In fact, current long-term projections for livestock revenues, of which cattle make up a large share, remain below pre-pandemic levels (FAPRI 2020). Livestock revenues for 2020 came in 7 percent below levels forecast prior to the pandemic. In 2021, forecasters revised their 10-year projections for farm revenue down 3 percent relative to projections made in February 2020. With production costs expected to increase, producer profit margins may tighten even further over the next decade.

II. Drought and the Cattle Industry Moving Forward

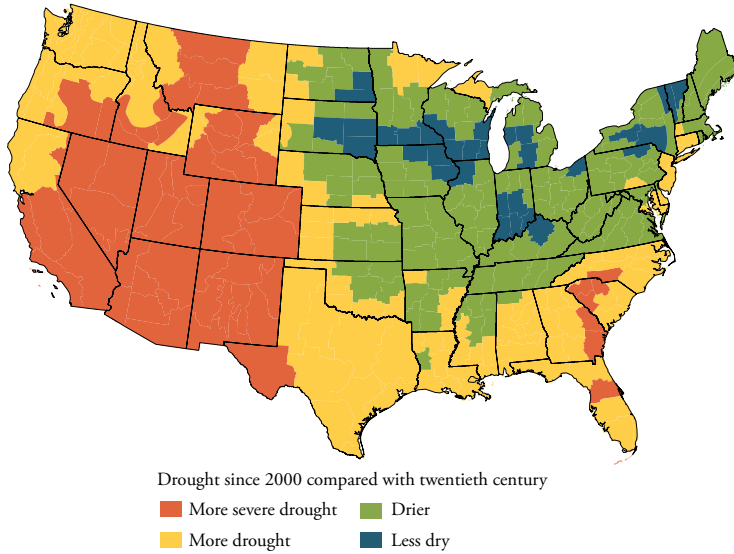
In addition to supply chain difficulties, increasingly severe and variable weather conditions could have greater effects on cattle production and producer profitability in the future. Although several forms of severe weather—including ice storms, hurricanes, and floods—can disrupt supply chains and create financial difficulties for local cattle producers, drought is likely to put the most widespread pressure on the cattle industry in the coming decades. Panel A of Map 1 shows that drought has occurred with greater intensity and frequency since 2000 than throughout the twentieth century, particularly in the West and Southeast. In the Southwest, drought has been more severe than in previous decades, with hotter temperatures alongside lower precipitation for a longer period. West of the Rocky Mountains, 16 of the last 20 years have been in some level of drought, and 11 of the top 20 driest years on record have occurred since 2000.

Drought has historically influenced herd management decisions and cattle inventories. Since the 1970s, U.S. cattle inventories have

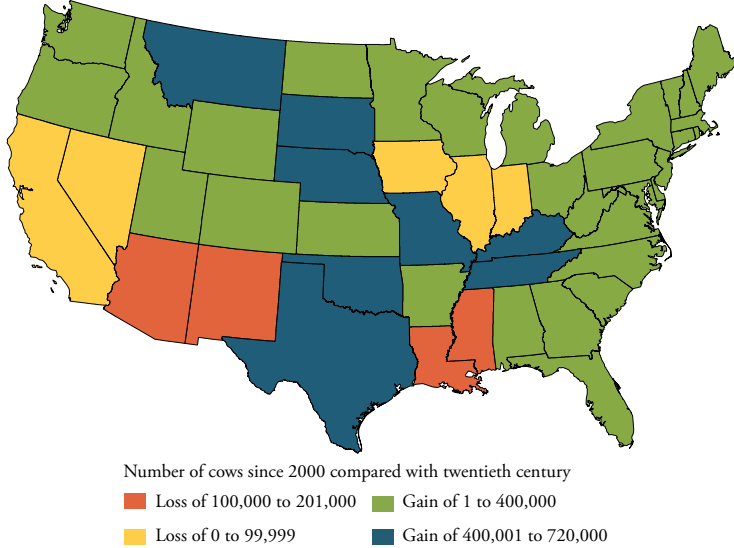
Map 1

Drought Intensity and Herd Migration in the United States

Panel A: Drought Intensity



Panel B: Change in Beef Cow Inventories



Sources: National Oceanic and Atmospheric Administration, USDA, and author's calculations.

declined in each year where at least 20 percent of the country was in severe-to-exceptional drought.² In 2011, for example, a drought began to spread across the contiguous United States; by early 2012, all lower 48 states were in some level of drought or abnormally dry, and more than one-third of the country was in severe-to-exceptional drought. The drought was especially severe in the Southern Plains, where a majority of the U.S. cattle herd is located, and by June 2012, U.S. cattle inventories had declined to the lowest levels in 60 years.

In addition, drought has had a significant effect on where cattle inventories are concentrated around the country. Panel B of Map 1 shows that in the last two decades, beef cow numbers have declined notably in the Southwest but increased in other states, particularly Missouri, Nebraska, and Oklahoma, which accounted for a large share of the overall increase in beef cow inventories. Although many factors could influence cattle production across states and regions—such as policy, culture, industry composition, and land quality and availability—drought has been notably less prevalent in most of the states that have experienced increased beef cow numbers. More recently, severe-to-exceptional drought has spread through much of the western and northern United States, and as of the beginning of 2021, cattle inventories had declined in states where 50 percent or more of the land area had been in severe-to-exceptional drought at the end of 2020.

Drought can affect producer profitability by putting downward pressure on revenues and upward pressure on costs. Farm revenues are determined by the price and quantity of cattle sold. Because drought can contribute to losses of pasture and forage, producers may be forced to sell a larger share of their herd in a drought year than planned. If conditions are so severe that producers must sell breeding stock, then drought-induced liquidation may also reduce potential future revenues.

Severe weather can put upward pressure on production costs as well. Abnormally dry or wet conditions limit grass and forage production. When grazing is not sufficient to meet the dietary needs of cattle, cow-calf producers must supplement with hay and other feed. Hay and pasture maintenance costs can account for 30 to 75 percent of total production costs on cow-calf operations and tend to increase in years of extreme weather events. Since 1975, hay prices have increased in all years with some level of drought, while wet years tend to put downward pressure on hay prices unless they are extreme enough to limit hay pro-

duction or reduce hay quality. In drought years, less hay is produced in areas experiencing drier-than-normal conditions, which reduces feed supply. At the same time, demand for hay may increase in dry areas, and producers may have to purchase hay from sources farther away, thereby driving up transportation costs.

Because drought can affect both farm revenues and costs, it can also have a notable effect on farm finances and agricultural credit conditions. In fact, since 1980, the total economic losses from 28 drought events have totaled \$262 billion, and the 2012 drought in the Southern Plains was the third most costly natural disaster on record for the United States (Smith and Matthews 2015). In the first quarter of 2021, agricultural lenders who respond to the Tenth District Survey of Agricultural Credit Conditions were asked to assess the overall change in the financial condition of borrowers that rely on crops as inputs (such as cattle, hog, poultry, and dairy producers) relative to one year ago.³ Respondents indicated that the financial conditions of farm borrowers had improved at a majority of banks across the region, but less so for livestock producers and producers affected by drought. Improvement was notably slower in Oklahoma and the Mountain States (Colorado, New Mexico, and Wyoming), where drought was more severe and widespread. Overall agricultural credit conditions were also weaker in areas experiencing more widespread and severe drought (Cowley and Kreitman 2021). For example, although farm income and farm loan repayment rates grew in almost all states in the first quarter of 2021 relative to 2020, incomes and repayment rates grew at a much slower pace in the Mountain States and Oklahoma. Although loan demand grew at a faster pace in areas affected by drought, rangeland values were expected to grow more slowly in dry areas.

In the decades to come, drought is likely to worsen in intensity and frequency in some areas, which would put additional pressure on profit margins, particularly in areas where water is already scarce. According to the National Climate Assessment, rising temperatures, extreme heat, drought, wildfire on rangelands, and heavy downpours are expected to increasingly disrupt agricultural productivity in the United States. Projected increases in extreme heat conditions are expected to lead to further heat stress for livestock, changes in water and forage availability, and disease and pest outbreaks, which can result in large economic losses for producers (NCA 2017).

III. Evolving Domestic and International Demand for Beef

In addition to supply chain shocks and extreme weather, a third concern for the U.S. beef industry over the last two decades has been growing consumer preferences for chicken and pork and increasing demand for alternative meat and protein sources. Although domestic demand for beef may be shifting, international demand—especially in emerging economies—offers prospects for U.S. beef producers.

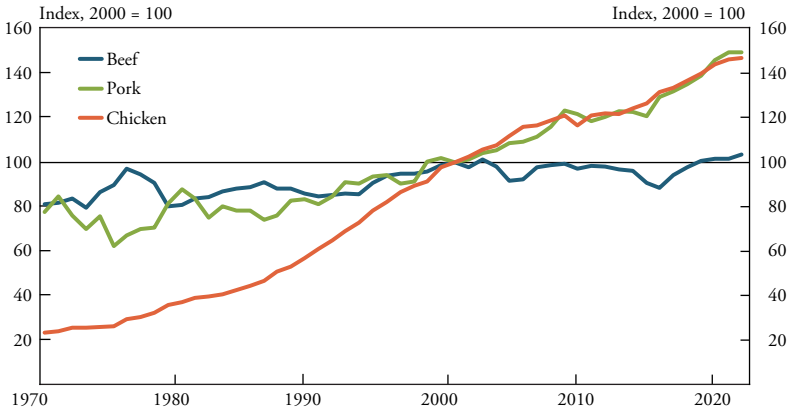
In recent decades, production and consumption of beef have not kept pace with other animal proteins. Chart 6 shows that throughout the 1970s and 1980s, beef was “what’s for dinner”—to quote an early 1990s ad campaign—and in the United States, more beef was produced than pork or chicken. However, by 2000, production and consumption of pork and chicken caught up to beef and have since been on steeper increasing trajectories, while U.S. beef production and consumption have been relatively flat.

Public perceptions of climate change and its relationship with meat production, alongside consumer preferences for other protein products and beliefs about animal welfare and nutrition, could also pose some downside risks to domestic demand for beef and cattle producer profitability. For example, in 2019, the United Nation’s Intergovernmental Panel on Climate Change urged people to eat less meat and more plant-based foods to improve health and reduce carbon dioxide emissions by up to 15 percent (IPCC 2019). More recently, a popular cooking website banned new beef recipes over concerns about climate change (Taylor and Morales 2021). In 2021, a popular New York City restaurant announced that it would no longer serve meat or seafood, becoming one of the most high-profile restaurants to switch to a plant-based menu out of environmental concerns (Anderson and Gross 2021).

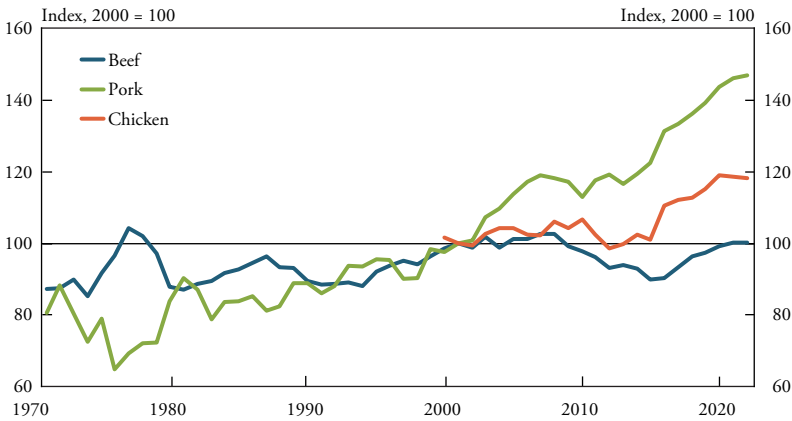
Amid concerns about health, animal welfare, and the environmental effects of meat production, the popularity of plant-based meat products has risen, though these products still account for a very small share of the protein market. Consumers purchase traditional beef in the marketplace about three times more often than plant-based protein alternatives (Tonsor, Lusk, and Schroeder 2021). Although the market share for alternative protein sources is currently small, higher demand for plant-based meat could contribute to lower aggregate demand for

Chart 6
U.S. Meat Consumption and Production

Panel A: U.S. Meat Production



Panel B: U.S. Meat Consumption



Note: Data for chicken consumption are unavailable prior to 1999.
Source: USDA.

beef and thereby reduce demand for cattle upstream. If demand for cattle declines, the only way to increase profits for cattle operations would be to reduce the cattle supply. According to a recent working paper by Lusk and others (2021), a 10 percent increase in demand for plant-based meat would reduce U.S. cattle production by approximately 0.15 percent, resulting in a \$300 million decline in economic welfare for U.S. cattle producers.

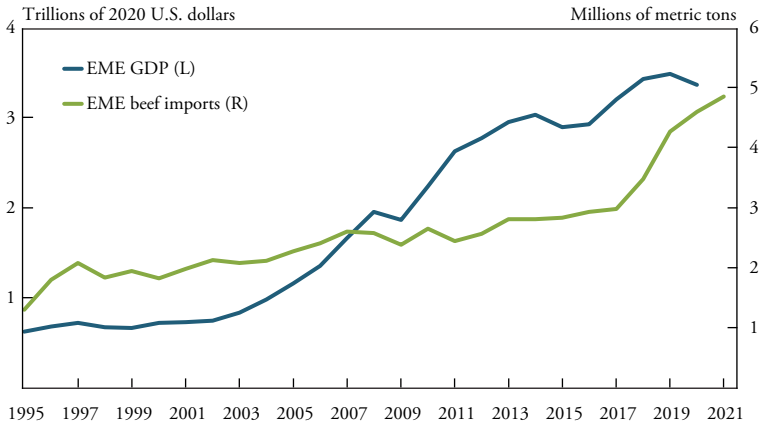
Despite longer-term pressures on domestic demand for beef, prospects for international demand are bright, particularly as economies become more prosperous. The United States went from exporting about 16,000 metric tons of beef per year in the 1960s to exporting almost 1.34 million metric tons of beef in 2020. The U.S. beef industry is on pace to export more in 2021, as March and May set new monthly records for beef exports. The recent surge in beef exports is broad based (USMEF 2021). Although China has contributed substantially to growing U.S. beef exports, several other countries have as well, especially those considered emerging market economies (EMEs).⁴

The outlook for EMEs' demand for beef has improved in recent years and could continue to grow in the decades following the pandemic. Chart 7 shows that from 1995 to 2017, beef imports to EMEs grew at a steady pace of about 4 percent per year. Starting in 2018, however, beef imports to EMEs grew 15 percent per year on average alongside strong GDP growth. Moreover, despite EMEs accounting for only 36 percent of the world's nominal GDP in 2021, EMEs' share of total world imports of beef has grown from 28 percent in 1995 to 51 percent in 2021.

Higher international demand for beef could offset any potential declines in U.S. demand related to shifting consumer preferences. After the industry works through backlogs created by short-term supply shocks, stronger demand will also help support prices for cattle. In the longer term, growing global demand for beef could encourage some expansion of slaughter capacity in the United States. Under current conditions of tight labor markets and more efficient supply chains, the United States might not be able to produce enough beef to meet a dramatic increase in international demand. But if global demand for beef continues to grow at a strong, steady pace, U.S. ranchers and

Chart 7

GDP and Beef Imports in EMEs



Note: EMEs include the following countries, in alphabetical order: Argentina, Brazil, Chile, China, Colombia, Egypt, Hungary, India, Indonesia, Iran, Malaysia, Mexico, the Philippines, Poland, Russia, Saudi Arabia, South Africa, Thailand, Turkey, and the United Arab Emirates.

Sources: USDA and International Monetary Fund (accessed through Haver Analytics).

meatpackers may invest further in expanding slaughter capacity and beef production.

Conclusion

Recent shocks related to the pandemic, weather, and a cyberattack led to a decline in demand for cattle at processing plants and a weak price environment for cattle producers, who were not able to adjust herd sizes quickly enough to increase profitability. Without adjusting the supply of cattle, short-term disruptions could result in a longer period of low profitability for cattle producers. Farm financial conditions in the cattle industry could continue to be challenging if government support is withdrawn or if slaughter capacity remains limited.

In years ahead, the cattle industry faces several pressures that could threaten profitability, but there are opportunities for growth as well. The pandemic and other disruptions revealed vulnerabilities in the cattle and beef supply chain that, if not addressed, could continue to result in larger and longer-lasting downside risks for cattle producers when shocks occur. But these disruptions have also increased consumer interest in locally sourced beef and may have spurred new ways to improve resilience, information transmission, and automation in the in-

dustry, which could benefit producers in coming decades. More variable weather conditions and intense drought also present downside risks for cattle prices and producer profits, with some areas of the country facing more strain than others. However, farmers and cattle producers have long adopted new technologies and sustainable practices on their operations, which could offset some of the effects of more variable weather moving forward. And even if plant-based and lab-raised proteins and traditional meats besides beef gain market share in the United States, international markets for beef could replace any displaced domestic demand. In 2021, U.S. beef exports have set new records in almost every month. As countries recover from the pandemic and incomes increase around the world, global demand for traditional meat will likely increase, supporting U.S. cattle producers.

Endnotes

¹Steers and heifers make up almost 80 percent of total annual cattle slaughter in the United States, with cows, bulls, and calves comprising the remaining 20 percent.

²The U.S. Drought Monitor classifies drought conditions into five categories: abnormally dry, moderate drought, severe drought, extreme drought, and exceptional drought. When an area is in severe-to-exceptional drought, it may experience widespread crop losses, water shortages and restrictions, and decreased reservoir levels. In addition, areas in severe drought for eight consecutive weeks, or in extreme or exceptional drought for any period, may be considered experiencing a natural disaster and thus eligible for federal disaster assistance.

³Tenth District states include Colorado, Kansas, Nebraska, Oklahoma, Wyoming, northern New Mexico, and western Missouri.

⁴According to the International Monetary Fund, EMEs have lower incomes than “advanced” economies but have “sustained strong growth and stability that can produce higher-value-added goods and are more like advanced economies not only when it comes to income, but also in participation in global trade and financial market integration” (Dutttagupta and Pazarbasioglu 2021, p. 7).

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