

The Russia/Ukraine War and Evolving Commodity Market and Supply Chain Issues

OSU Rural Economic Outlook Conference

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The views expressed here are those of the speaker and do not necessarily reflect the opinions of the Federal Reserve Bank of Kansas City or the Federal Reserve System.

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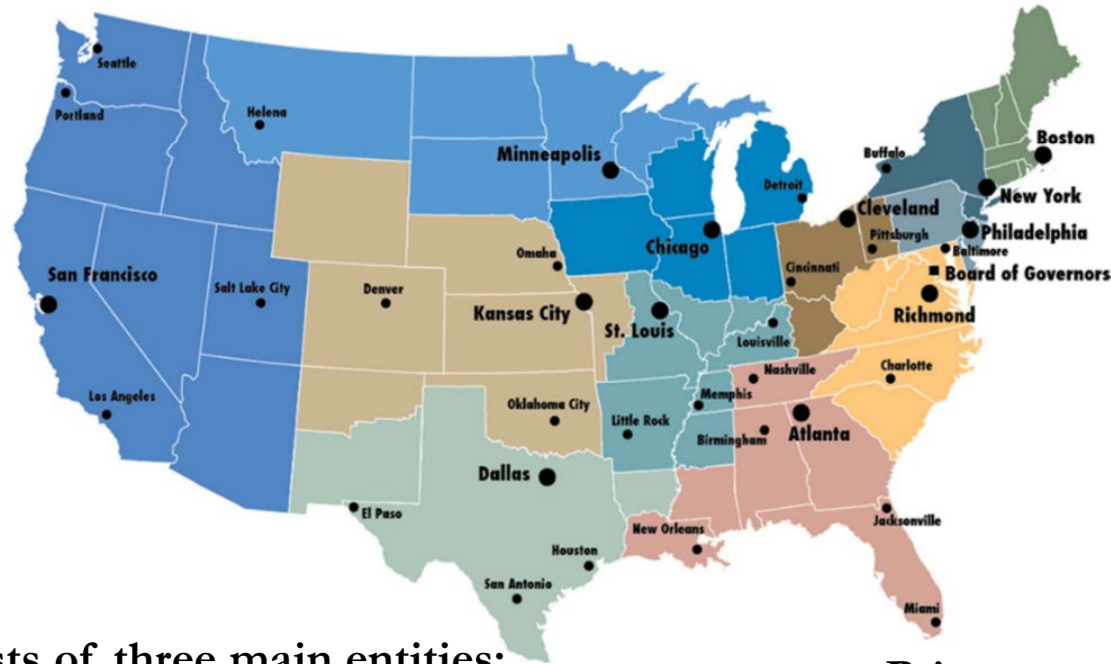


Summary

- The agricultural economy in the United States remains strong, supported by high prices and robust demand for U.S. farm products.
- However, concerns about supply chains have intensified following the pandemic, the war in Ukraine, and other supply chain disruptions.
- One primary result of these disruptions has been higher prices (and costs) for producers and consumers.



Structure and Function of the Federal Reserve



The “Fed” consists of three main entities:

- Board of Governors: 7 members appointed by U.S. President
- Federal Reserve Banks: 12 total; semi-independent by design
- Federal Open Market Committee: 19 members; 12 voting

Primary responsibility areas:

- Monetary policy
- Bank regulation
- Financial services



Oklahoma City Branch of the Federal Reserve Bank of Kansas City

Functions and purposes ~ 50 staff

- Research on U.S. and Oklahoma economies; energy sector and business survey focus
- Examinations of Oklahoma financial institutions (~45 banks, ~175 holding cos.) Risk analysis and IT development for bank exams; exam assistance for other Fed offices
- Community development programming for low/moderate income groups, workforce focus
- Economic education and public outreach programming

2022 OKC Branch Board of Directors

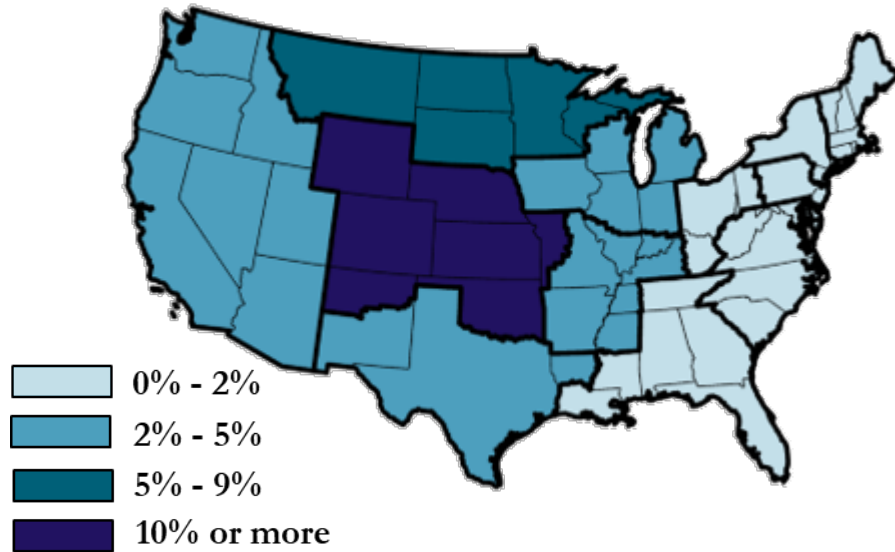
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The Kansas City Fed has a high concentration in agriculture and monitors conditions closely.

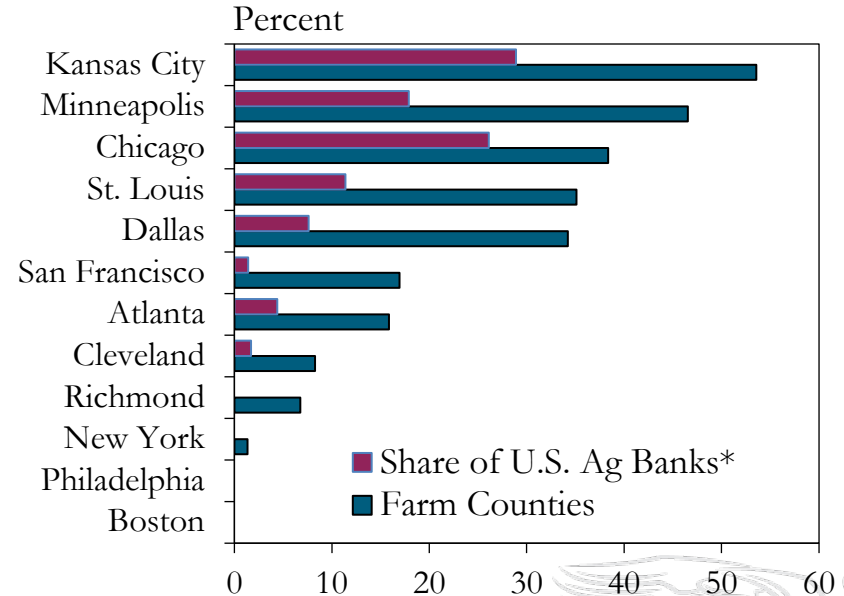
Farm Income as a Share of Total Personal Income

Average Across Counties by Fed District, 2010-2020



Source: BEA and staff.

Proportion of “Farm Dependent” Counties and Agricultural Banks

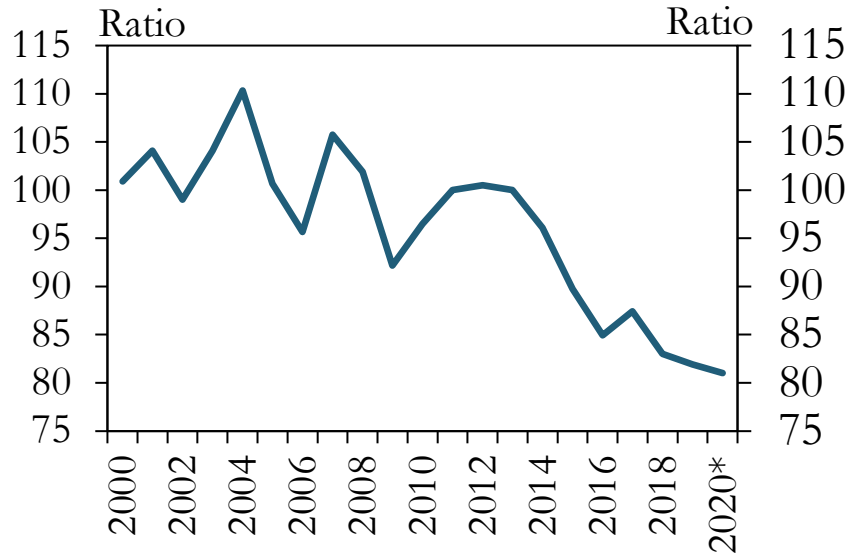


Source: BEA, USDA, Ag Finance Databook and staff

*Agricultural banks are defined as banks with farm production and farm real estate loans equaling approximately 18 percent or more of total loans.

At the end of 2019, the ag economy appeared to be entering another year of decline in 2020.

Ag Prices Received-to-Prices Paid

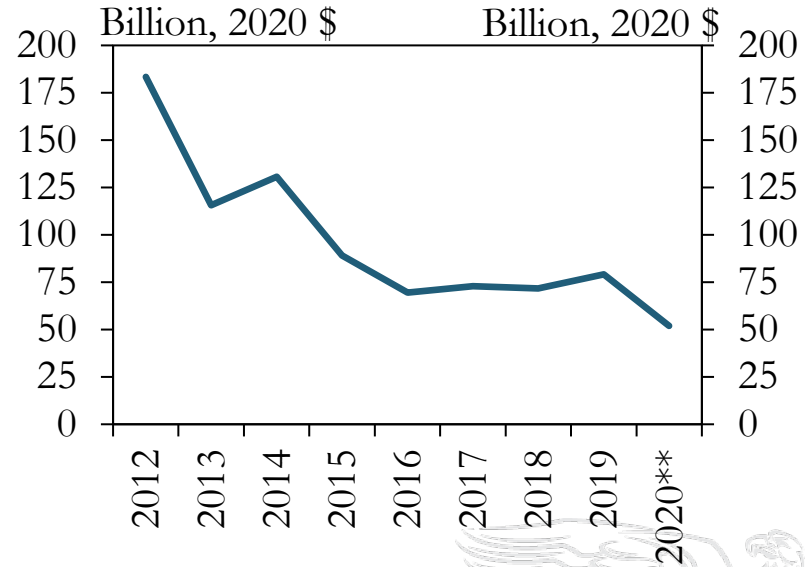


*Q1 2020.

**As of February 5, 2020

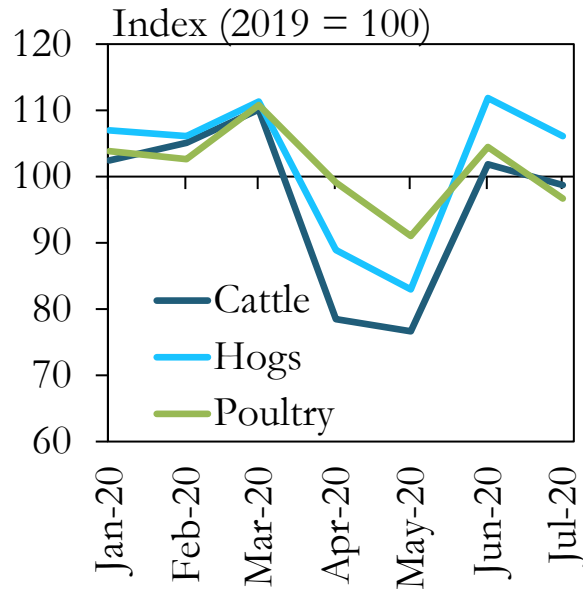
Sources: USDA and Haver Analytics.

U.S. Farm Sector Working Capital

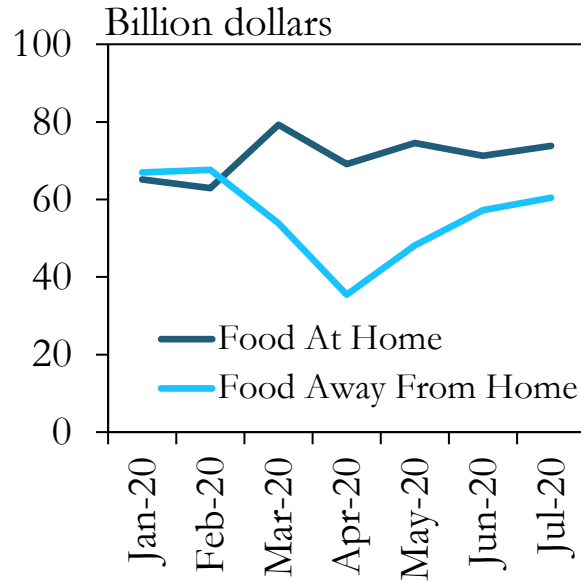


And then the pandemic disrupted nearly all segments of the food and ag sector in 2020.

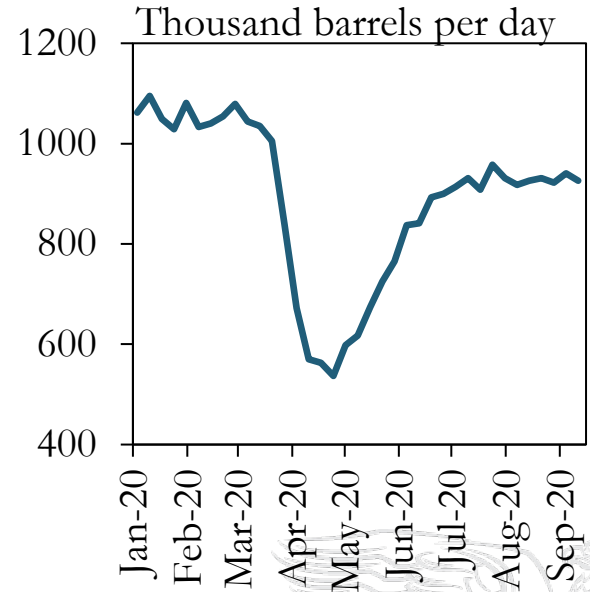
U.S. Meat Production



U.S. Food Expenditures



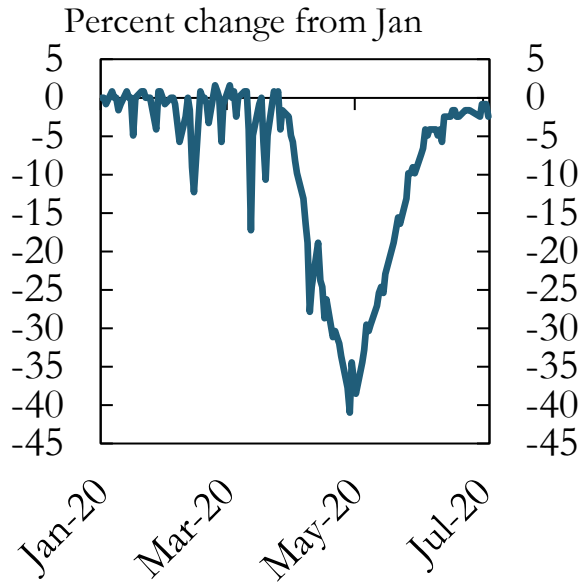
U.S. Ethanol Production



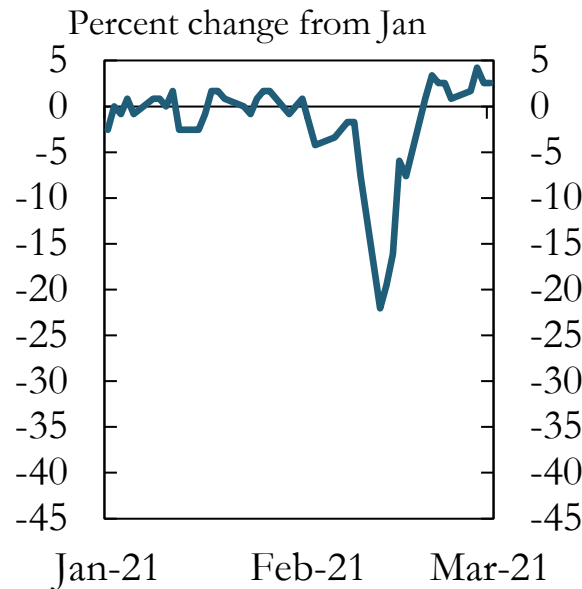
Sources: USDA, EIA and staff calculations.

But especially the beef supply chain, which then was impacted by additional disruptions in 2021.

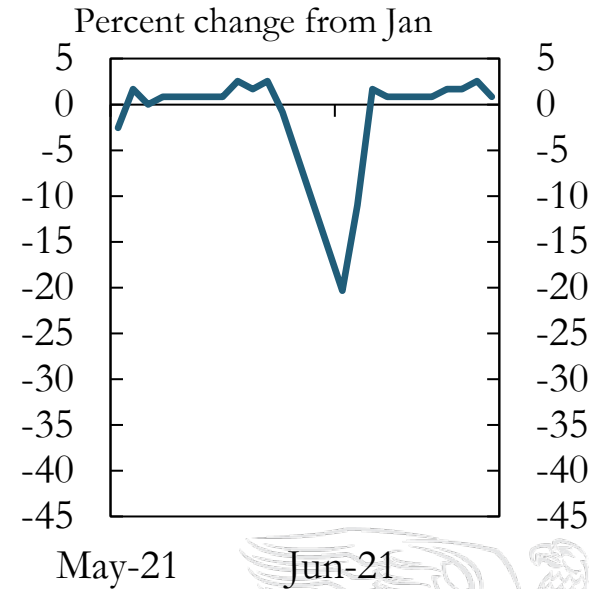
COVID-19



2021 Winter Storm



Cyberattack at JBS

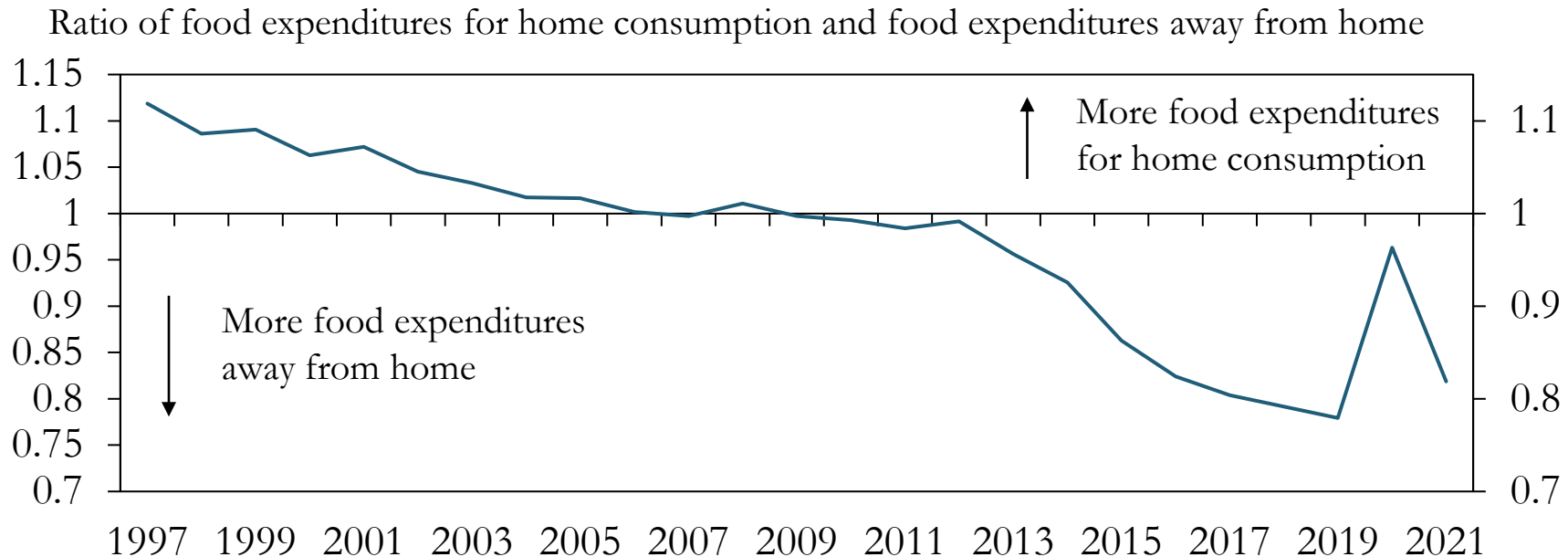


Sources: USDA and author's calculations.



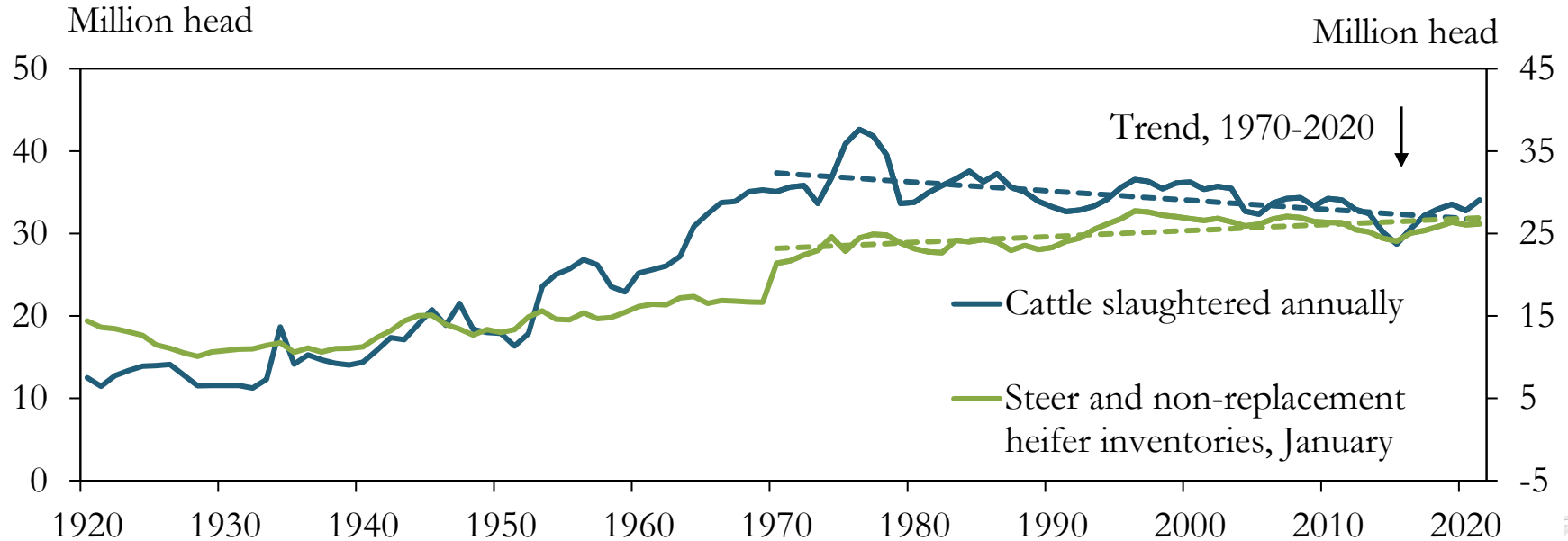
Dramatic changes in consumer food purchases also disrupted food and commodity markets.

Household Expenditures on Food



A more efficient supply chain may have made both producers and consumers more vulnerable to shocks.

Transitioning to a More Efficient Supply Chain



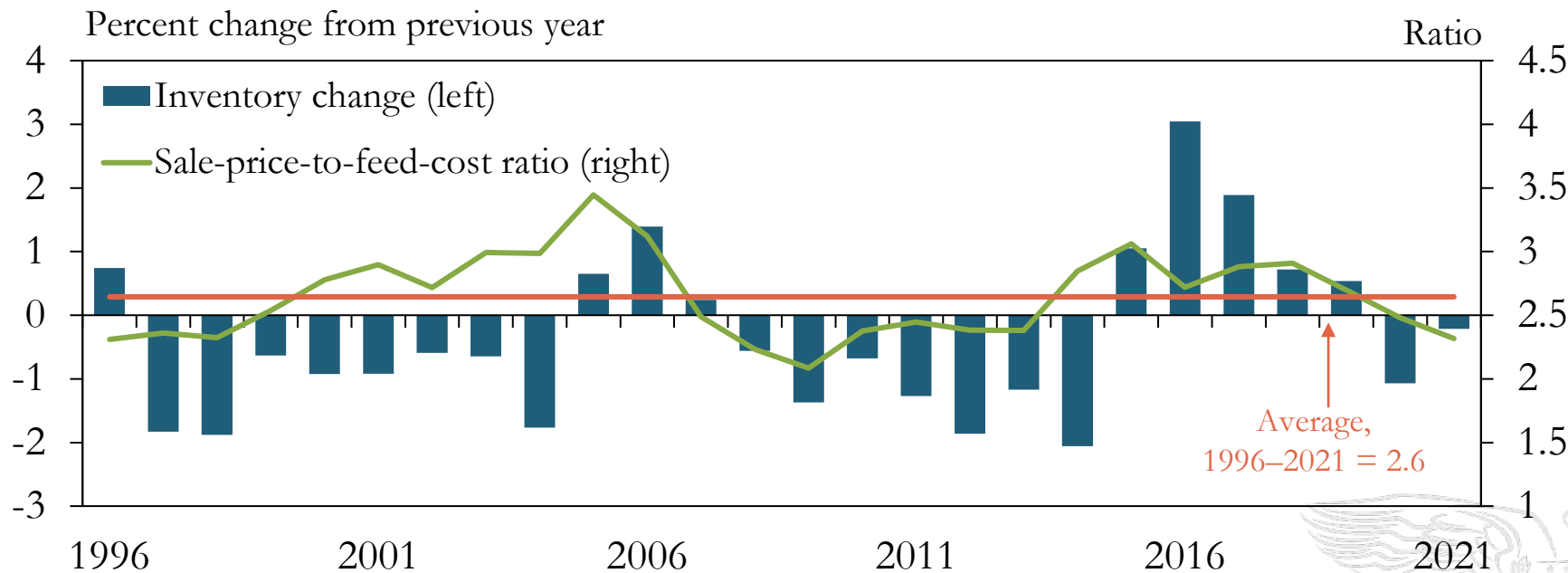
Note: Cattle slaughter for 2021 projected based on number of animals slaughtered year-to-date in September 2021.

Sources: U.S. Department of Agriculture (USDA) and Iowa State University.

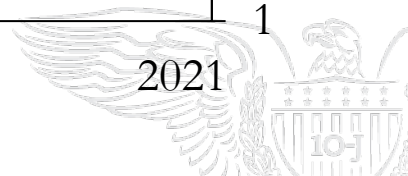


Also, cattle inventories may have declined by less than expected in 2021.

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

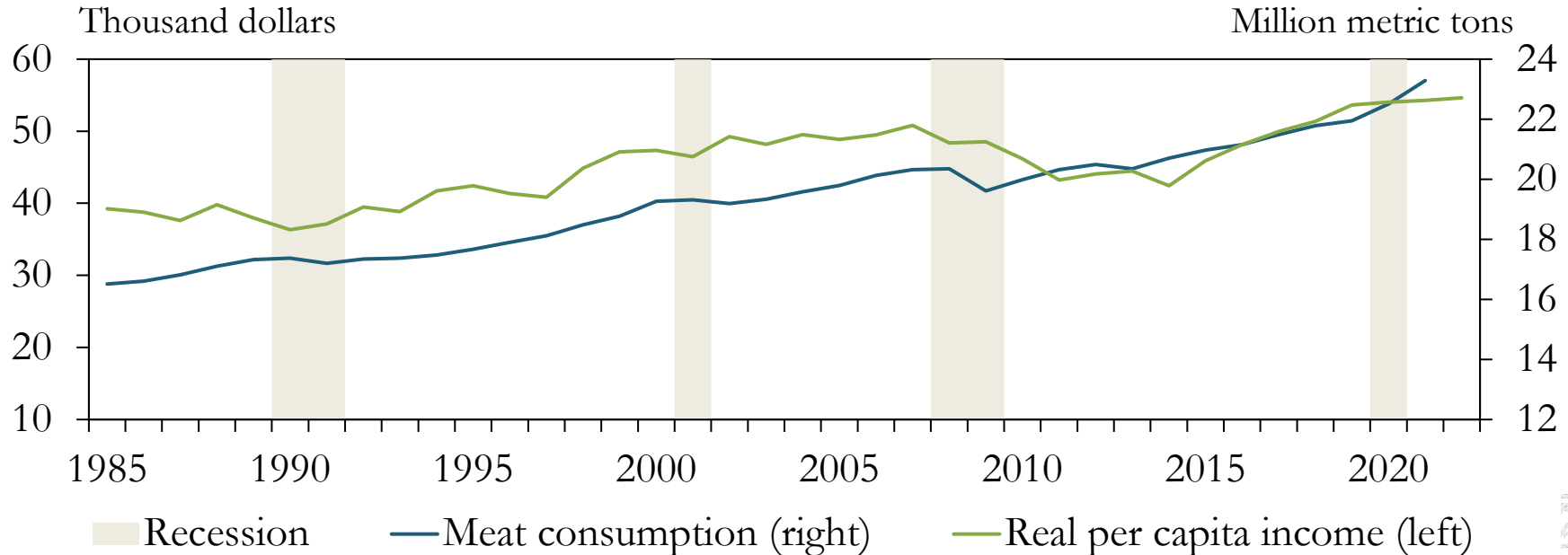


Sources: USDA and author's calculations.



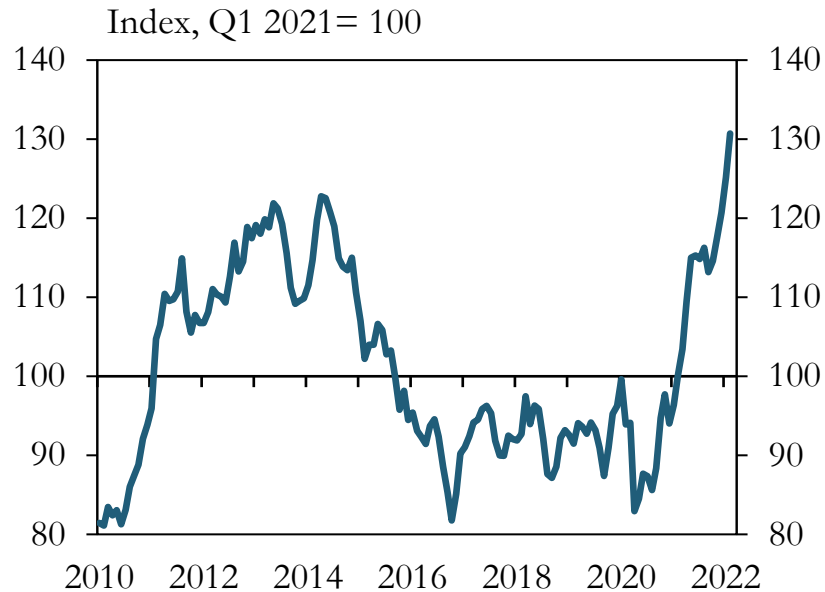
Unlike in the past, household income rose during the pandemic-induced recession, supporting demand.

U.S. Household Income and Meat Consumption

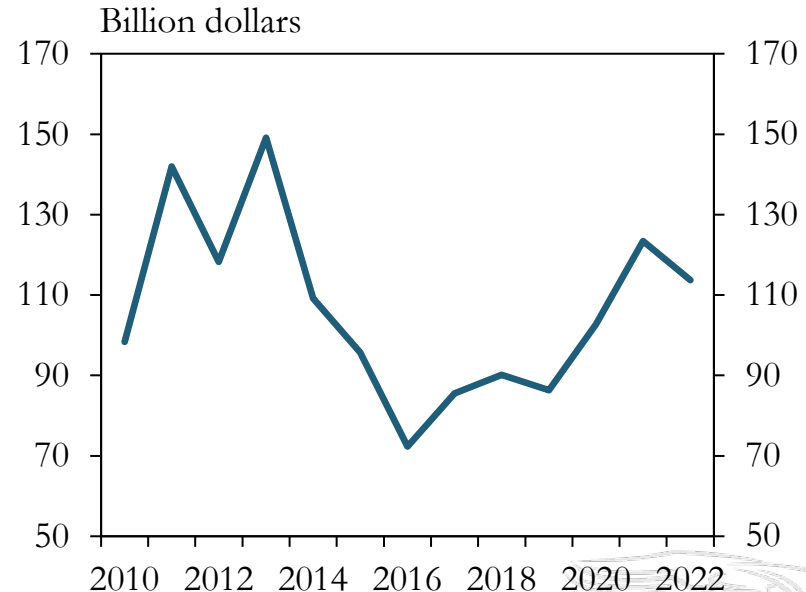


Following the global pandemic, prices of farm commodities rebounded strongly and have supported farm income.

U.S. Agricultural Price Index*

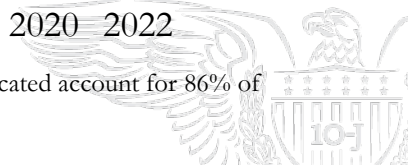


U.S. Farm Income



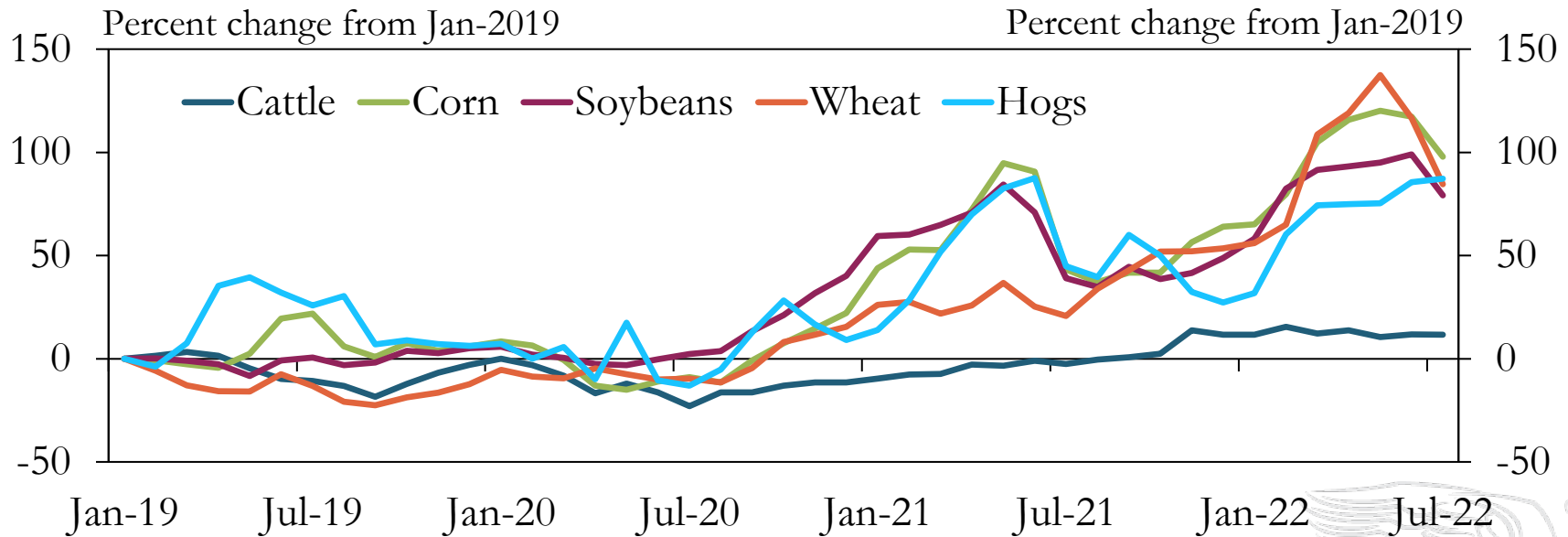
* Weighted based on share of total 2020 agricultural cash receipts attributed to each individual commodity. Individual commodities allocated account for 86% of total 2020 cash receipts.

Sources: USDA and staff calculations



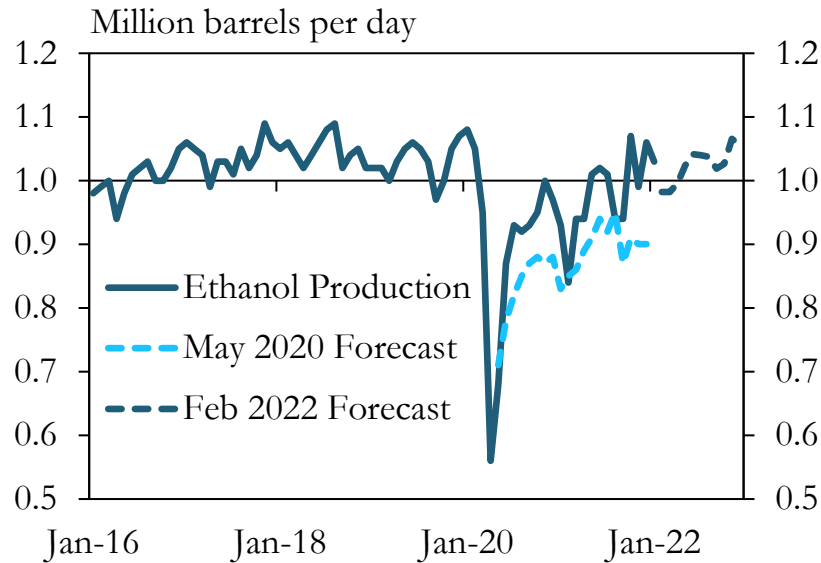
Cattle markets have struggled to recover, and despite a recent pullback in other commodities, prices remain above previous levels.

Agricultural Commodity Prices

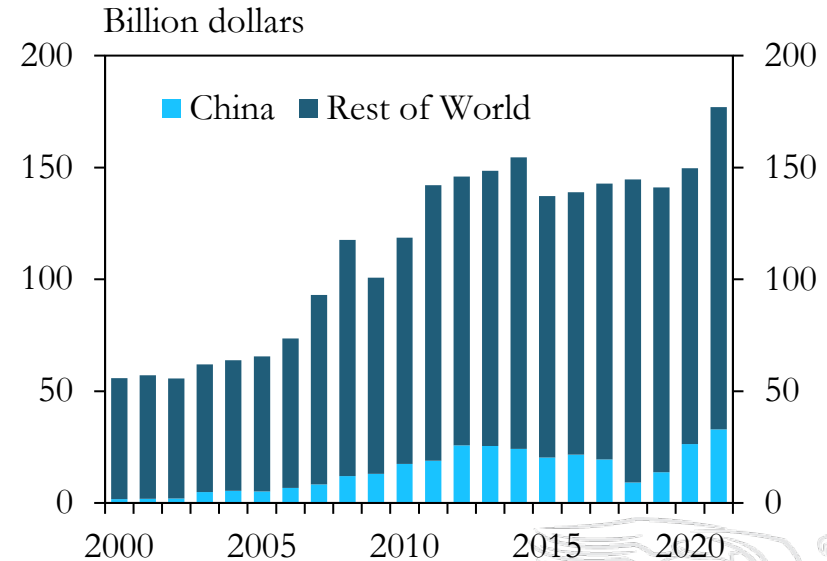


Farm prices continue to be supported by strong demand, both in the U.S. and internationally.

Ethanol Production

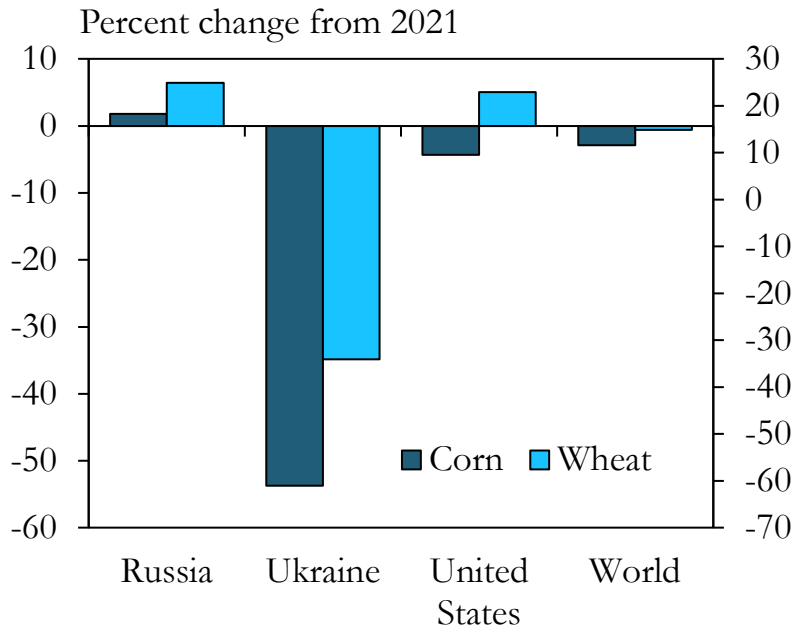


U.S. Exports of Bulk Ag Commodities



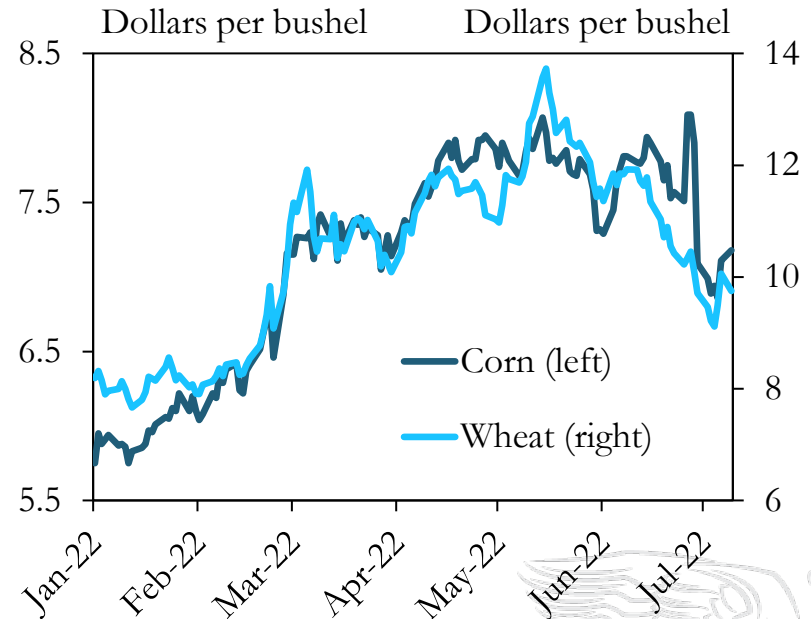
However, Russia's invasion of Ukraine caused broad disruptions in global commodity markets.

2022 Production Forecasts



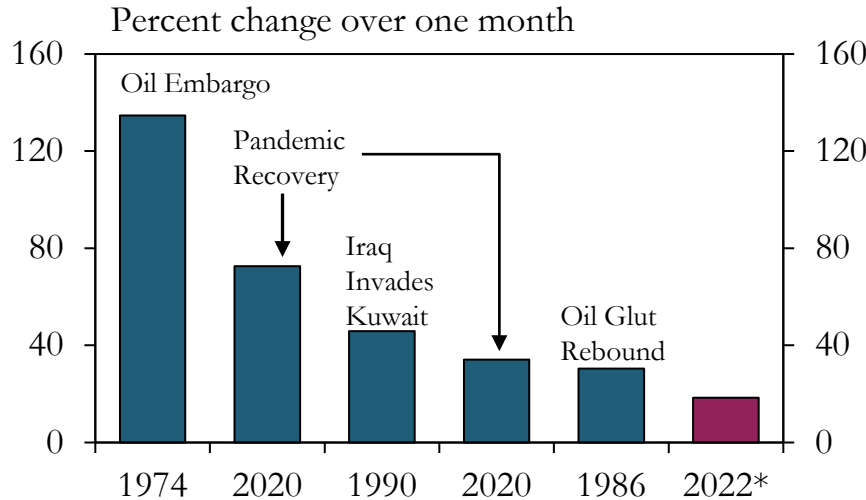
Source: USDA

Grain Prices

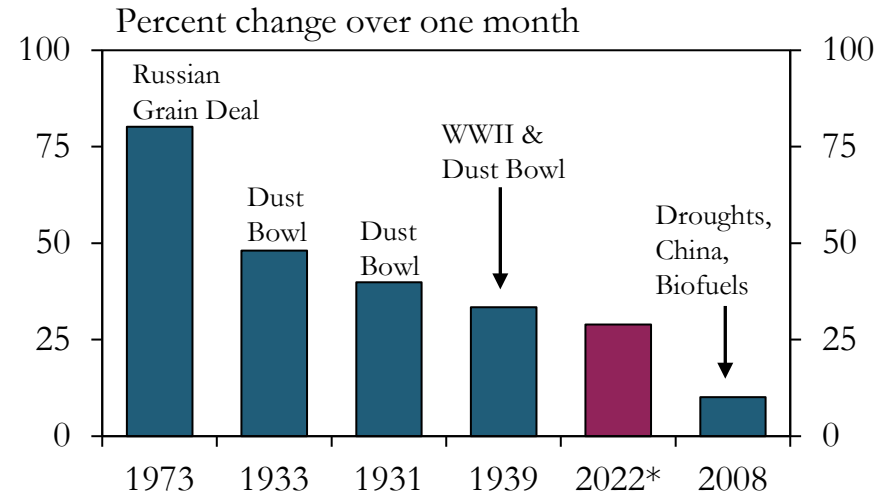


Price movements for oil and wheat following the Ukraine conflict were historical in nature.

Largest Increases in Crude Oil Prices since 1946



Largest Increases in Wheat Prices since 1908

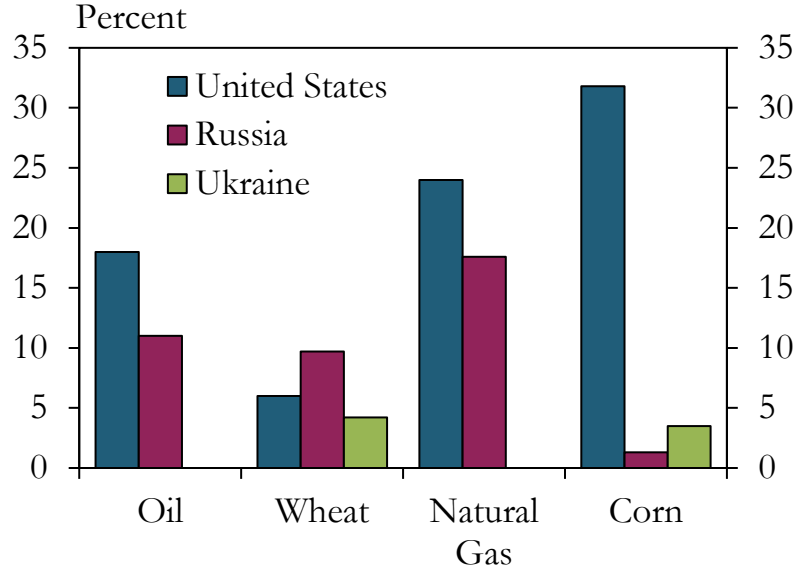


* The change in oil prices from February 2022 to March 2022 was the 16th largest on record, and the change in wheat prices in March 2022 was the seventh largest on record, after the Russian Grain Deal and Dust Bowl/WWII period (three months in 1933 were in the top six, and two of those months are excluded for brevity).
Note: Historical crude oil prices are available back to 1946 via the Federal Reserve Bank of St. Louis, and the U.S. Department of Agriculture provides data on wheat prices back to 1908.

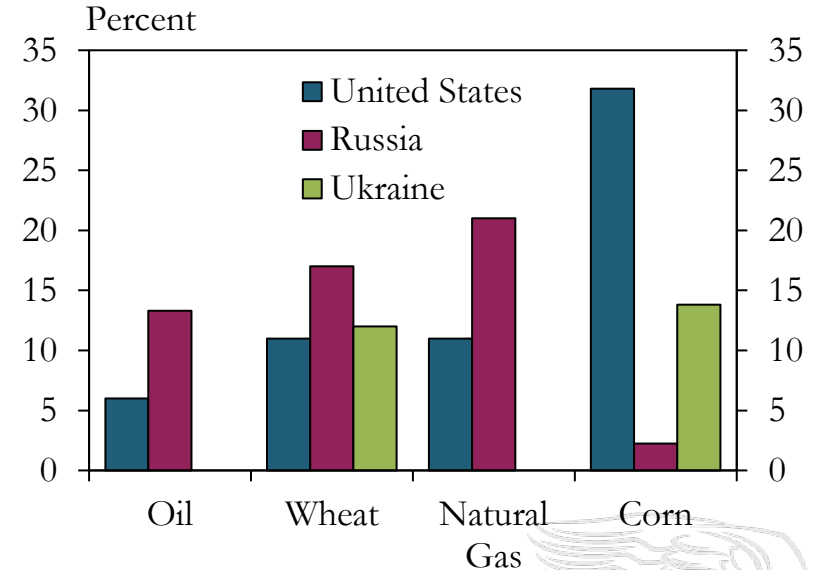
Sources: The Federal Reserve Bank of St. Louis and U.S. Department of Agriculture.

Russia and Ukraine account for a large share of global production and exports of several major commodities.

Share of World Production



Share of World Exports

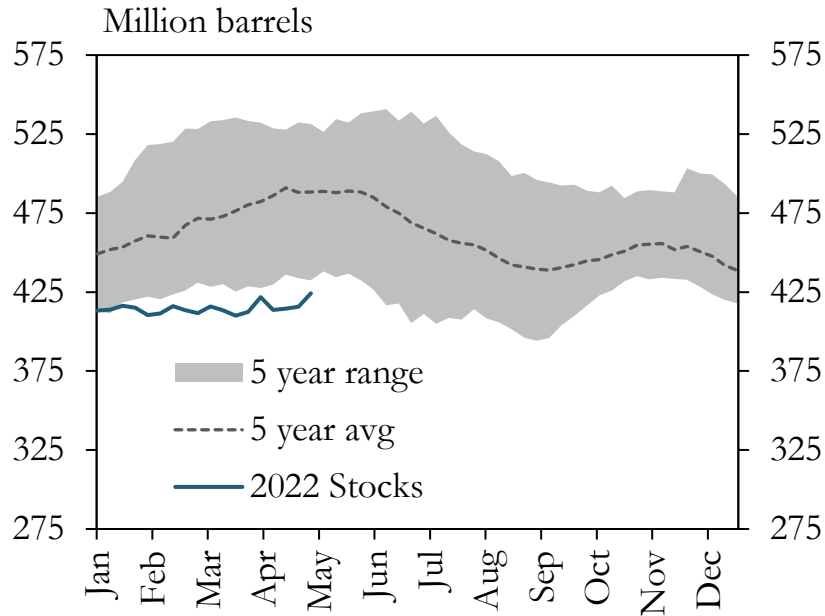


Sources: U.S. Departments of Energy and Agriculture.

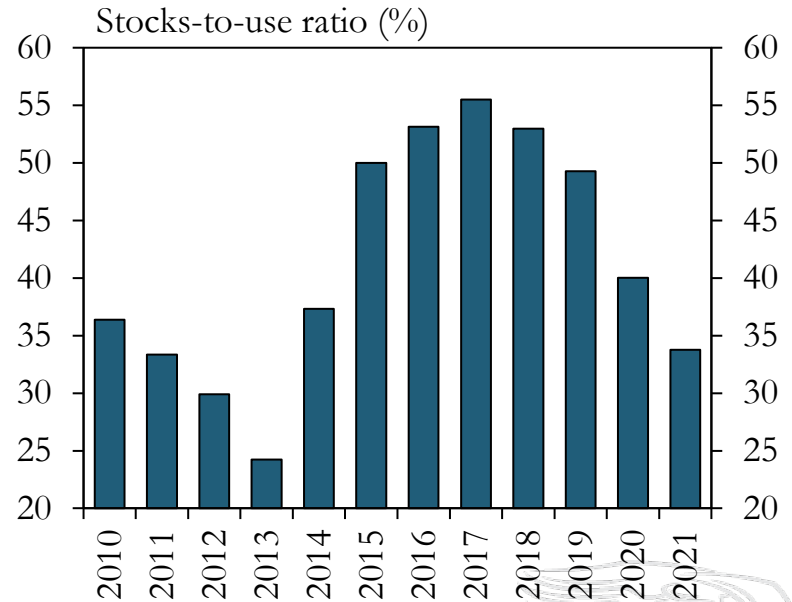


Price increases were exacerbated by low and declining inventories.

U.S. Oil Inventories

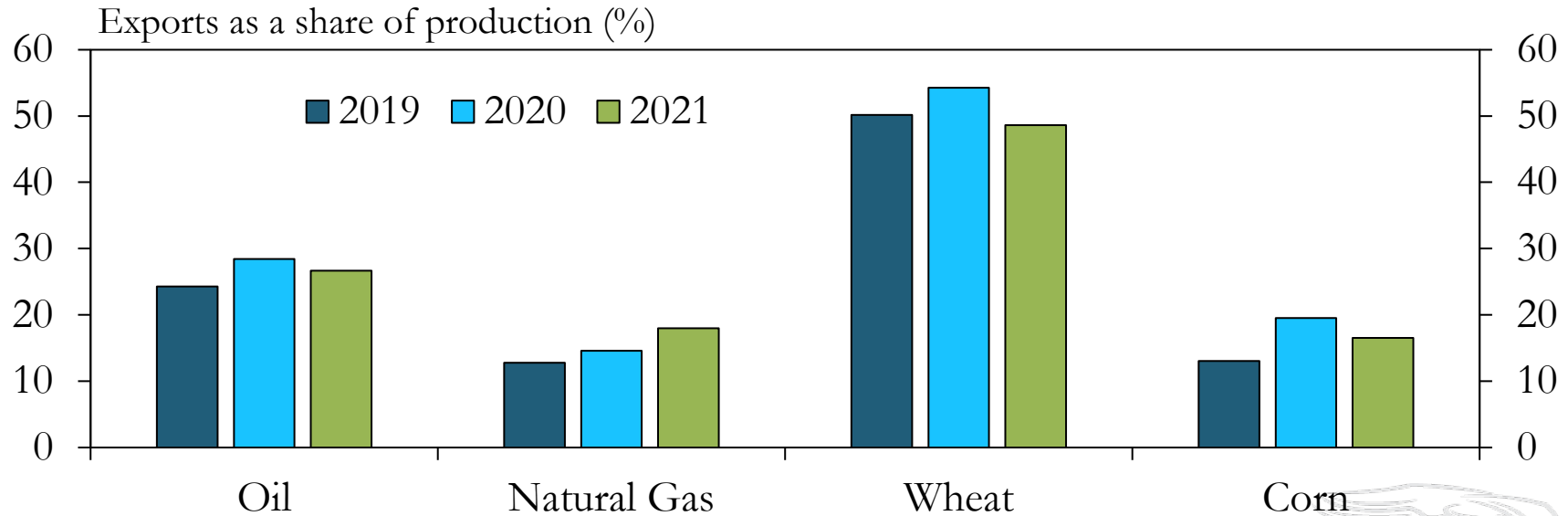


U.S. Wheat Inventories



As an exporter, the U.S. has been somewhat insulated from concerns about shortages and food security.

U.S. Net Exports

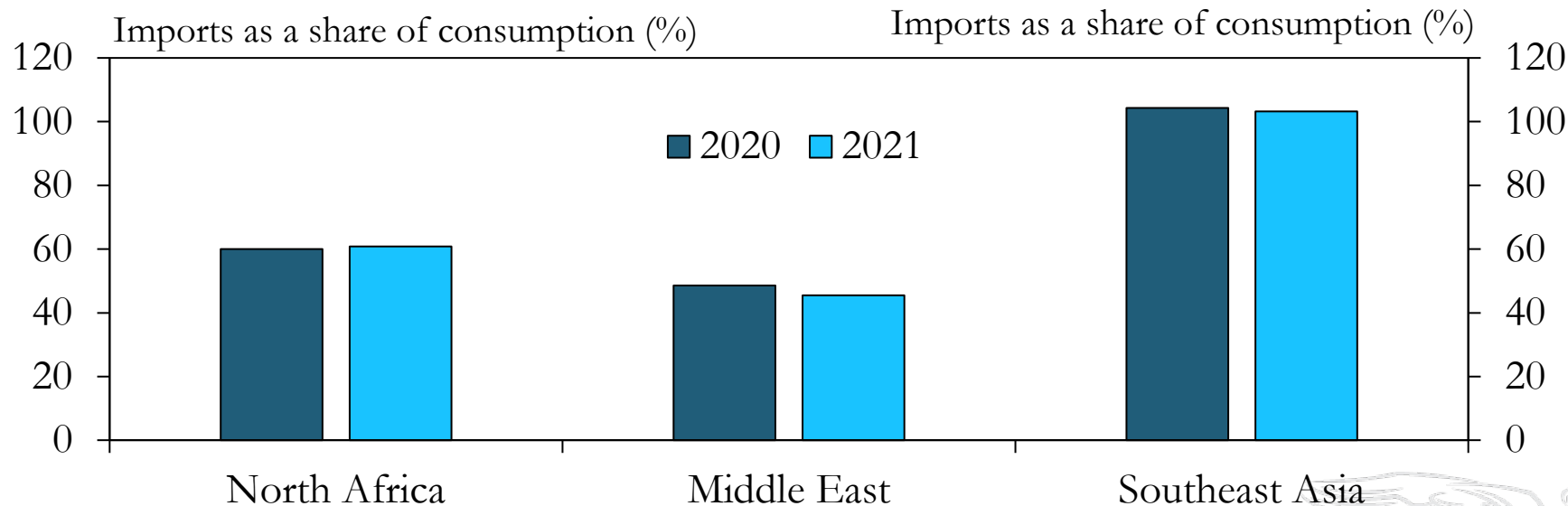


Source: U.S. Departments of Energy and Agriculture.



But the potential for food shortages is a growing concern in several key regions.

Net Imports of Wheat



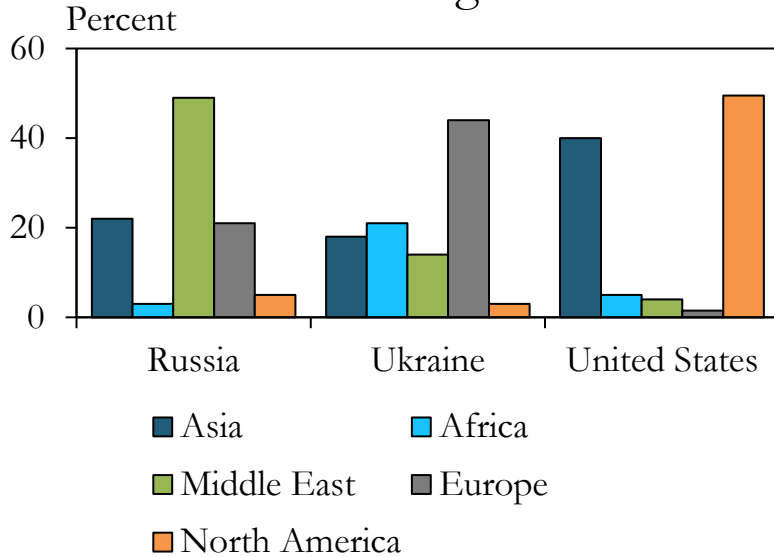
Note: 71% of wheat exports from Russia were destined for the Middle East and Africa in 2021, while 77% of wheat exports from Ukraine went to partner countries in Africa and Asia.

Source: USDA

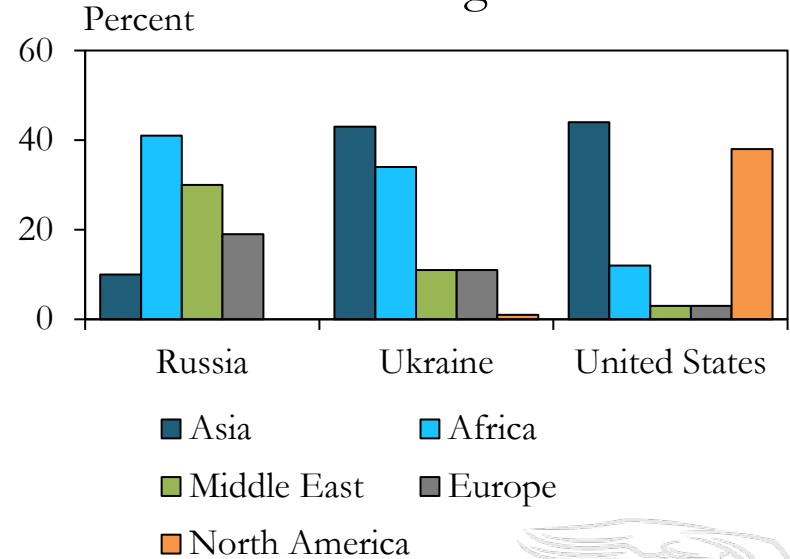


Particularly those regions reliant on agricultural exports from Russia and Ukraine.

Share of Corn Exports to Partner Regions

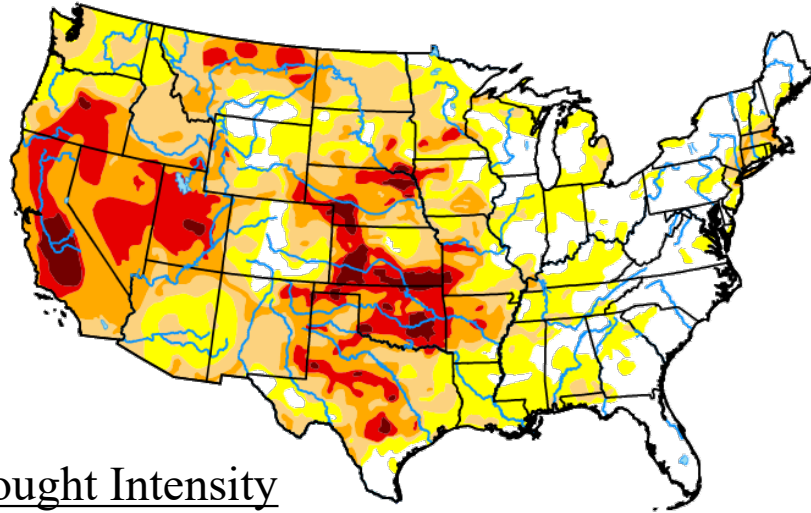


Share of Wheat Exports to Partner Regions

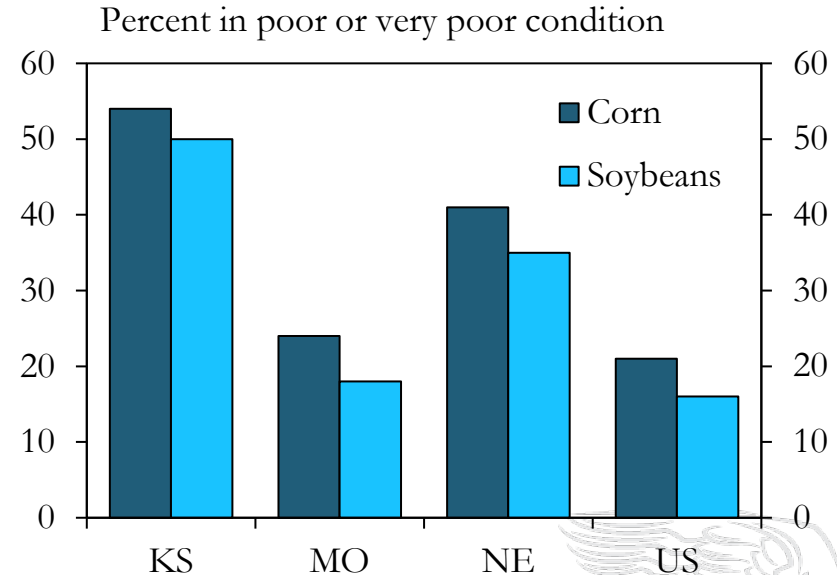


Another disruption: severe drought has had a notable impact on crop conditions and expected production.

U.S. Drought Conditions

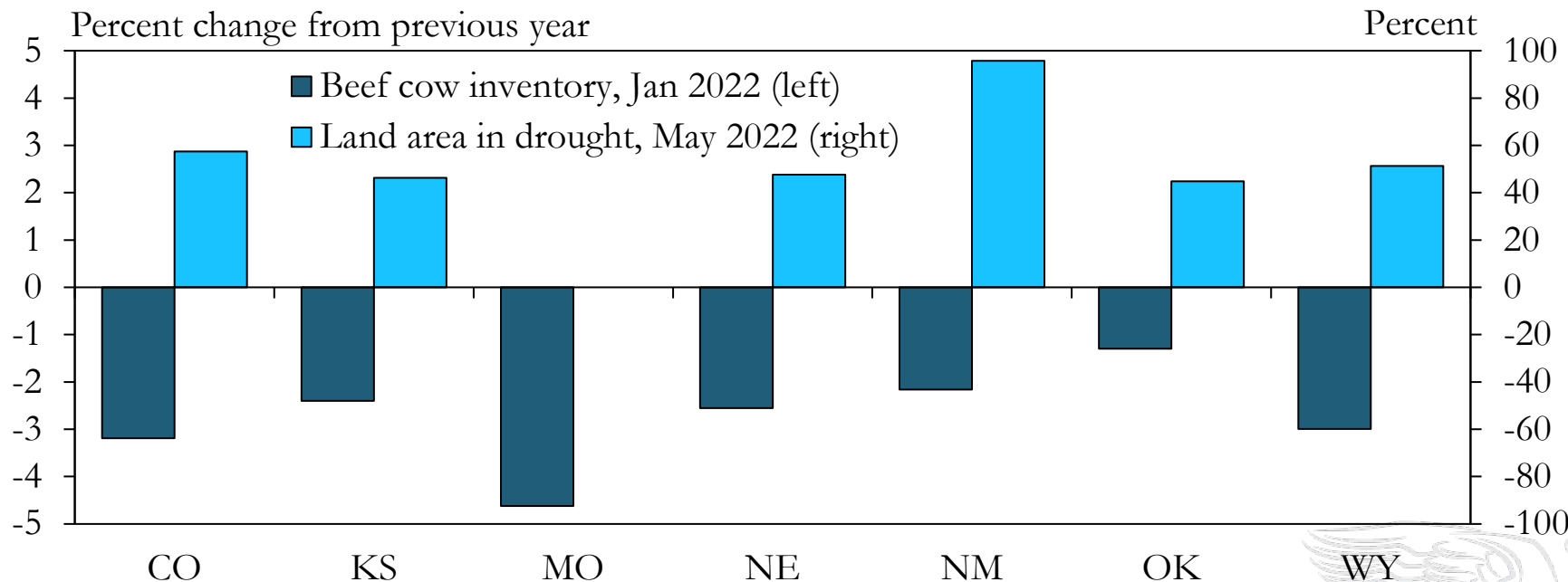


Corn and Soybean Crop Condition, October 3rd



Drought and higher feed costs have prompted some herd liquidation in cattle-producing states.

Drought and Beef Cow Inventories



Drought has also disrupted barge traffic on the Mississippi River.

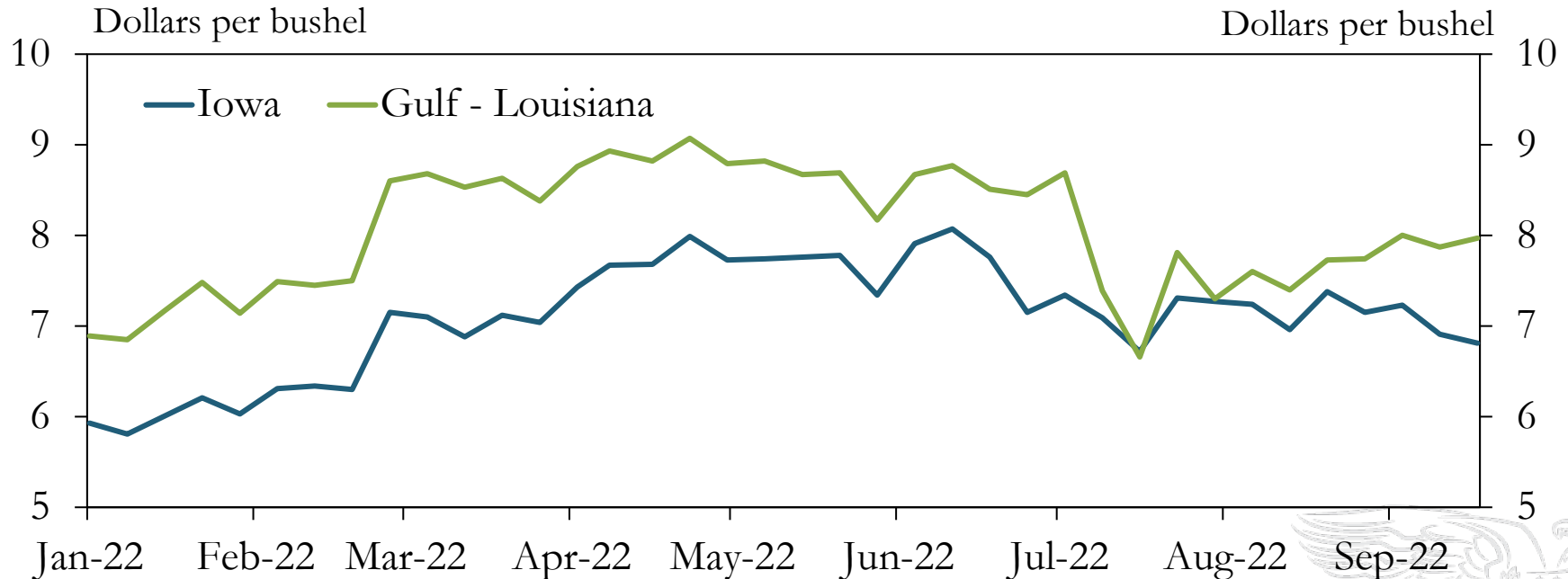
US farmers face another headache as a drought in the Midwest forces restrictions on Mississippi River barge traffic. Falling river levels have come at a time of year when crop harvests require increases in river shipping capacity. “The U.S. Department of Agriculture’s Grain Transportation Report released Thursday said that 1,890 grain barges have unloaded in New Orleans since Sept. 1, about 39% fewer than the five-year average.” (Baton Rouge Business Report)

No sign of near-term relief -- “Some Mississippi River communities between St. Louis and New Orleans may see record low water levels in the coming days, including Caruthersville, Missouri, and Osceola, Arkansas. The National Weather Service predicts the reading at Memphis, Tennessee, will reach its second-lowest level ever by Oct. 13.” (Baton Rouge Business Report)



We are starting to see some divergence between the Iowa and Gulf prices for corn, though it seems a gap is normal.

Corn Prices by Location



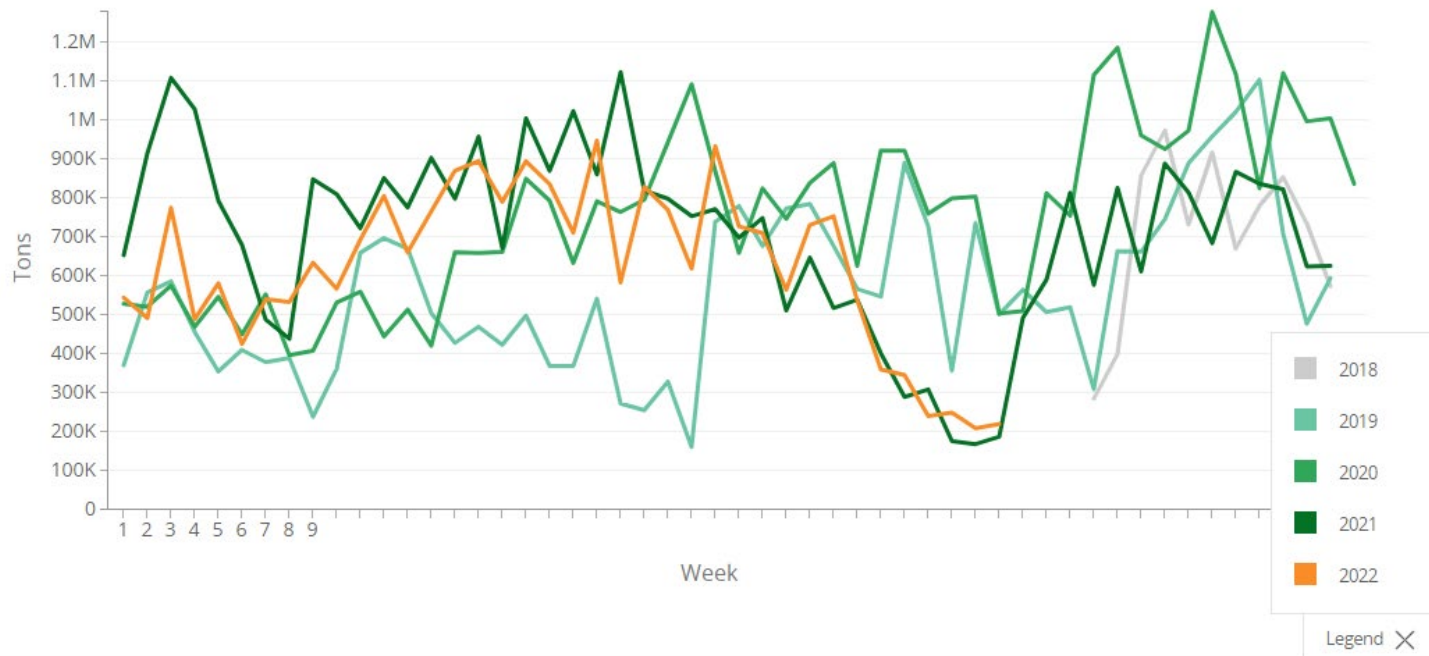
Source: [USDA](#)



Total tonnage of grain shipments is down, but similar to levels from a year ago.

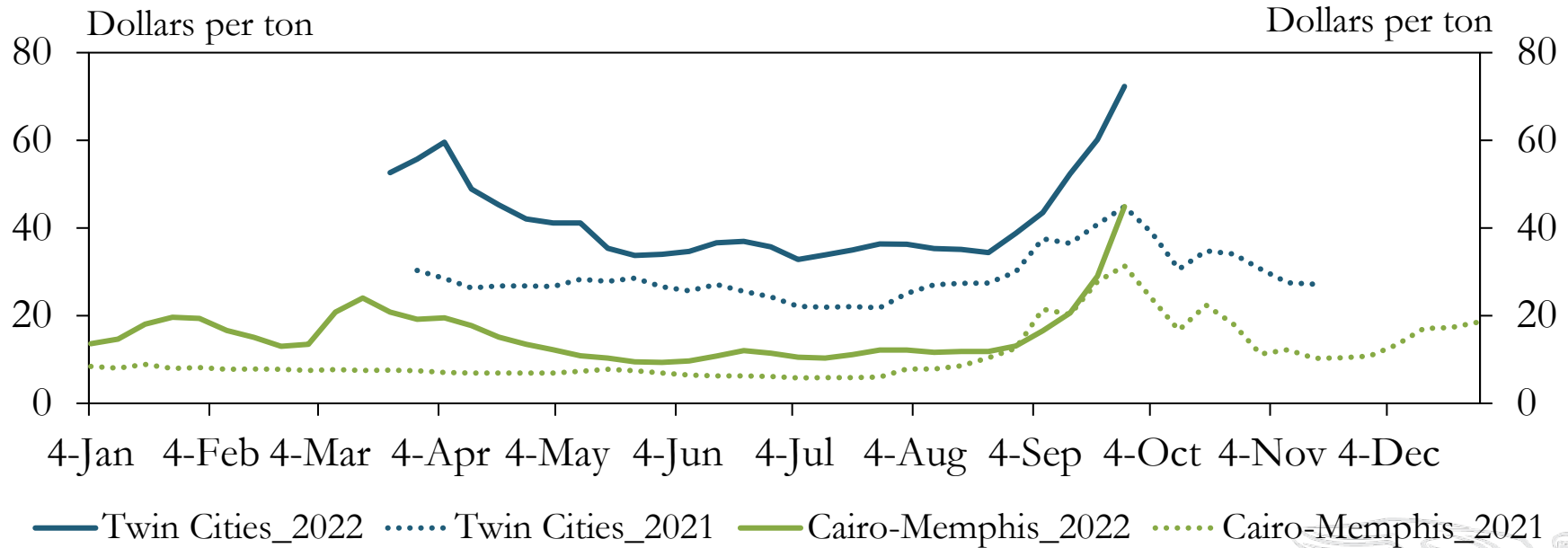
Weekly Grain Barge Tonnages, Seasonal Comparison

This chart shows weekly tonnages of grain barge movements transited through Mississippi River Lock 27, Ohio River Lock 52, and Arkansas River Lock 1. Each line represents a year's data.



However, although barge rates typically increase in September, they have increased more rapidly this year.

Downbound Grain Barge Rates by Location

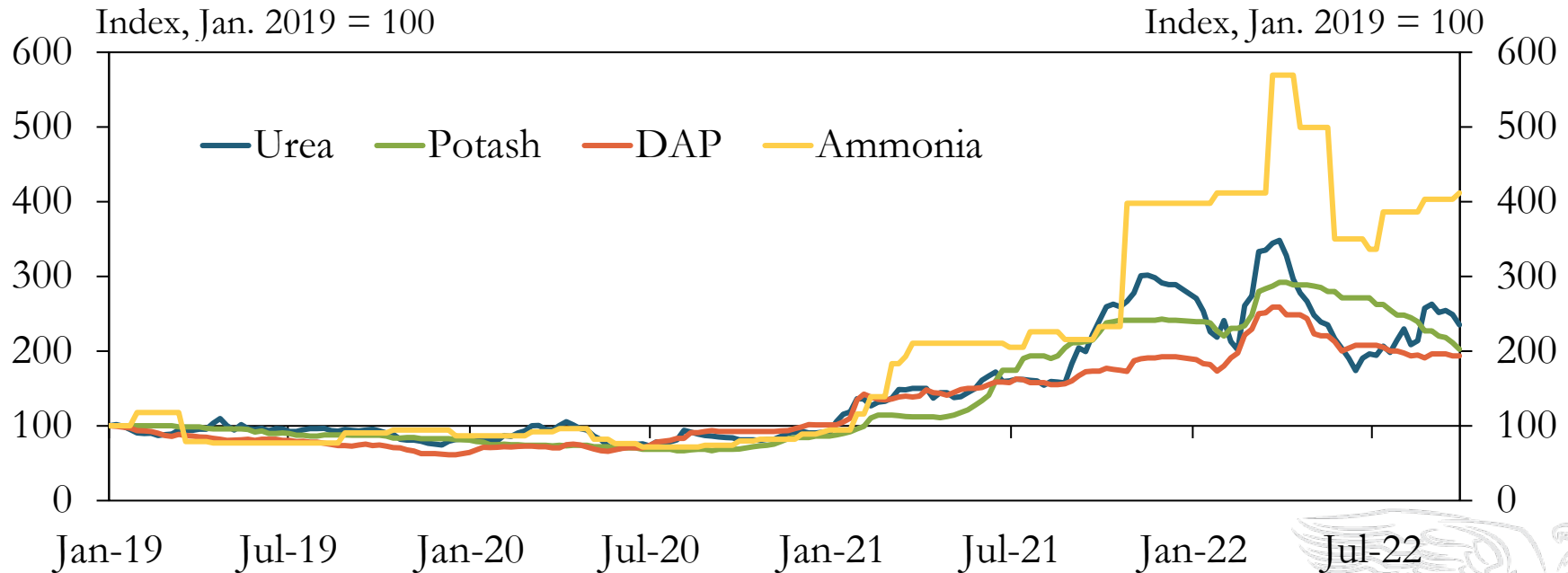


Note: The Twin Cities is the northern-most city, and Cairo-Memphis is the southern-most city for which the USDA reports barge rates.

Source: [USDA](#)

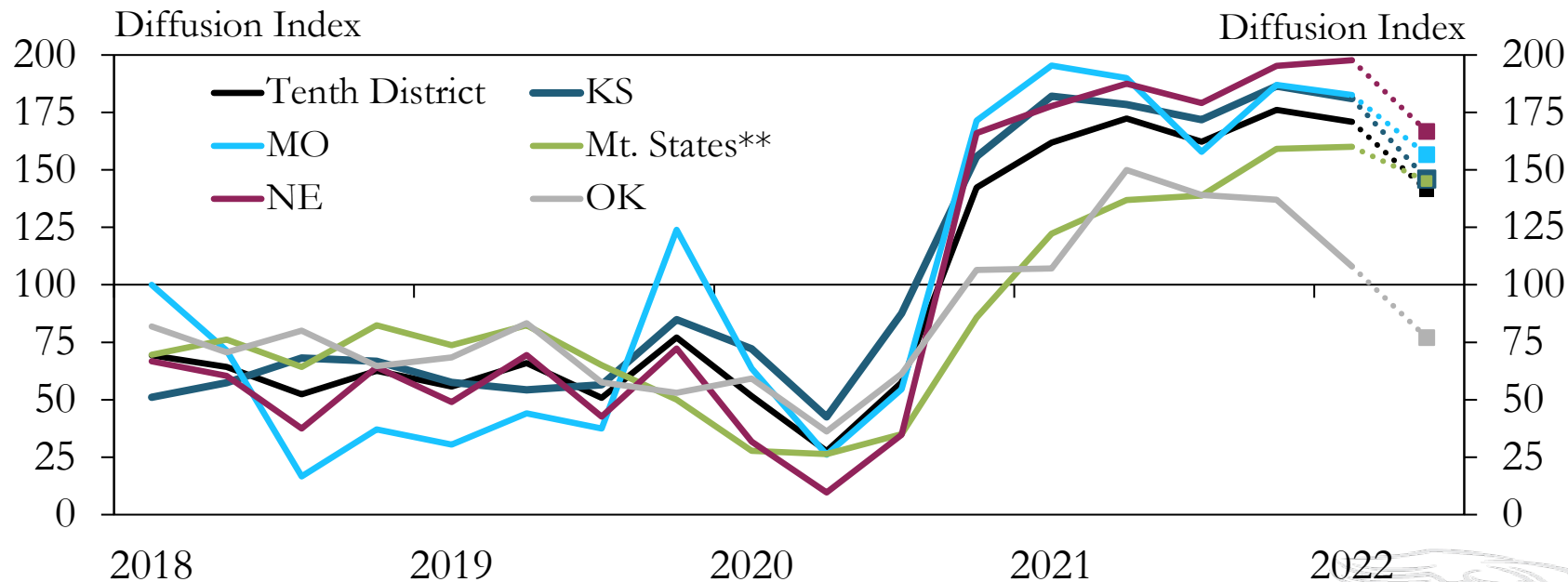
We will also monitor the movement of fertilizer in the other direction, from south to north.

Fertilizer Prices at Port in the Gulf of Mexico



Drought has likely weighed on expectations for farm income, especially in Oklahoma.

Farm Income by State



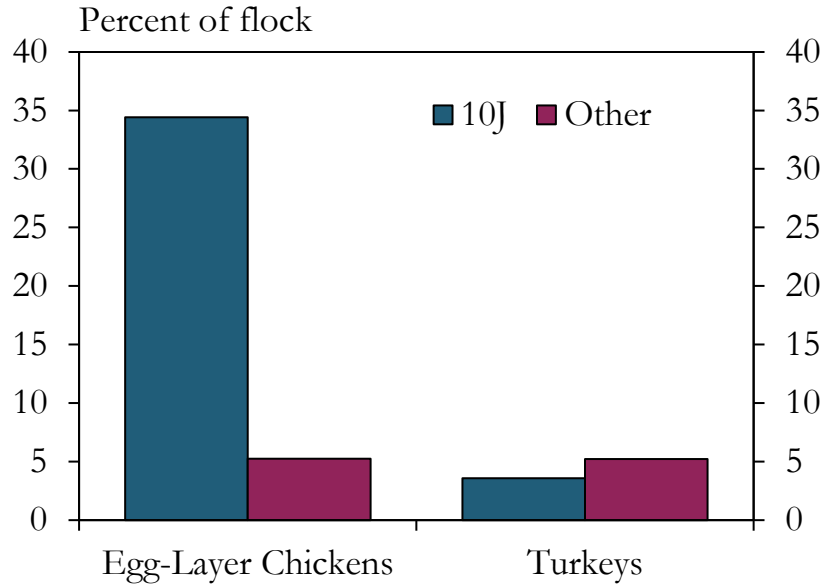
** Mountain States include Colorado, northern New Mexico and Wyoming, which are grouped because of limited survey responses from each state.

Source: Federal Reserve Bank of Kansas City.



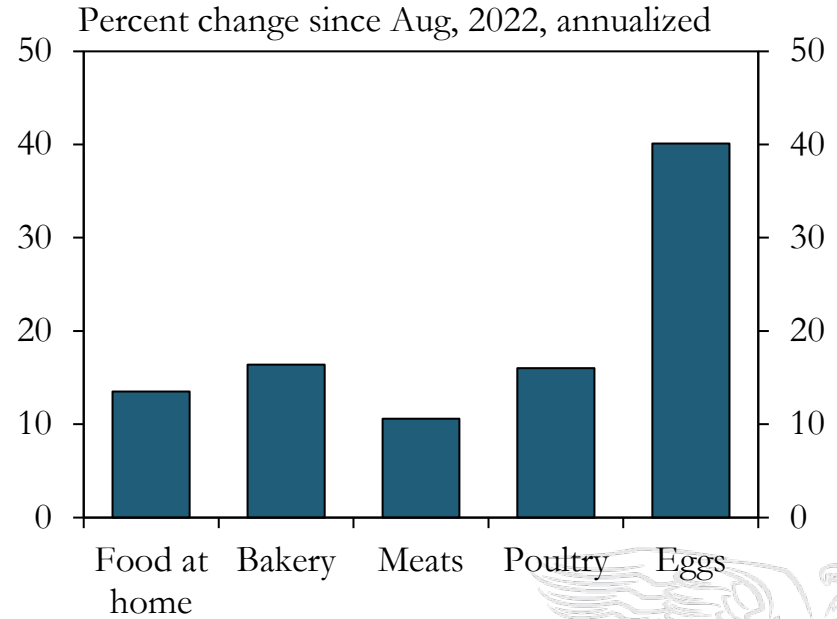
Another notable disruption has been Avian Flu, which spread rapidly and had a notable impact on egg and poultry prices.

Avian Flu Deaths,
Year-to-Date through May 2022



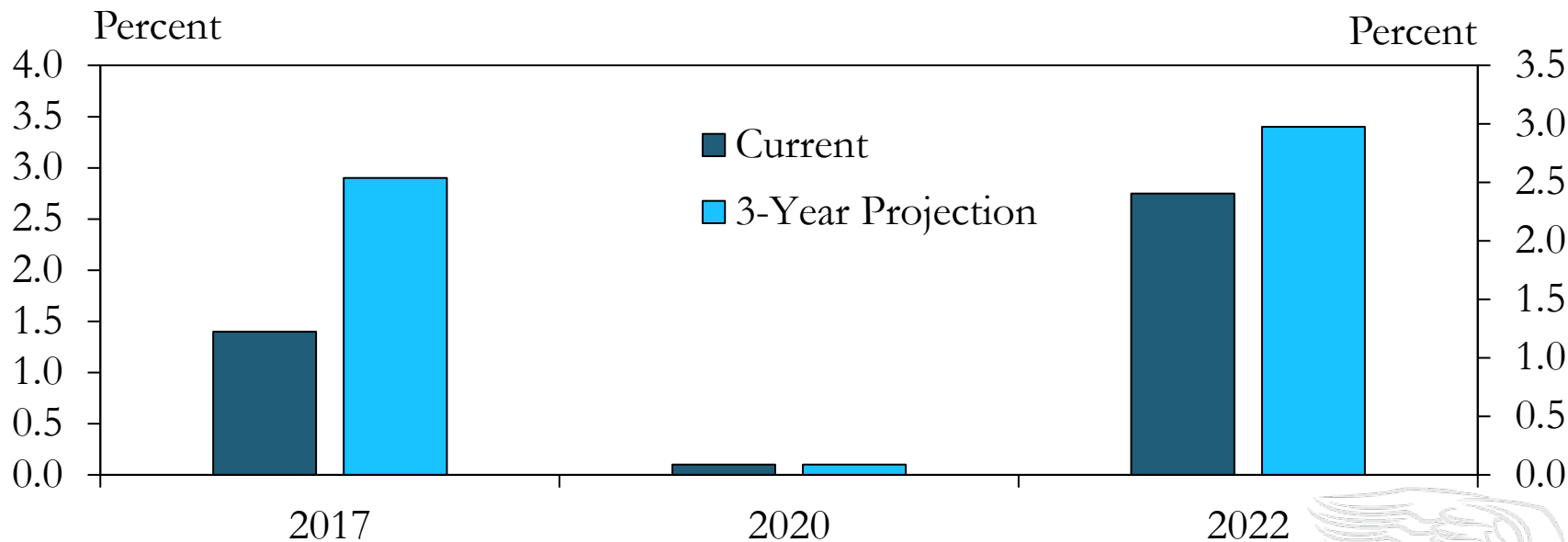
Source: USDA (Gro Intelligence)

Food Inflation



Expectations of long-term interest rates declined in the aftermath of the pandemic but have risen more recently.

Median Federal Funds Rate, June



Source: Federal Open Market Committee Summary of Economic Projections (Board of Governors).



Concluding Thoughts

- The outlook for 2022 is generally more optimistic than previous years but the outlook for 2023 will depend strongly on whether costs abate.
- Inflation has affected everyone along the food value chain, from producers to consumer, and key risks moving forward include
 - Ongoing supply chain disruptions and shortages
 - Tight labor markets
 - Drought
- The pandemic, weather shocks, and Russia's invasion of Ukraine have all had swift and substantial effects on commodity markets, and imbalances continue to persist in supply chains for most food and ag products.



Questions? Comments?

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<https://www.kansascityfed.org/research/agriculture>



