

# Recent trends in costs and returns of major U.S. agricultural commodities

Kate Vaiknoras Economic Research Service

#### Midwest Agricultural Conference December 3, 2024 Chicago, IL

<u>Disclaimer</u>: The findings and conclusions in this presentation are those of the author and should not be construed to represent any official USDA or U.S. Government determination or policy.

# Introduction

- Input prices increased in recent years, though some have started to fall (but remain high).
- Rising input prices affect the cost of producing crops and livestock products.
- Some commodity prices (e.g. corn and soybean prices) also increased, though have begun to fall.
- Together, these trends affect the profitability of producing agricultural products.



# Outline

- Price trends
- ERS commodity costs and returns data
  - Overview
  - Corn, soybeans
  - Cow-calf, dairy, hogs
- Summary

3

#### Price indexes, 2011 = 100 Percent



Source: USDA, National Agricultural Statistical Service, Prices Paid Surveys and Indexes

Note: NASS conducts surveys to collect information from agribusinesses on the prices producers paid for recent sales of approximately 450 key agricultural inputs.



#### **Price indexes**, 2011 = 100

Percent



Source: USDA, National Agricultural Statistical Service, Prices Paid Surveys and Indexes

Note: NASS conducts surveys to collect information from agribusinesses on the prices producers paid for recent sales of approximately 450 key agricultural inputs.



#### **Anhydrous Ammonia Price**

Dollars per ton





#### Henry Hub Natural Gas Spot Price





Source: U.S. Energy Information Administration Henry Hub Natural Gas Spot Price



7

#### U.S. corn and soybean prices



Source: USDA, Economic Research Service Oil Crops Outlook Tables November 2024, USDA, Economic Research Service Feed Grains Yearbook, and USDA, National Agricultural Statistical Service, Agricultural Prices.

Note: Years refer to marketing years which run from September to August. Estimates after vertical line (2023) are forecasted.



# Economic Research Service Commodity costs and returns (CAR)

- Production cost and returns for 12 agricultural commodities
- Total U.S. and ERS farm resource regions. For milk, state estimates are produced.
- Published every May and October.



Source: USDA, Economic Research Service farm resource regions



# Economic Research Service Commodity costs and returns (CAR)

- Estimates include:
  - Income from sales of the primary product (corn, oats, milk, etc.)
  - Value of secondary products (grazing, straw, manure, etc.).
  - Operating costs (feed, fertilizer, chemicals, etc.).
  - Allocated overhead costs (unpaid labor, general farm overhead, etc.)
  - Profitability measures (net return over total costs, net return over operating costs).
  - Costs include opportunity costs (opportunity cost of land, etc.)
- Based on data from commodity surveys as part of the USDA-Economic Research Service (ERS) and USDA-National Agricultural Statistics Service (NASS) Agricultural Resource Management Survey (ARMS).
- ARMS commodity surveys conducted every 4-10 years on a rotating basis for each commodity.



# Economic Research Service Commodity costs and returns (CAR)

- Survey year CAR estimates are developed using the ARMS commodity surveys
  - Corn: 2016, 2021
  - Soybeans: 2012, 2018
  - Cow-calf: 2008, 2018
  - Hogs: 2015, 2020
  - Milk: 2016, 2021
- Estimates for years between surveys based on price, acreage, and production changes from USDA-NASS, holding technology constant at the survey year.
- Crop cost of production forecasts made for current and subsequent year using USDA-ERS input price forecasting model.



#### Operating costs for U.S. corn & soybean production, 2023

Dollars per acre



Source: USDA, Economic Research Service, Commodity Costs and Returns

Note: Total 2023 operating costs were \$257.75 for soybeans and \$479.74 for corn.



#### Allocated overhead costs for U.S. corn & soybean production, 2023

Dollars per acre



Source: USDA, Economic Research Service, Commodity Costs and Returns

Note: Total 2023 allocated overhead costs were \$380.22 for soybeans and \$429.06 for corn.



#### U.S. corn production costs and returns

Dollars per acre



Source: USDA, Economic Research Service, Commodity Costs and Returns

Note: Cost estimates after vertical line (2023) are forecasted.



#### U.S. soybean production costs and returns

Dollars per acre



Source: USDA, Economic Research Service, Commodity Costs and Returns

Note: Cost estimates after vertical line (2023) are forecasted.



#### Operating costs for U.S. soybean production

Dollars per acre



Source: USDA, Economic Research Service, Commodity Costs and Returns.

Note: Cost estimates after vertical line (2023) are forecasted. 'Other' category includes custom services; fuel, lube, and electricity; purchased irrigation water; and interest on operating capital.



#### Allocated overhead costs for U.S. soybean production





Capital recovery of machinery and equipment — General farm overhead = · Opportunity cost of land — Otł
Source: USDA, Economic Research Service, Commodity Costs and Returns.

Note: Cost estimates after vertical line (2023) are forecasted. 'Other' category includes hired labor; opportunity cost of unpaid labor; and taxes and insurance.



# Livestock

- Feed costs dominate operating cost category (2023):
  - 77% of operating costs for milk.
  - 67% of operating costs for cow-calf.
  - 50% of operating costs for hogs.
- Crop prices used to estimate homegrown feed costs.
- Allocated overhead costs:
  - Cow-calf have higher allocated overhead costs than operating costs, dominated by unpaid labor and capital recovery of machinery & equipment.
  - Hogs & milk: allocated overhead costs are lower than operating costs. The biggest category is capital recovery of machinery & equipment.



#### U.S. cow-calf production costs and returns



Source: USDA, Economic Research Service, Commodity Costs and Returns



#### Operating costs for U.S. cow-calf production

250 200 150 100 50 2012 2016 2020 Cattle for backgrounding — Grazed feed = Homegrown harvested feed — Other Purchased feed

Dollars per cow

Source: USDA, Economic Research Service, Commodity Costs and Returns.

Note: 'Other' category includes custom services; fuel, lube, and electricity; interest on operating capital; veterinary and medicine; bedding and litter; marketing; and repairs.



#### Allocated overhead costs for U.S. cow-calf production

Dollars per cow



- Opportunity cost of unpaid labor - Capital recovery of machinery and equipment • Other

Source: USDA, Economic Research Service, Commodity Costs and Returns.

Note: 'Other' category includes hired labor; opportunity cost of land; taxes and insurance; and general farm overhead.



#### U.S. milk production costs and returns

Dollars per hundredweight sold



Source: USDA, Economic Research Service, Commodity Costs and Returns



#### U.S. hog production costs and returns

Dollars per hundredweight gain



Source: USDA, Economic Research Service, Commodity Costs and Returns



# Things to keep in mind

- Technology, production practices change over time.
  - The share of soybean acres receiving nitrogen, phosphorous, potassium, and fungicide, and the use of most precision technologies, increased from 2006 to 2018 (Vaiknoras & Hubbs, 2023).
- Costs and returns are heterogeneous.
  - Costs vary widely by size of operation (Gillespie et al., 2023). In 2018:
    - For operations with 20-49 cows, total costs averaged \$2,099 per cow.
    - For operations with >500 cows, total costs averaged \$910 per cow.



# Summary

- Input prices have risen, leading to higher costs of production for agricultural commodities.
  - Large spikes in fertilizer, chemicals, fuel in 2021-2022.
  - Costs growth has slowed, and in some cases fell slightly in 2023 but costs remain high.
  - Cost forecasts for 2024, 2025 (corn, soybeans) have slight declines, but remain high.
- Corn and soybean prices increased from 2019-2022, contributing to higher returns.
- Corn and soybean returns fell in 2023. Prices are forecasted to fall in 2024/2025 marketing year.



# Summary

- High crop prices in recent years contributed to higher feed costs for livestock 2021-2022.
  - A large cost category for livestock.
  - In 2023, input costs fell or leveled off, in line with falling crop prices.
- Returns also rose in some years but fell in 2023 for hogs and milk.
- Future profitability for all commodities will depend on trends in costs and returns.



# Thank you

- Any questions?
- See Economic Research Service Commodity Costs and Returns data product for estimates for more commodities and years:

https://www.ers.usda.gov/data-products/commodity-costs-and-returns/



### References

Gillespie, J., Whitt, C., & Davis, C.G. (2023). *Structure, management practices, and production costs of U.S. beef cow-calf farms* (Report No. ERR-321). U.S. Department of Agriculture, Economic Research Service.

U.S. Department of Agriculture, Agricultural Marketing Service (ARS). 2024. Iowa Production Cost Report, U.S. Department of Agriculture, Washington, DC.

U.S. Department of Agriculture, Economic Research Service (ERS). 2024. Commodity Costs and Returns Data, U.S. Department of Agriculture, Washington, DC.

U.S. Department of Agriculture, Economic Research Service (ERS). 2024. Feed Grains Yearbook, November. U.S. Department of Agriculture, Washington, DC.

U.S. Department of Agriculture, Economic Research Service (ERS). 2024. Oil Crops Outlook Tables, November. U.S. Department of Agriculture, Washington, DC.



### References

U.S. Department of Agriculture, National Agricultural Statistics Service (NASS). 2024. Agricultural Prices, U.S. Department of Agriculture, Washington, DC.

U.S. Department of Agriculture, National Agricultural Statistics Service (NASS). 2024. Crop Production, U.S. Department of Agriculture, Washington, DC.

U.S. Department of Agriculture, National Agricultural Statistics Service (NASS). 2024. Prices Paid Surveys and Indexes, U.S. Department of Agriculture, Washington, DC.

U.S. Department of Energy, Energy Information Administration. 2024. Henry Hub Natural Gas Spot Price.

Vaiknoras, Kate, and Todd Hubbs. June 2023. Characteristics and Trends of U.S. Soybean Production Practices, Costs, and Returns Since 2002, ERR-316, U.S. Department of Agriculture, Economic Research Service

