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The Effects of the 2022-2023 Highly Pathogenic Avian Influenza (HPAI) Outbreak on U.S. Poultry Exports

Samantha Padilla and Quinton Baker

Selected presentation for the International Agricultural Trade Research Consortium's (IATRC's) 2023 Annual Meeting: The Future of (Ag-) Trade and Trade Governance in Times of Economic Sanctions and Declining Multilateralism, December 10-12, 2023, Clearwater Beach, FL.

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Economic Research Service
U.S. DEPARTMENT OF AGRICULTURE

The Effects of the 2022–2023 Highly Pathogenic Avian Influenza (HPAI) Outbreak on U.S. Poultry Exports

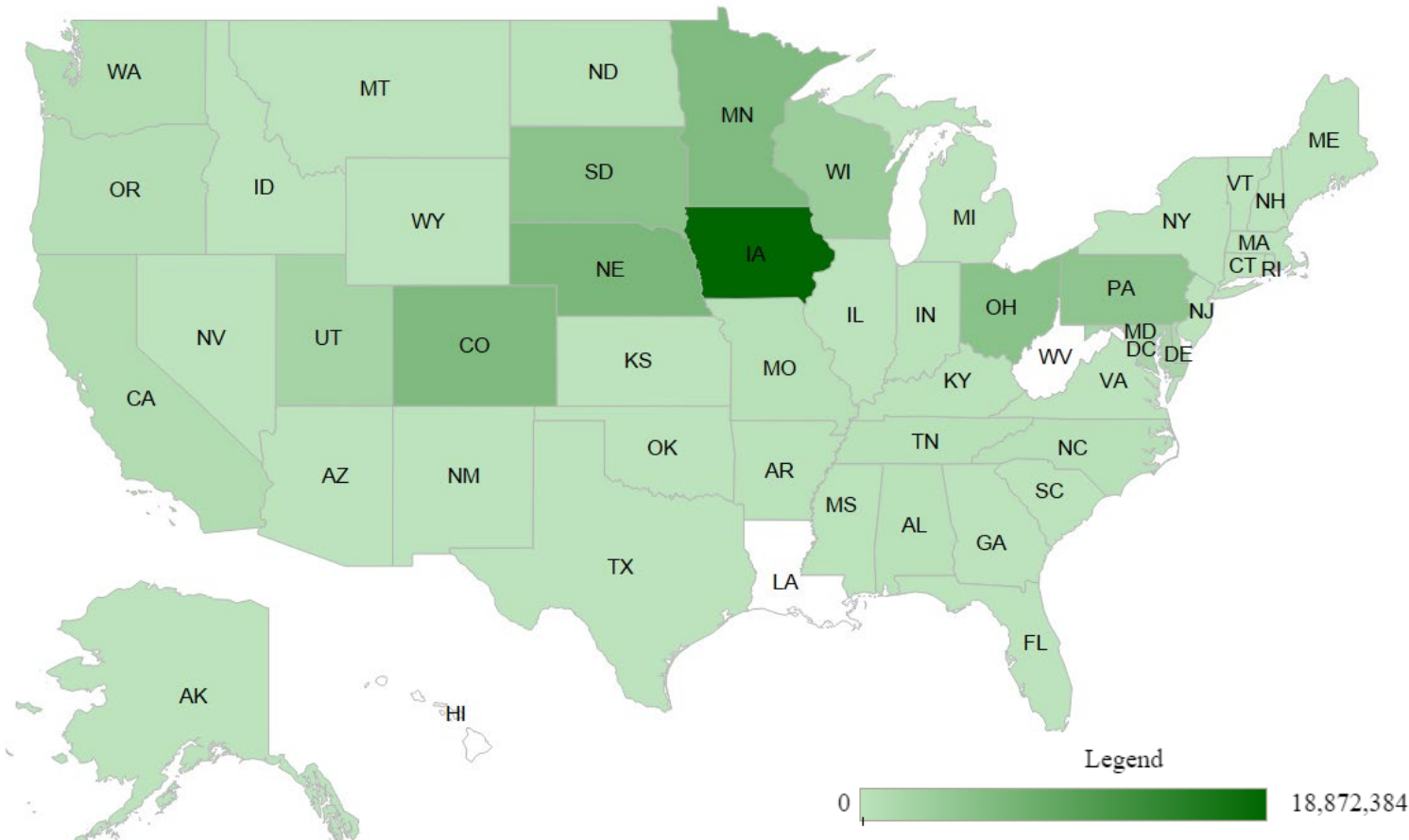
Samantha Padilla and Quinton Baker
USDA Economic Research Service

IATRC Meeting
December 10, 2023

The findings and conclusions are those of the authors and should not be construed to represent any official USDA or U.S. policy or determination



HPAI cases concentrated in the Midwest, with 27 percent of cases in Iowa and 11 percent in Nebraska



- 68.4 million birds affected across 47 States since 2022.
- Iowa has had the most birds affected at 18.9 million, followed by Nebraska with 6.7 million.



International response to HPAI: Export restrictions on U.S. poultry

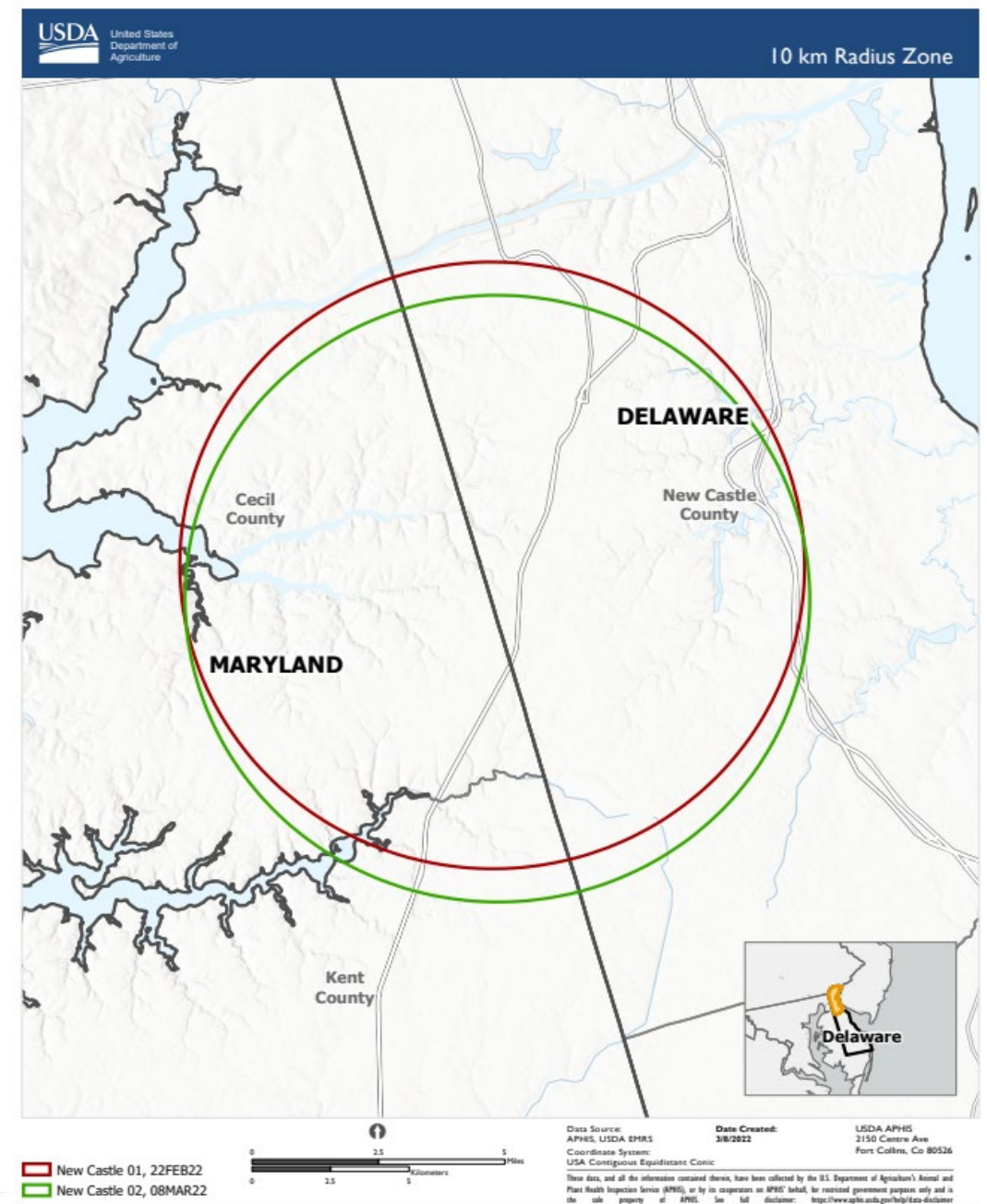
- Several countries adopted export restrictions on U.S. poultry meat and products- either at the county-, State- or national-level.
- During the 2015 HPAI outbreak, more trading partners relied on national- and State-level restrictions.
- For the 2022-2023 outbreak, more countries adopted policies of only banning poultry from localized “zones” or counties.



Example: localized restriction

- Example of two localized restrictions Canada has in New Castle County, DE.
- Each circle represents a 10 km radius restricted zone

Source: FSIS Import & Export Library



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Research questions

1. What are the average effects of trade restrictions on exports during the 2022-2023 HPAI outbreak?
2. How important are heat exemptions when a country imposes a trade restriction?



Data sources

We use several data sources to construct a **monthly panel of State-country export values that includes aggregated trade restrictions** on poultry meat and products:

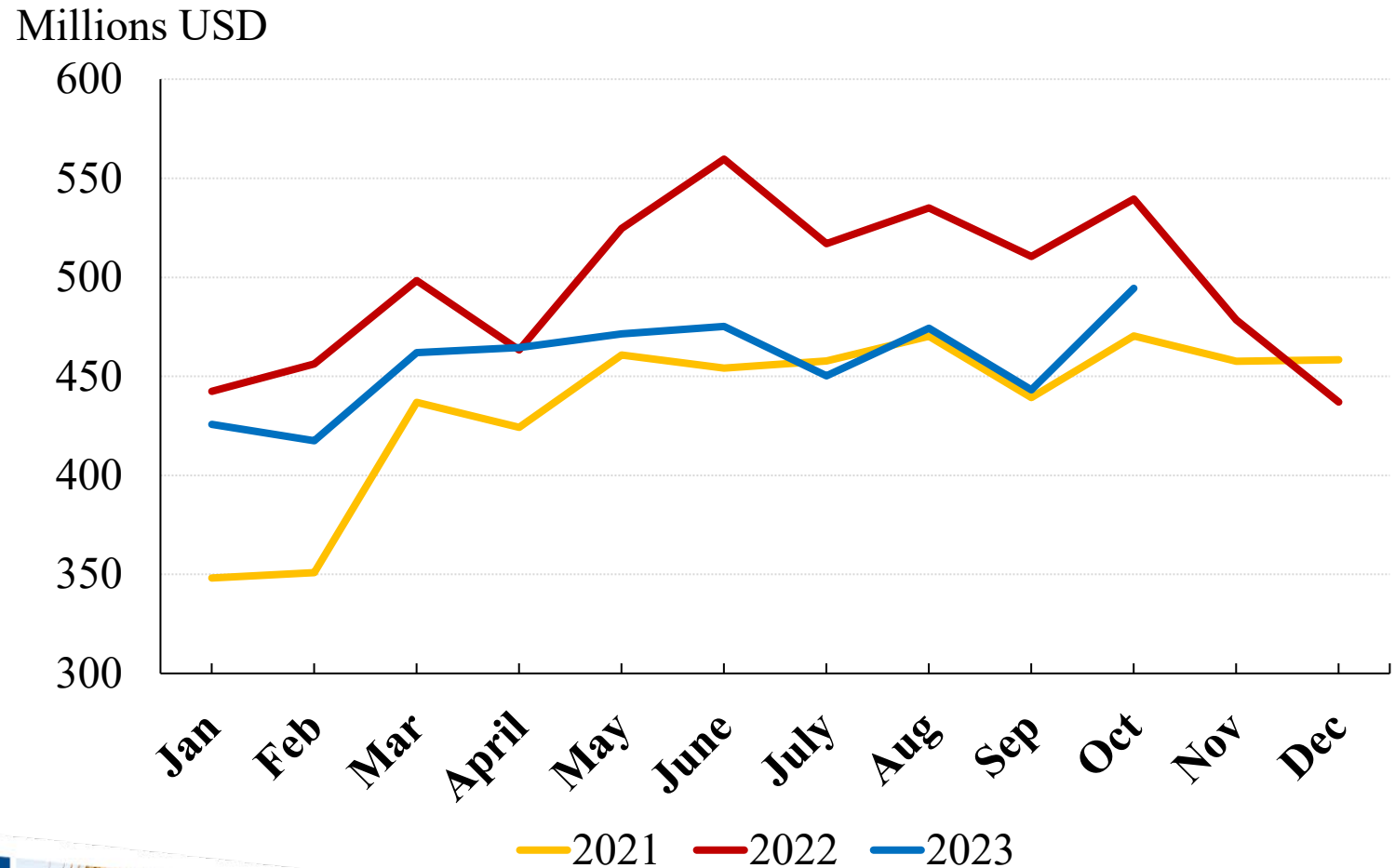
1. USDA-FAS GATS monthly panel of export poultry meat values
2. USDA-FSIS Import & Export Library data on trade restrictions
3. USDA-FSIS Meat, Poultry and Egg Product Inspection Directory
4. USDA-APHIS Confirmations of HPAI



USDA-FAS Global Agricultural Trade System (GATS) export value data

Export value of poultry
meat and products:

- January 2021 - October 2023
- Monthly, U.S. State level export data



2022-23 export restrictions on U.S. poultry from USDA-FSIS

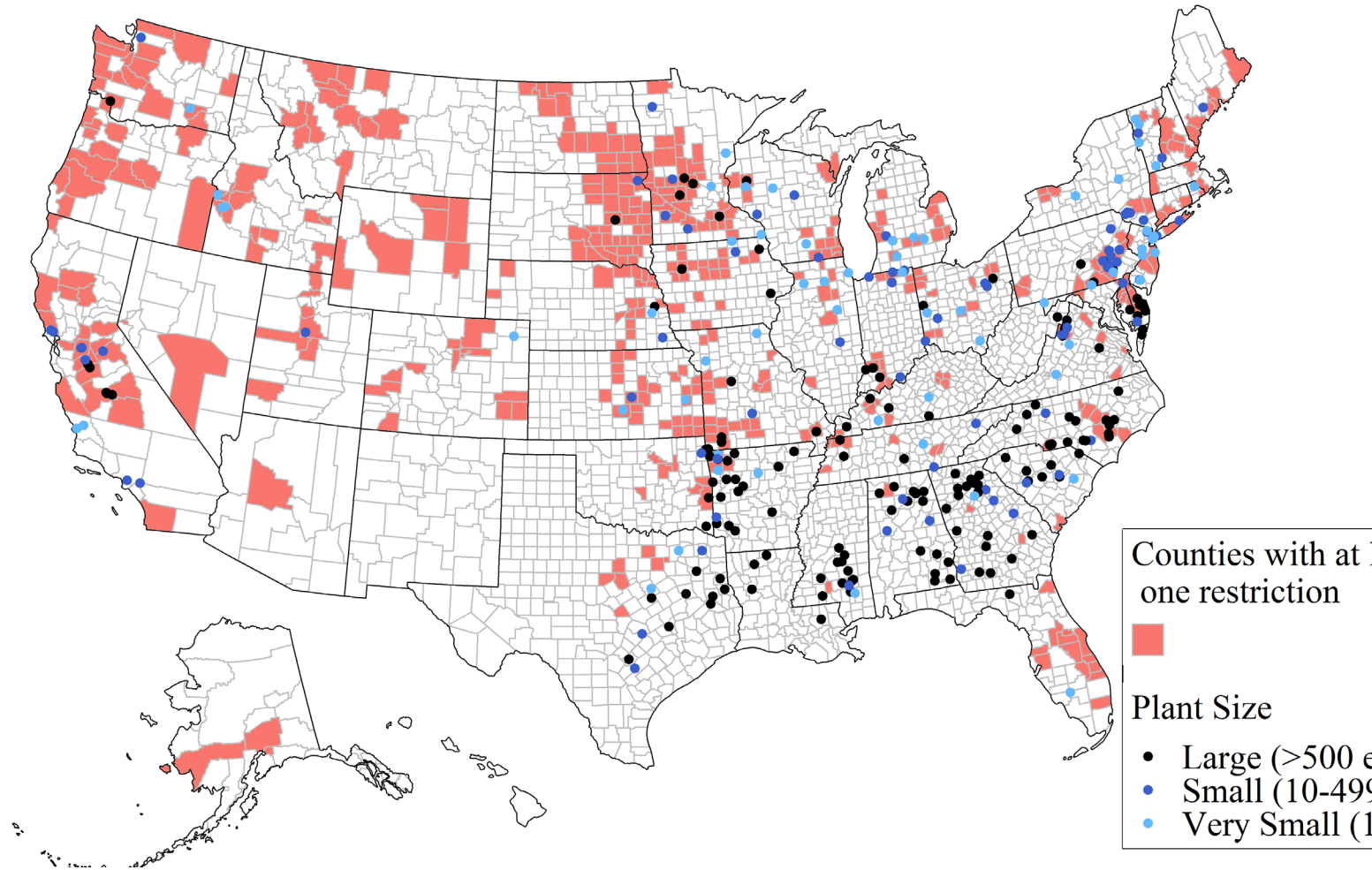
- Majority of restrictions were at the county level
- 80% of restrictions have an end date

Variable	Mean	SD
Pct of county-level restrictions	66.1	47.3
Pct of State-level restrictions	24.2	42.8
Pct of national-level restrictions	9.6	29.5
Pct of heat exemption	51.2	49.9
Average duration (days)	170	118.4
Share of 2022 exports under restriction	0.20	0.39
Share of 2023 exports under restriction	0.14	0.35



USDA-FSIS Meat, Poultry and Egg Product Inspection Directory

- We use this data to calculate the percent of poultry slaughter plants in restricted counties at the state level.



Sources: FSIS Import & Export Library and FSIS Meat, Poultry and Egg Product Inspection Directory



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1. Methods: Exploring the disaggregated types of restrictions and their effect on poultry exports

$$Value_{ijt} = \alpha + \beta_1 CountyRes_{ijt} + \beta_2 StateRes_{ijt} + \beta_3 NatRes_{ijt} + \gamma pctSlaughter_{ijt} + \delta Birds_{it} + month + state + \epsilon_{ijt}$$

$CountyRes_{ijt}$ – County-level restrictions imposed on state i by country j in month t

$StateRes_{ijt}$ – State-level restrictions

$NatRes_{ijt}$ – National-level restrictions

$Slaughter_{ijt}$ – Pct of poultry plants in restricted areas in state i in month t

$Birds_{it}$ – Number of turkey and broiler with HPAI in state i in month t

$month, state$ – State and month dummies



2. Conditional on a restriction being in place, what is the effect of a country adopting a heat exemption

$$Value_{ijt} = \alpha + \theta HeatExempt_{ijt} + \beta_1 CountyRes_{ijt} + \beta_2 StateRes_{ijt} + \beta_3 NatRes_{ijt} + \gamma pctSlaughter_{ijt} + \delta Birds_{ijt} + month + state + \epsilon_{ijt}$$

$\theta HeatExempt_{ijt} = 1$ – Heat-treated poultry is exempt from country's j restriction on State i in month t

- Estimation method: fixed effects.



Preliminary results

- State restrictions had the largest negative effect on export value.
- If there is a restriction in place, exemptions on heated-treated poultry increase poultry meat exports.

VARIABLES	(1) Entire Sample	(2) With Restriction
County restrictions	-60.07*** (22.16)	614.3*** (207.0)
State restrictions	-519.6*** (154.3)	514.4** (212.9)
National restrictions	-122.3*** (31.36)	
% slaughter plants in restricted counties	0.0958 (0.440)	-1.416 (1.269)
Number of birds with HPAI in state	0.0670 (0.0495)	0.128 (0.124)
Exemption on heat-treated poultry		387.3** (193.0)
Constant	1,078*** (328.8)	998.8 (1,246)
Observations	37,120	3,679
Number of ID	1,547	583
State FE	YES	YES
Month FE	YES	YES
Year FE	YES	YES



Next steps

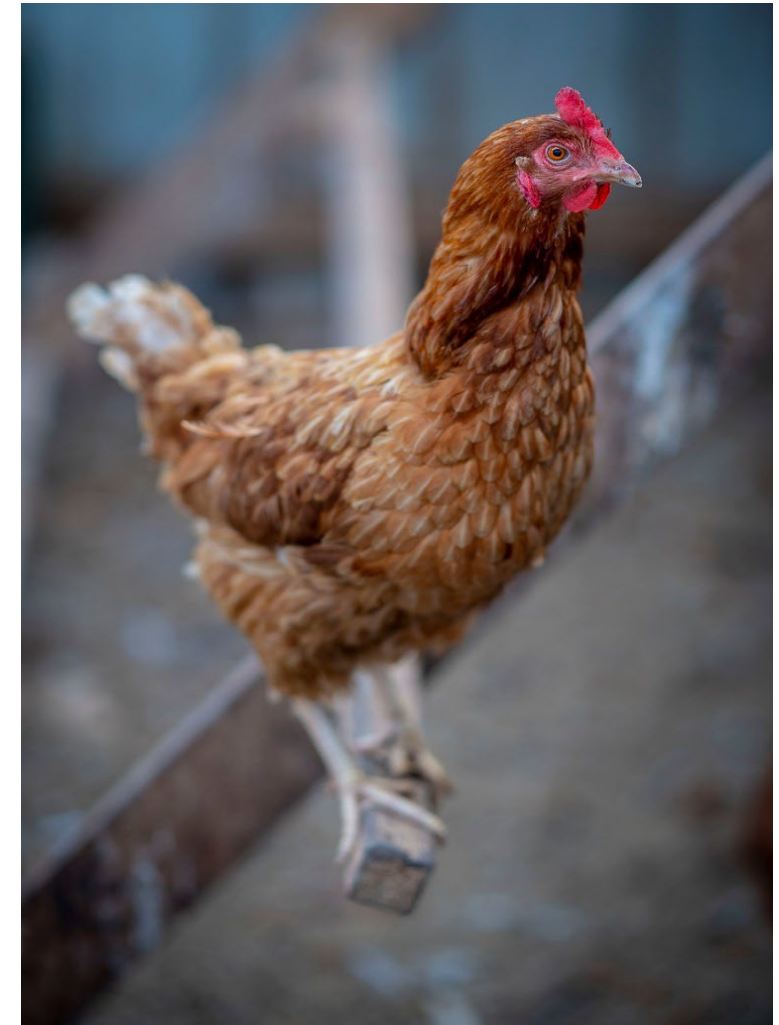


- Robustness checks.
- Alternative specifications.
- Access monthly, state-level export quantity data.
- Incorporate cooked poultry exemptions into the data.
- Poultry prices.



Takeaway

- The future trade environment for poultry products will depend on HPAI detections.
- Reducing or eliminating current trade restrictions, among other factors such as a trading partner allowing exemptions on heat-treated poultry, may improve export outcomes for the United States.



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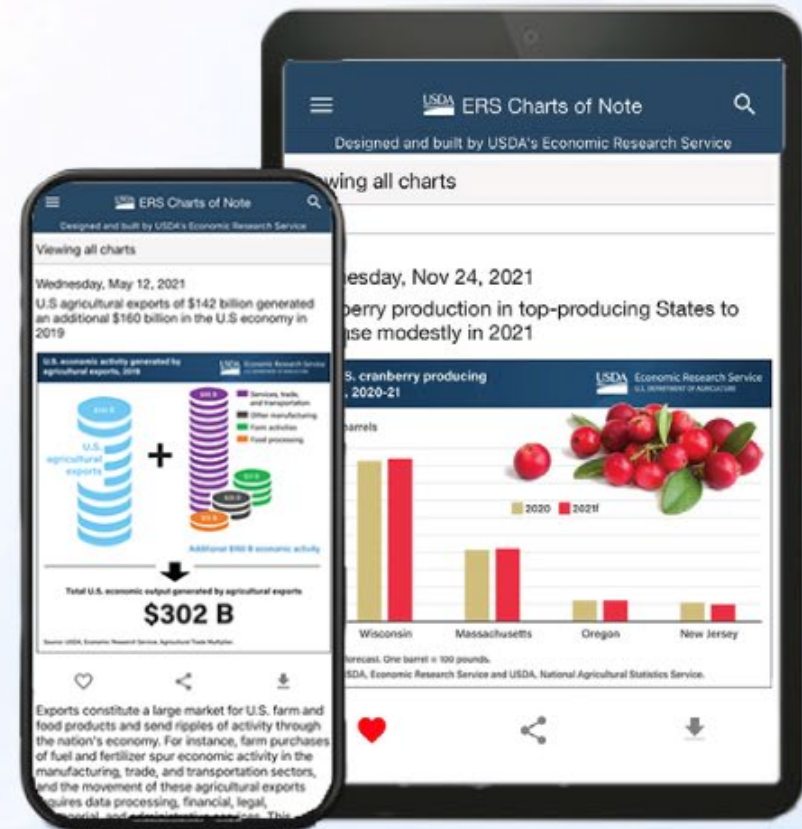
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