

Comments on Markets & Economic Assessment

Agroeconomics and Food Value Chain Incentives

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Potential Research Priorities to Inform Readiness and Response to Highly
Pathogenic Avian Influenza A (H5N1)

National Academy of Sciences, Engineering, and Medicine

October 23, 2024

Overview

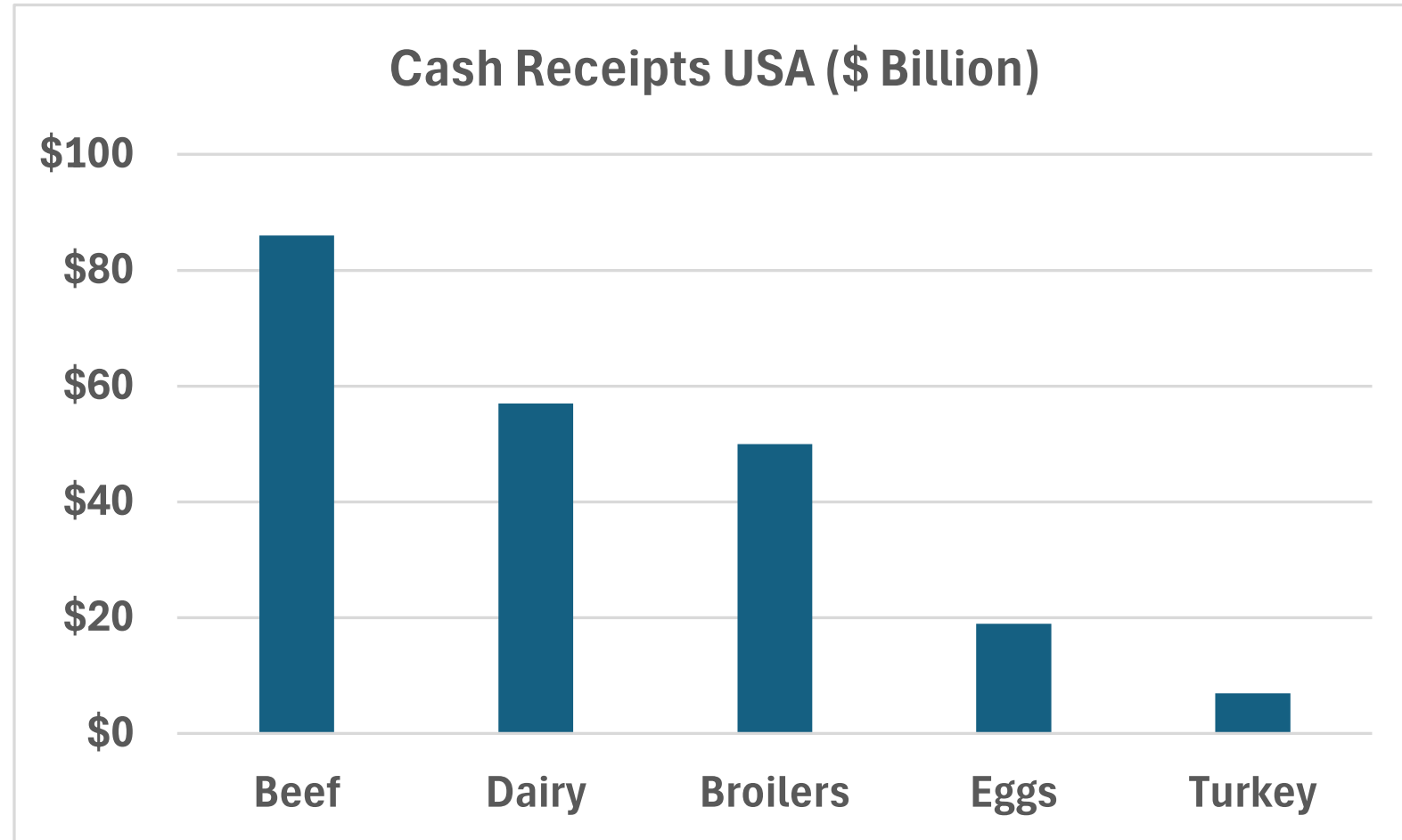
- Main economic themes
- HPAI highlights on production, trade, and economic consequences
- HPAI and dairy cows
- Gaps and barriers
- Moving forward

Three Main Economic Themes

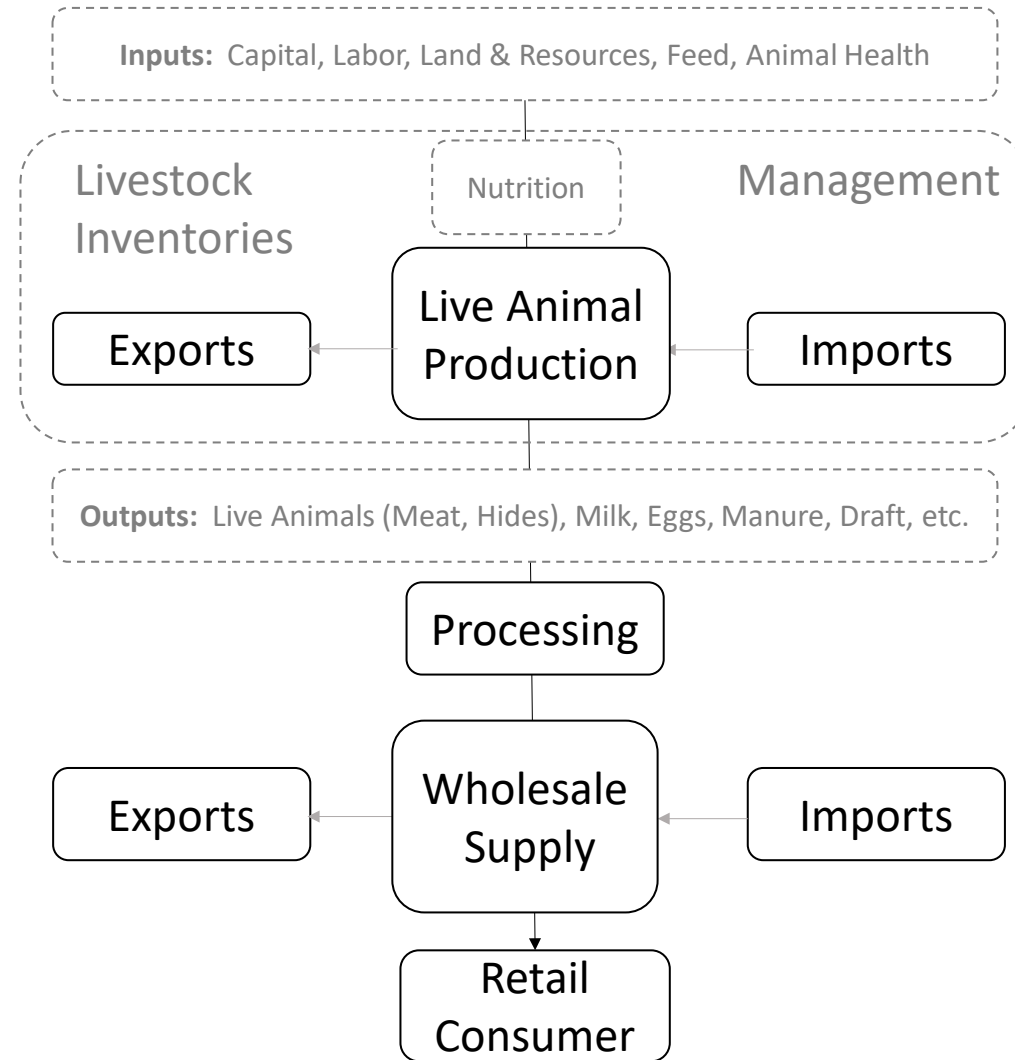
- Disease externalities impact health and distort markets along supply chains from **input suppliers** to **producers** to **processors** to **consumers**.
- Distorted markets & nonmarket impacts redistribute benefits and costs across society. There will be winners and losers. A key question is **who is burdened and by how much?**
- Effective investments and policies, as well as timely interventions by governments, are key to returning economies to efficient pathways and to sustainable trajectories that are consistent with SDGs.

USDA Statistics

- In 2022 across the globe the US was
 - top producer in broiler meat and 2nd in exports.
 - top turkey producer and top 3 in exports.
 - 3rd largest producer of eggs in the world and 2nd in exports.
 - top 5 in beef production and exports.
 - top 5 in dairy production.



Supply Chain



Farmers

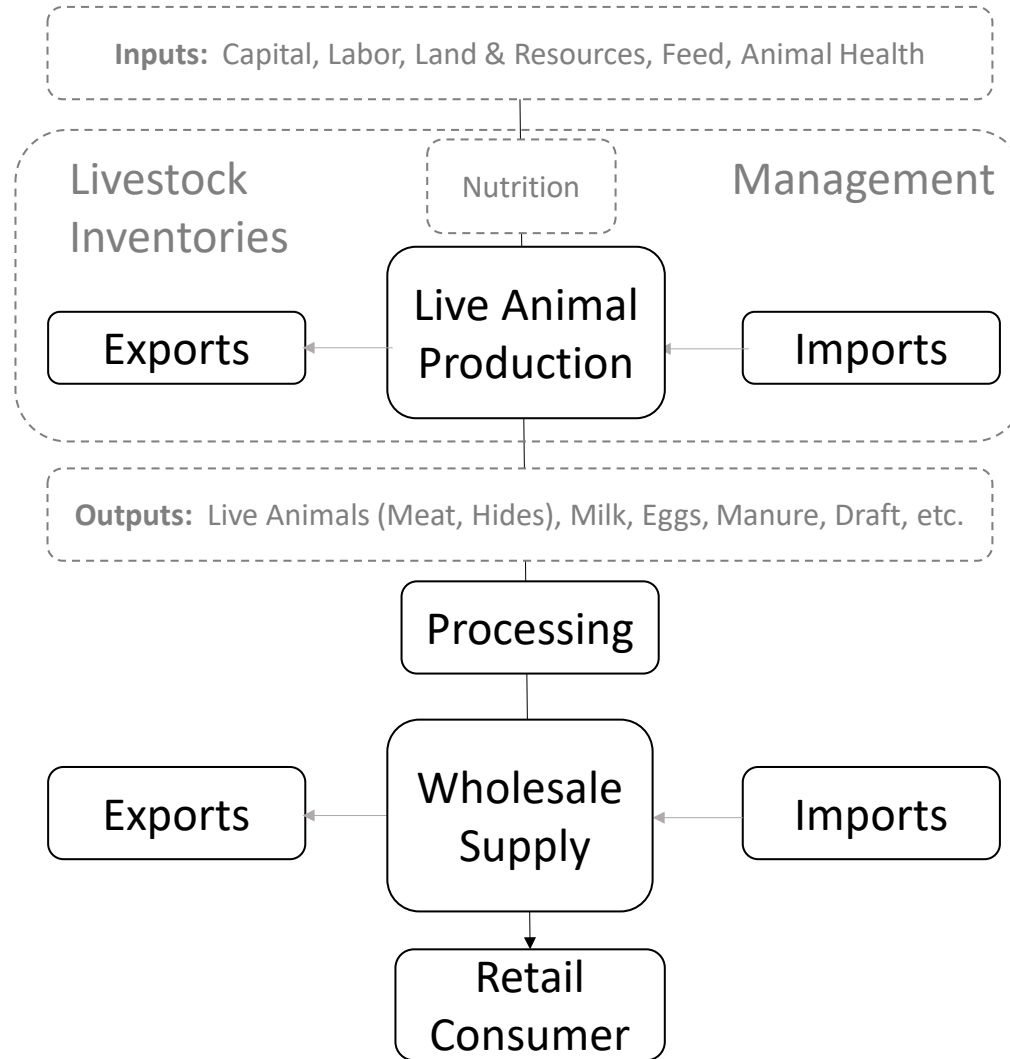
Processers

Consumers

Supply Chain

Trade Agreements

WTO Trade Rules &
Disputes
WOAH Standards

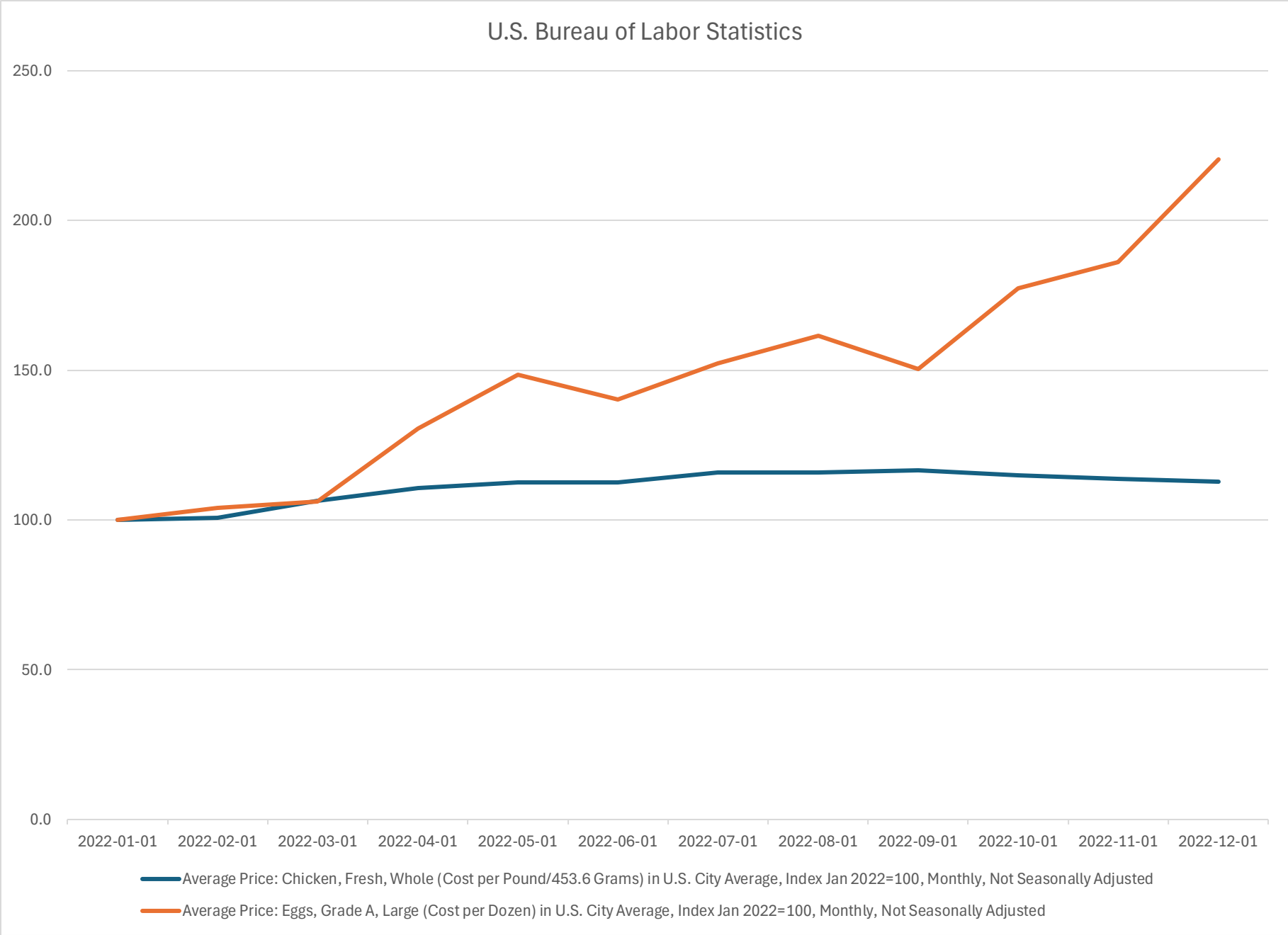


Trade Embargoes
Regionalization

Private Information &
Contracts

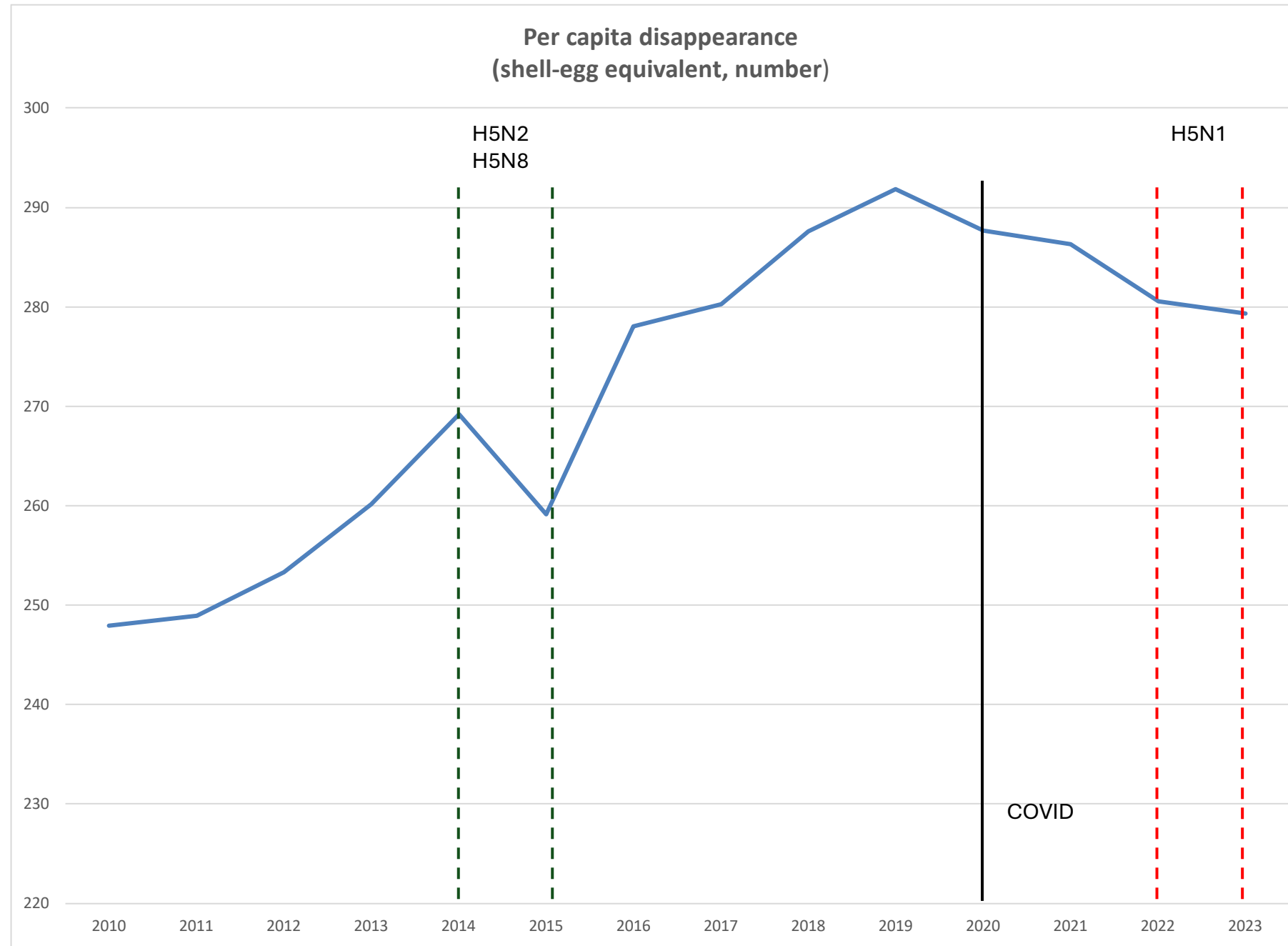
HPAI impacts on prices

Highlight:
egg prices increased dramatically during 2022 with the onset of H5N1 in the US relative to chicken meat.



What about consumers?

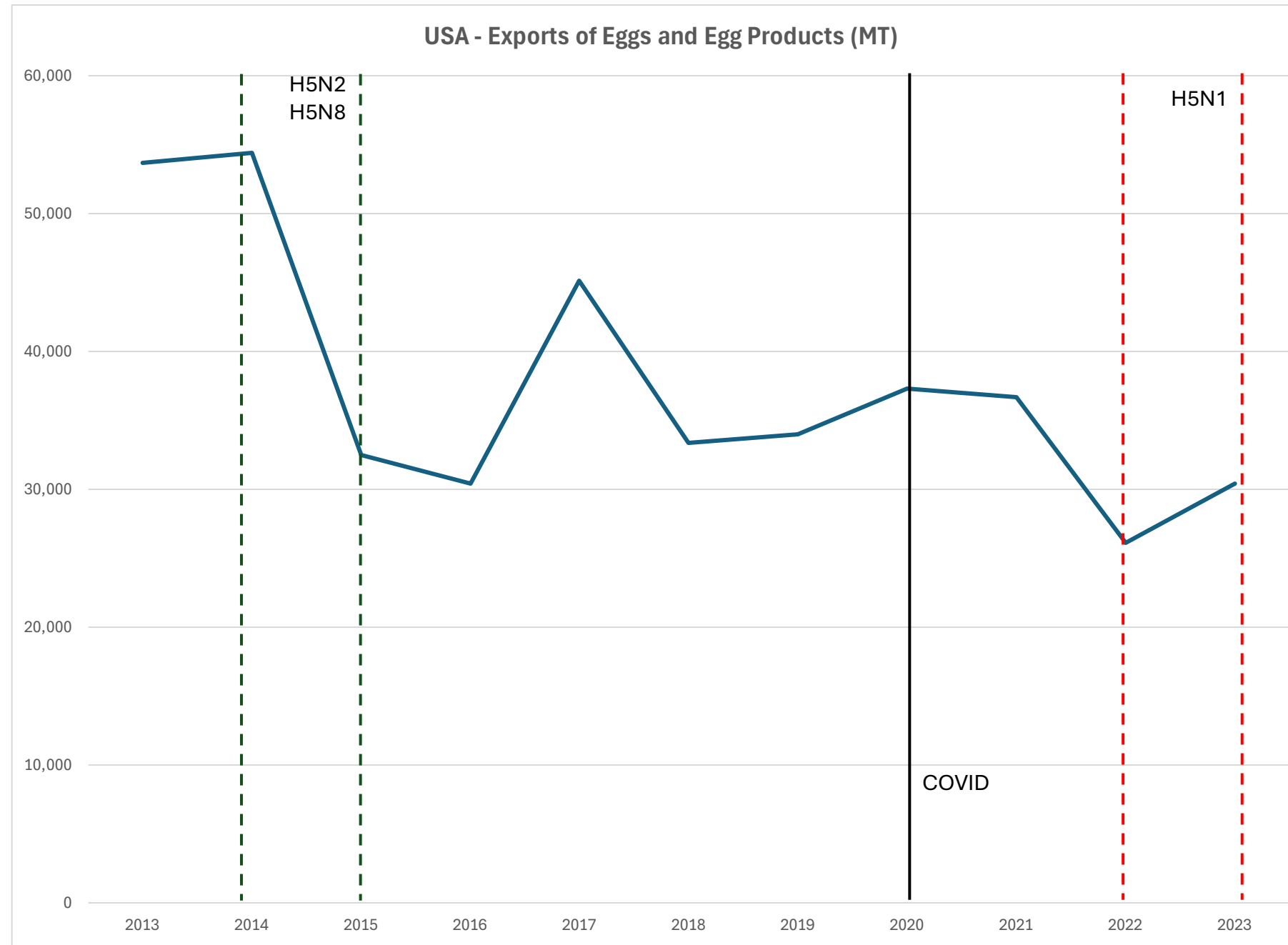
Highlight:
consumer response
to foodborne
diseases tends to be
small on average
and short-lived
(Piggott and Marsh).



Data source USDA

Trends in Exports

Highlight:
observe a reduction
in the magnitude of
shocks on trade
from HPAI events in
2014-2015 relative
to HPAI events in
2022-2023.



Who is Burdened & By How Much?

(Selected Highlights)

- Economic consequences of High Path Avian Influenza in 2014-2015
 - **total producer** welfare reduced \$1 billion ^a
 - **government expenditures** \$879 million ^b
- Preliminary estimates for High Path Avian Influenza in 2022-2023
 - **consumer** welfare fell for eggs by \$3.5 billion ^c
 - **government expenditures** \$661 million ^d

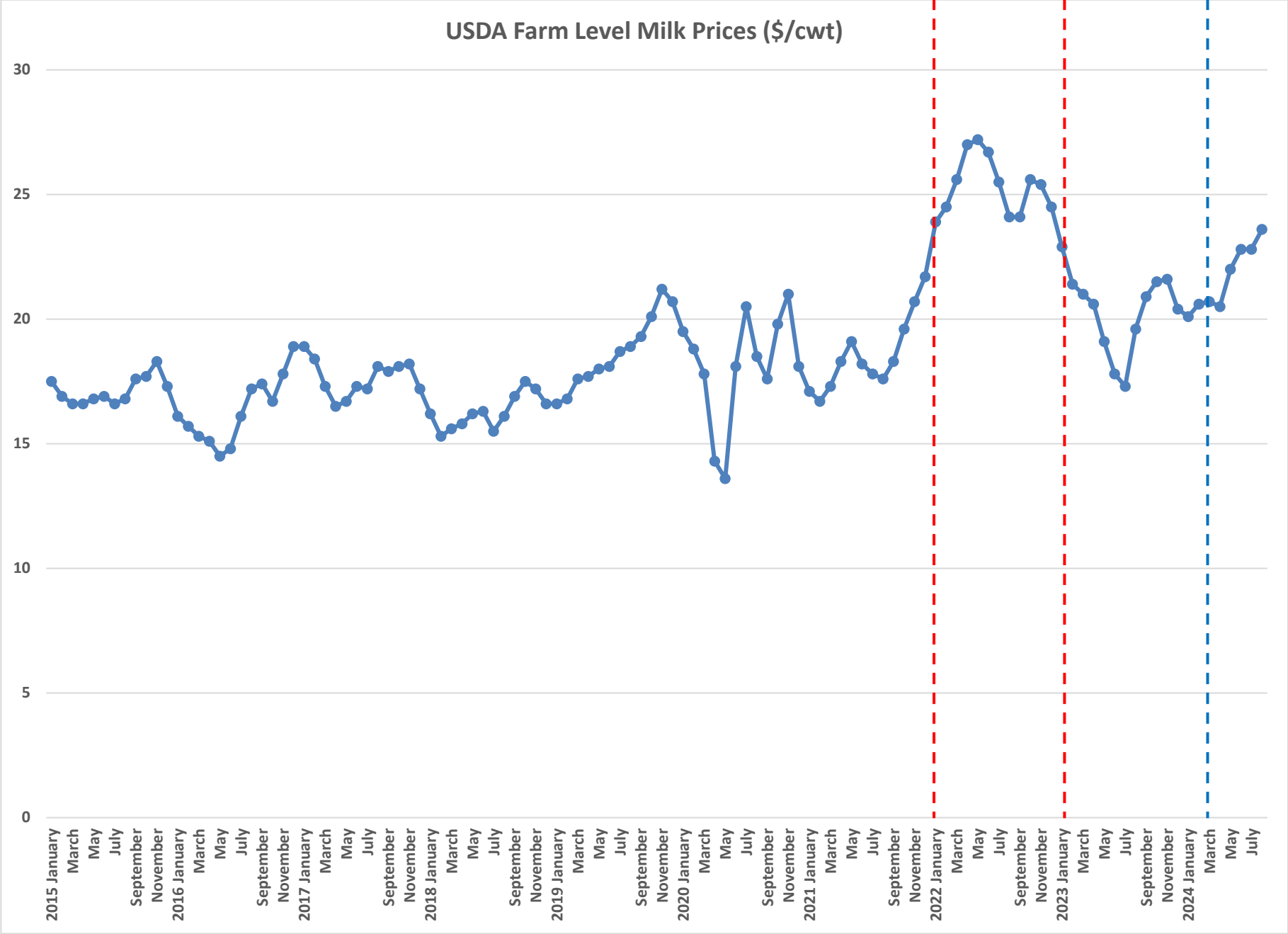
^a See Seitzinger & Paarlberg (2016). ^b Seeger et al (2020). ^c Ferrier et al (2024). ^d Funk, J. Bird flu costs pile up as outbreak enters second year. APNews Feb 19, 2023.

HPAI & US Dairy Cows

- 323 herds infected out of 26,290 certified dairies and 27 human infections in the US.
- Unlike poultry, dairy cows not necessarily culled (<2%). About 10-20% production loss over 7-14 days in infected herds.
- The Food and Drug Administration (FDA) and CDC have found that the domestic milk supply is safe because it is pasteurized.
- The WHO assesses the public health risk posed to the general population to be low and for occupationally exposed persons low to moderate.

HPAI & US Dairy Cows

- Milk market currently stable.
- Ground beef tests negative with no significant restrictions on domestic or international trade of cattle meat.
- Restrictions on dairy cow movement across state lines.
- Safety nets are provided by state and federal government programs, including disaster aid, indemnification programs, support for HPAI testing, and food aid.



Gaps & Barriers

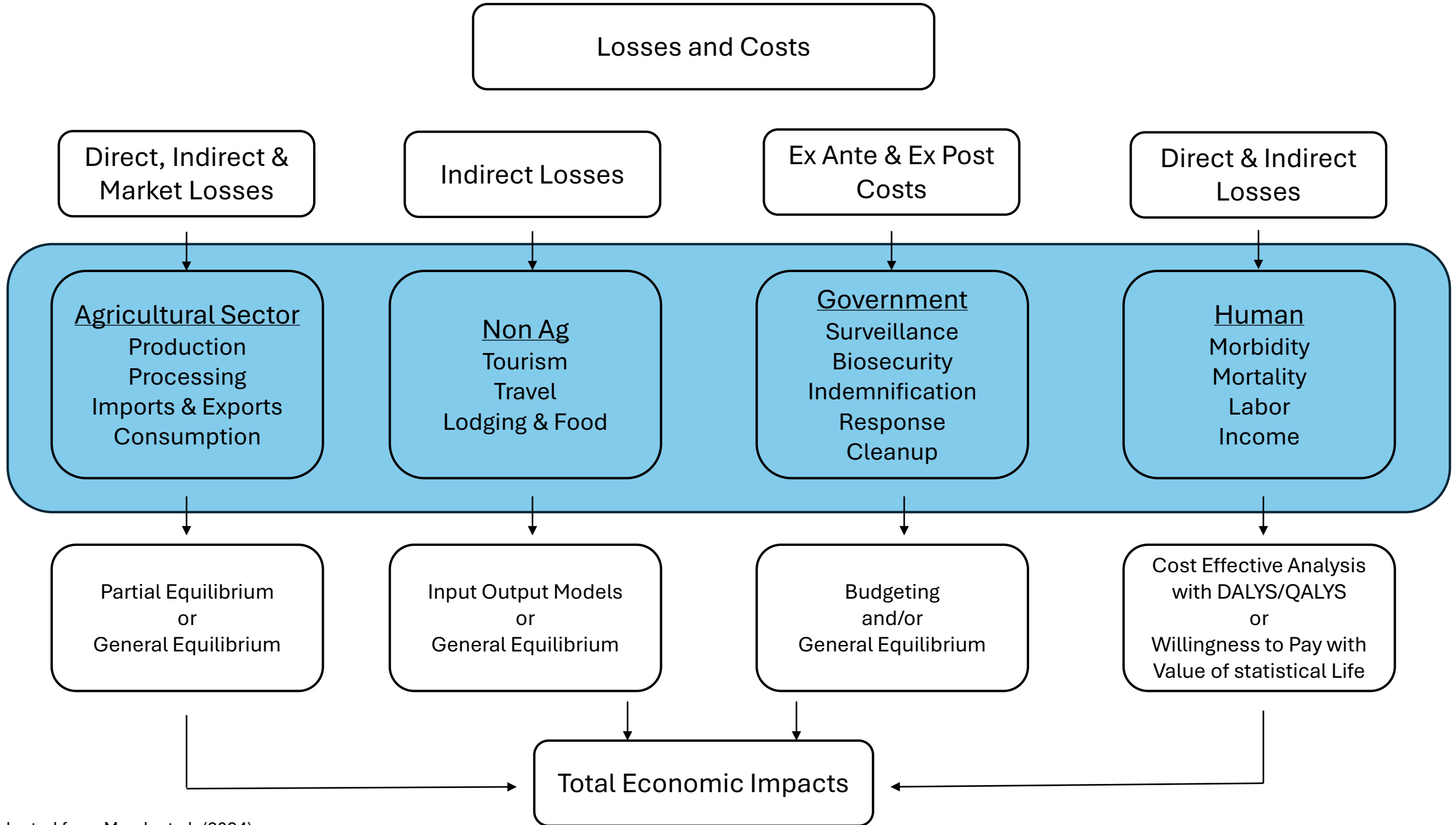
- Gaps exist in both private and public data in animal agriculture.
 - Collecting and reporting the losses in production/trade and the costs for surveillance, biosecurity, response, and cleanup presents a major challenge for the animal sector.
- Barriers exist in the uptake of safety nets and aid to producers provided by state and federal government programs.
- Gaps exist in understanding the distribution from economic burden and interventions across firms and consumers for both animal and human health.

Moving Forward

- Improve data collection/reporting of public expenditures for animal health.
 - Construct accounting systems for animal health akin to human health.
 - Strive for more equitable and efficient levels of public spending.
- Appeal to behavioral analysts/economists to help specific and identify safety nets and incentives.

Moving Forward

- Measure the distribution of economic burden for both animal and human health in a One Health Framework.
 - Update the assessment frameworks
 - to account for multi-markets model (e.g., poultry and dairy)
 - to provide more efficient, equitable, and sustainable resource allocation
 - Unify the Hennessy and Marsh (2021) and Robinson and Hammitt (2017) Benefit-Cost methods for assessment of animal health & human health, respectively
 - to directly realize the distributional impacts on firms and consumers
 - to examine the tradeoffs of a \$ investment into animal or human health
- Assess investments and interventions in a One Health Framework, including vaccinations for bird flu



Selected References

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John Clifford
Veterinary Trade
Policy Advisor
USA Poultry &
Egg Export
Council



US poultry industry position
on use of vaccine

Vaccine for H5N1

- ▶ Requires APHIS approval
- ▶ Requires State Animal Health Official approval for each State
- ▶ Highly Pathogenic Avian Influenza is a select agent. (H5 removed)
- ▶ All vaccine doses must be accounted for, and all animals vaccinated must be identified and tracked.



Poultry industry concerns

The World Organization for Animal Health allows the use of vaccine for HPAI if the country has a surveillance system that will detect virus in a vaccinated flock.

There is currently no surveillance system that is accepted internationally.

Many of the countries that vaccinate do not eradicate flocks if infected.

Exports for poultry industry

USDA, APHIS, Veterinary Services has negotiated zoning agreements with 80 countries.

When the US has an outbreak of HPAI in poultry APHIS and the State put a 10km zone around the infected premise. They depopulate the infected flock and complete surveillance in the zone to ensure no further spread.

The 80 countries will restrict poultry from the 10km, County, or State level. Majority of the agreements are at the County level.

This has allowed the industry to continue to export product during outbreaks



Poultry Exports and concerns

- ▶ Total exports of poultry is 6 billion US dollars a year.
- ▶ If US vaccinated for HPAI, the industry would be concerned of losing their export markets.
- ▶ If they lost all 80 markets it is estimated that it would cost the industry an additional \$18 billion in sales and a loss of 215,000 jobs
- ▶ In addition, if the industry was not able to recover those markets, there would be an additional cost to the soybean and corn markets of \$14 billion.



Vaccine Cost

- ▶ France has started vaccinating their duck population.
- ▶ France has indicated that the cost for vaccination and surveillance is \$105 million in US dollars for 64 million birds.
- ▶ If we use the same cost estimate in the US, it will cost \$341 million to vaccinate 208 million turkeys.
- ▶ It would cost \$604 million for 368 million layers.
- ▶ There is concern that the surveillance that is being done by France is not adequate and there would be additional cost for surveillance.
- ▶ The US government is spending about \$450 million a year on eradication.



**VACCINATION
COSTS**

Vaccine cost continued

- ▶ IF a vaccinated flock(s) are is found to be infected in the US it will still be depopulated.





Poultry industry position on use in Dairy Cattle

- ▶ I cannot speak for entire industry; however, I have not heard of anyone in the industry objecting to its use in dairy cattle as long as APHIS can guarantee with our trading partners that are markets will remain open.
- ▶ I know that the current belief in APHIS is that the virus is spread by milk and with good biosecurity, testing and movement controls the virus can be eliminated without the use of vaccine.
- ▶ More work needs to be done to ensure that this is the only route of spread.

Questions ?



Learnings, Opportunities and Gaps

Dustin Oedekoven, DVM, DACVPM
Chief Veterinarian
National Pork Board





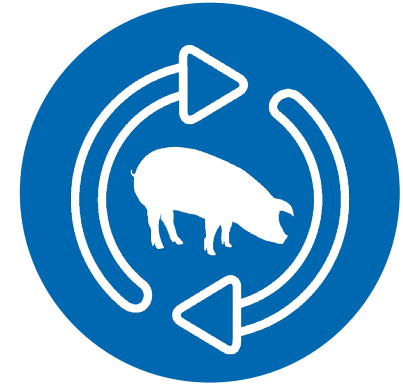
Our Ethical Principles



Environment



Food Safety



Animal Well-being



Our People

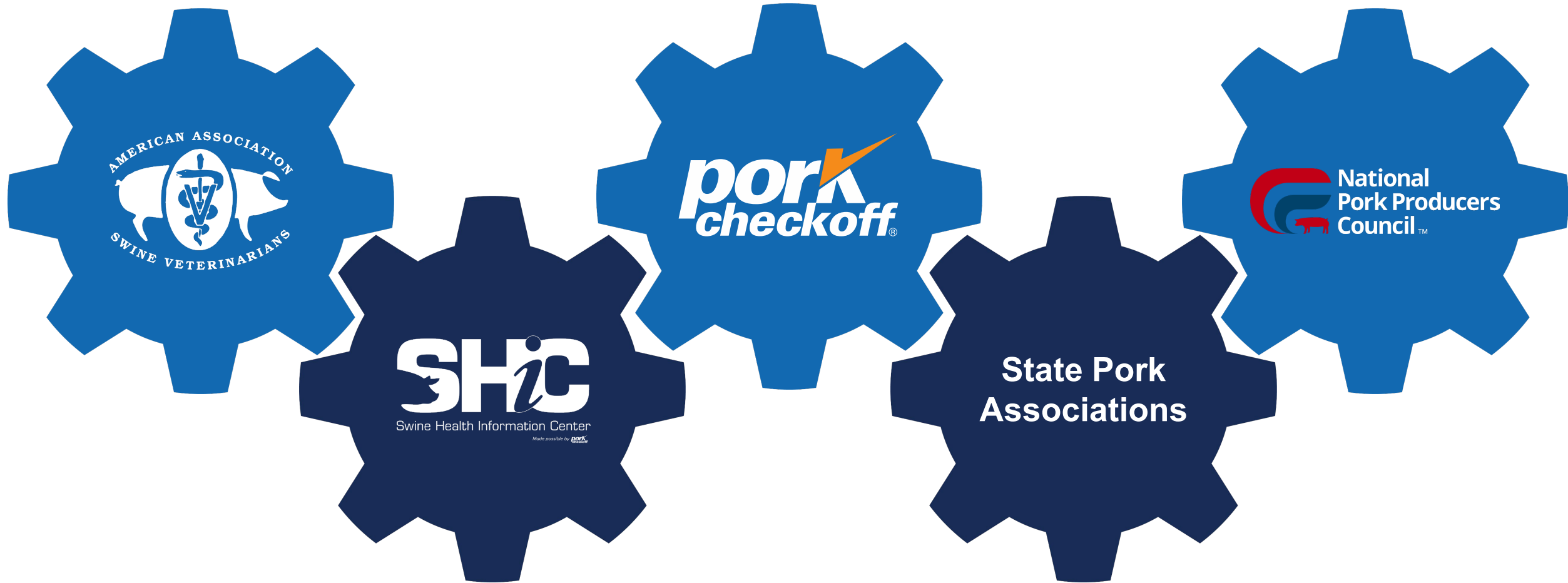


Community



Public Health

Coordination and Collaboration in the Swine Industry





A History of Influenza in Swine

- IAV can cause mild to moderate clinical disease
- Most common strains are H1N1 and H3N2
- Diagnosed by PCR via nasal swabs, udder wipes, oral fluids
- Short immunity but **boosted via vaccine**
 - Commercial or autogenous products available
 - Long history of IAV management

A History of Influenza in Swine

- 2009 H1N1 pandemic lessons learned
 - Words matter...swine flu vs H1N1
 - CDC and Public Health engagement is paramount to success
 - Food safety considerations
 - Human to pig transmission is more likely than pig to human
 - Sick employees need another option for work
 - Flu vaccine for employees
 - Temperature monitoring prior to entry
- Gained experience in managing pandemic influenza in hogs
 - Public health and consumer perception



Barnyard Collaboration

- Regular communication within and outside of the industry to ensure we have the most accurate and up-to-date information
 - Weekly flu update meetings with SMEs and Comms staff from NPB, NPPC, AASV, SHIC and others
 - Regular calls/meetings with colleagues across the barnyard
 - Communicating findings to key stakeholders
 - Responding to producer and veterinarian concerns
 - Outreach to state pork associations and their communicators
- Positioned to assist barnyard colleagues and respond if the case of an introduction
- Lessons learned for disease management for swine



Swine Industry Considerations

- Research has shown that pigs are susceptible to H5N1
- Risk is considered to be low for commercial swine raised indoors
- Producers should maintain high levels of biosecurity with measures aimed at preventing interaction between birds, livestock, cats, wildlife and pigs
 - Secure Pork Supply Plans serve as a resource for biosecurity
- Raw milk or milk products and raw eggs should not be consumed or fed

Utility of Industry Programs in Disease Response and Preparedness

- **Secure Pork Supply** is a great tool and resource for producers looking for biosecurity support
- NPB is reviewing the **Certified Swine Sample Collector (CSSC)** program for use case in the event of swine incursion
- **AgView** can be leveraged in multiple ways to manage H5N1
- **Pork Quality Assurance® Plus (PQA Plus®)** outlines good production practices with direct references to influenza, public health, and worker safety



Remaining Questions

How will this virus clinically manifest in pigs?

Are certain life stages are at increased risk?

If an introduction were to occur, when do you *stop* testing animals? Workers?

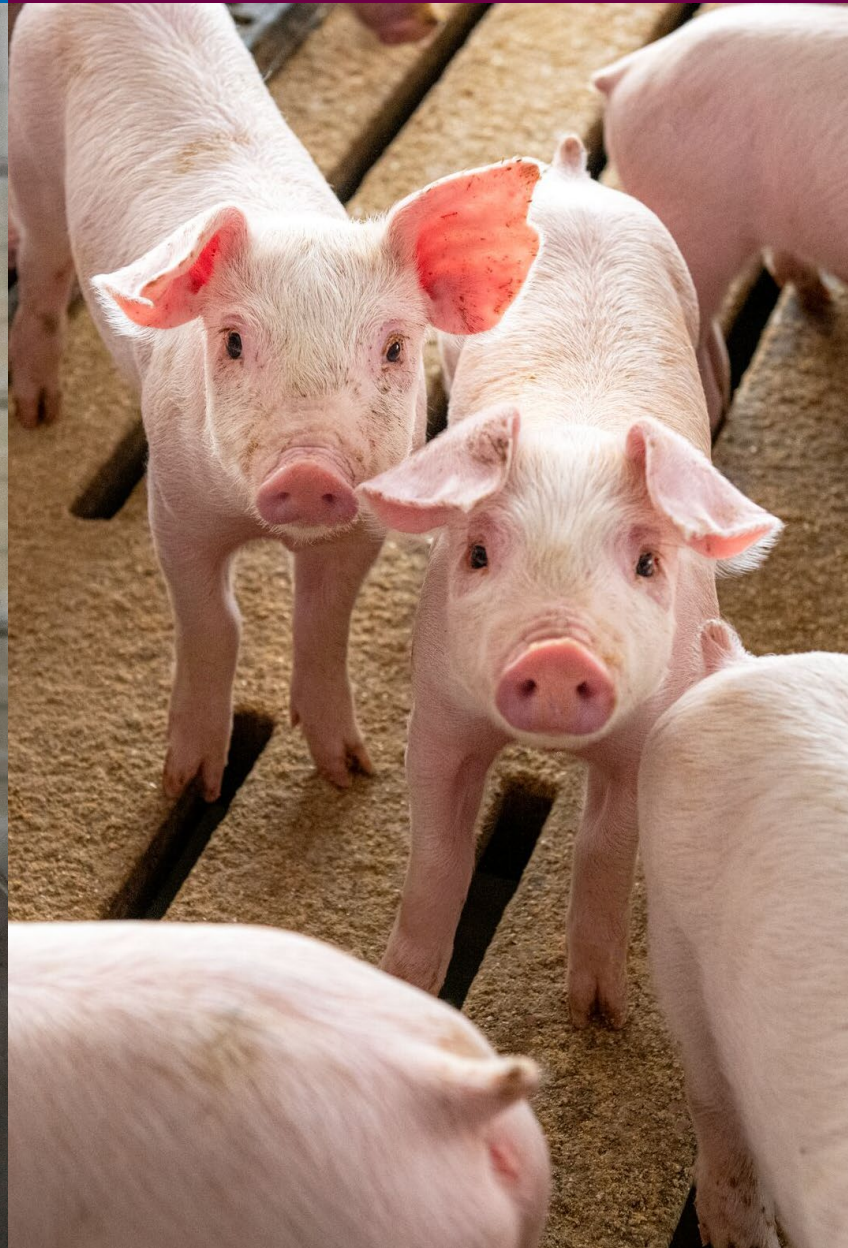
What role will manure play in disease transmission?



Aware



Invested



Ready to Respond



Thank you!



Consumer Focused. Producer Led.

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