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## **Scenario Analysis for Restricted Trade Access to Taiwan**

**Adam Gerval, Jim Hansen, Gayle Pounds-Barnett**

*Selected presentation for the International Agricultural Trade Research Consortium's (IATRC's) 2023 Virtual Summer Symposium: Fields of Discord: Understanding the Intersection of Geopolitics and Agriculture, June 26, 2023.*

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United States Department of Agriculture

# Scenario Analysis for Restricted Trade Access to Taiwan

Presented to the  
International Agricultural Trade Research  
Consortium – Summer Symposium  
June 26, 2023

Adam Gerval, Jim Hansen, Gayle Pounds-Barnett

**Disclaimer:** The findings and conclusions in this presentation are those of the authors and should not be construed to represent any official USDA or U.S. Government determination or policy. This presentation was supported by the U.S. Department of Agriculture, Economic Research Service (USDA/ERS)



# Objective

## Focus

Taiwan is almost entirely dependent on imports for numerous commodities including corn, soybeans, wheat, and beef. Domestic pork and poultry production is largely dependent on corn and soybean imports for livestock feed, which would begin to collapse without access to imports. This research will provide information and strong evidence to show how vulnerable the people of Taiwan are to restrictions on agricultural imports and the impact on global markets

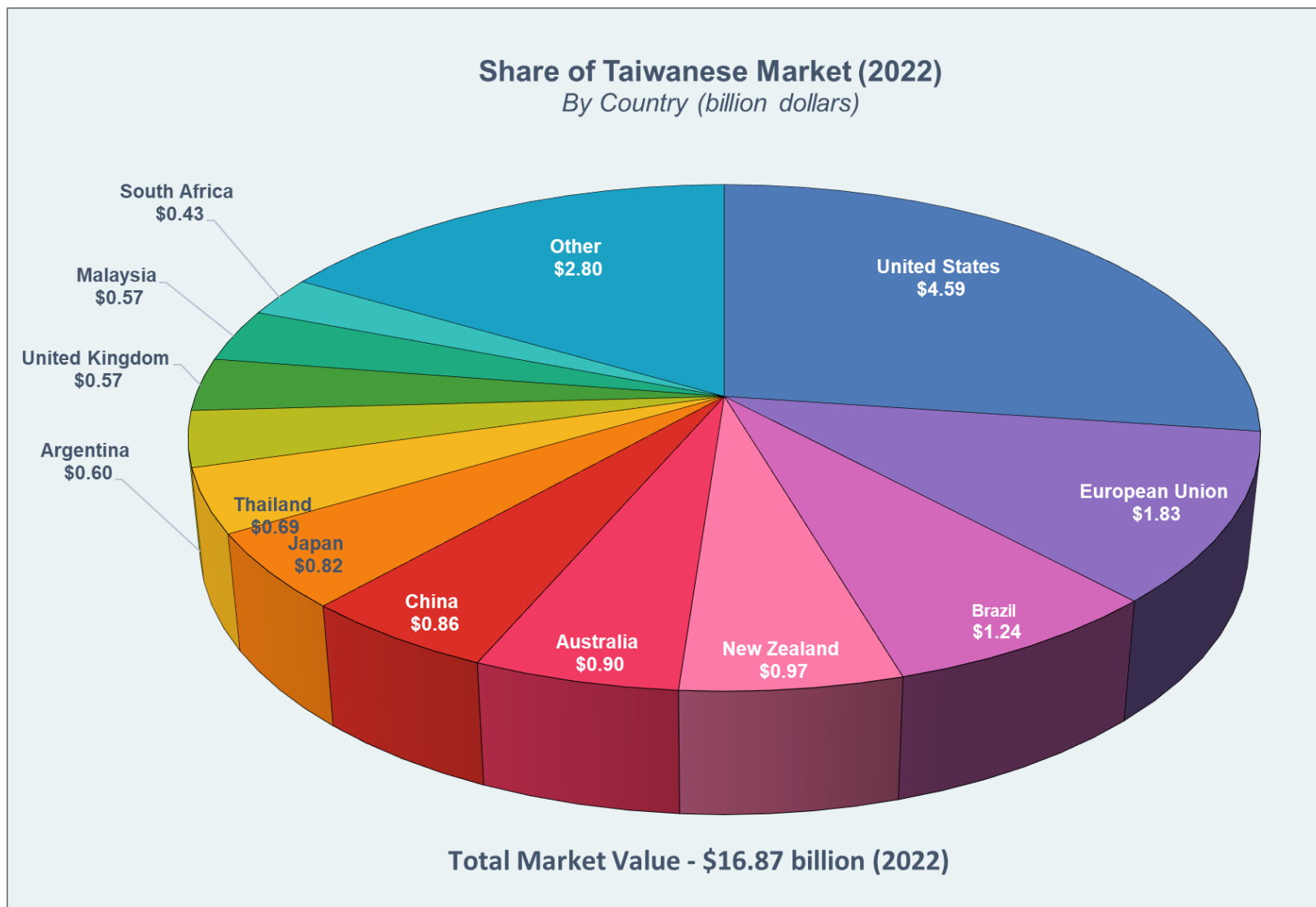
## Outline

- **Taiwan in Context: What does Taiwan's trade makeup look like?**
  - Top exporters and market share distribution
  - Share of U.S. agricultural exports by region
  - Export data and commodity breakdown
- **Conditions for import-dependency: Why is Taiwan so import-dependent?**
  - Trends throughout East Asia
- **Scenario & Results: How will lower imports impact Taiwanese agricultural variables and global markets?**
  - Projections for reduction in trade due to embargo shock
- **Conclusion & Key Findings**



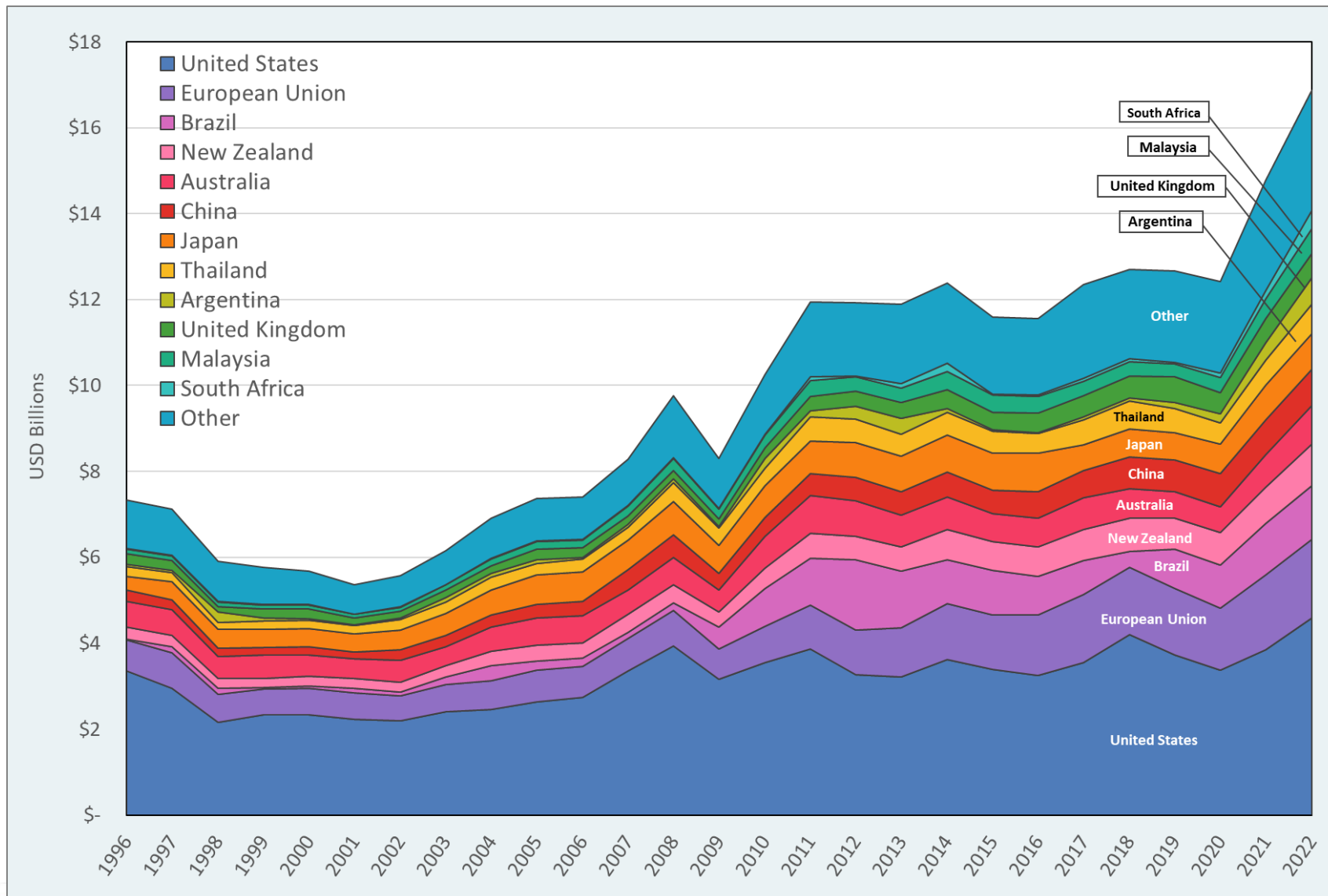
# Taiwan in Context

## Share of Taiwanese Market by country (2022)



# Taiwan in Context

*Share of Taiwanese Market by country (1996-2022)*

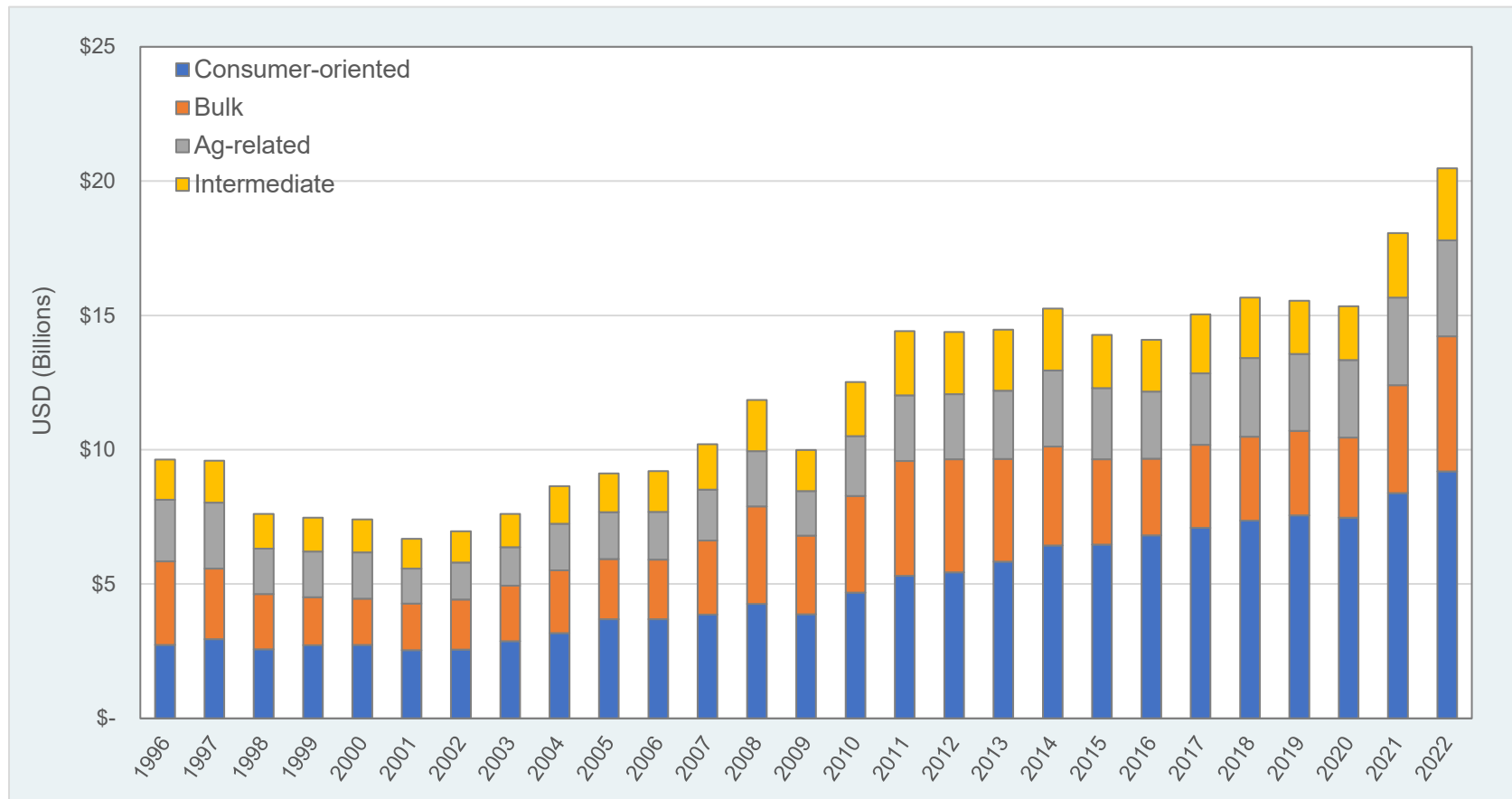


Source: Trade Data Monitor (TDM) June 2023



# Taiwan in Context

## *Commodity Breakdown of Imports from the World*



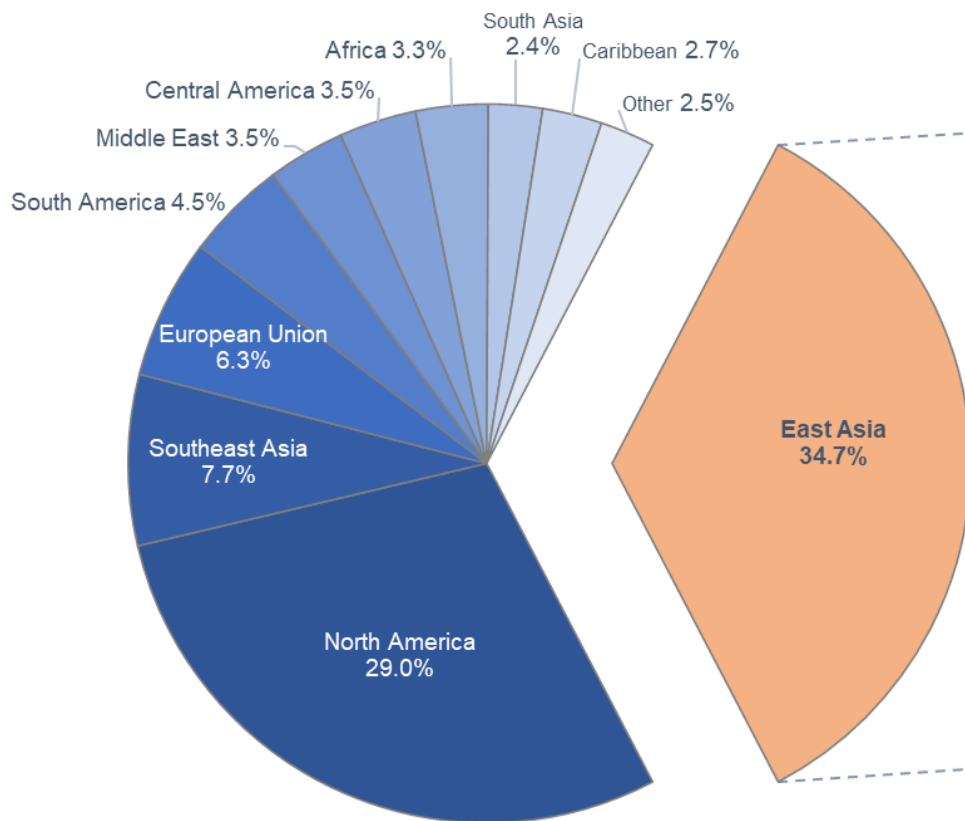
- Robust consumer markets open to diet diversity, favoring high-value consumer products
- Bulk commodities largely used for animal feed (soybeans and corn), and wheat for bakery products



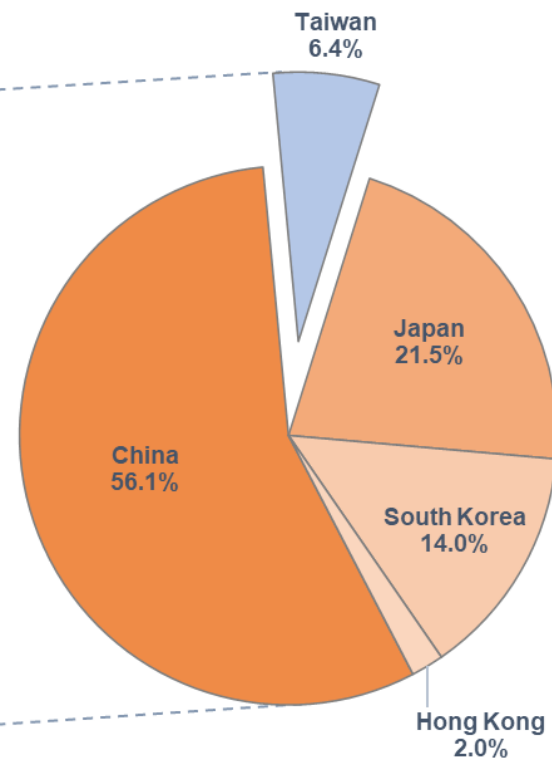
# Taiwan in Context

## Share of US Agricultural Exports by Region (2022)

**Value Share of U.S. Agricultural Exports (to world)**  
\$196.0B (2022)



**Value Share of U.S. Agricultural Exports to East Asia (by country)**  
\$68.0B (2022)



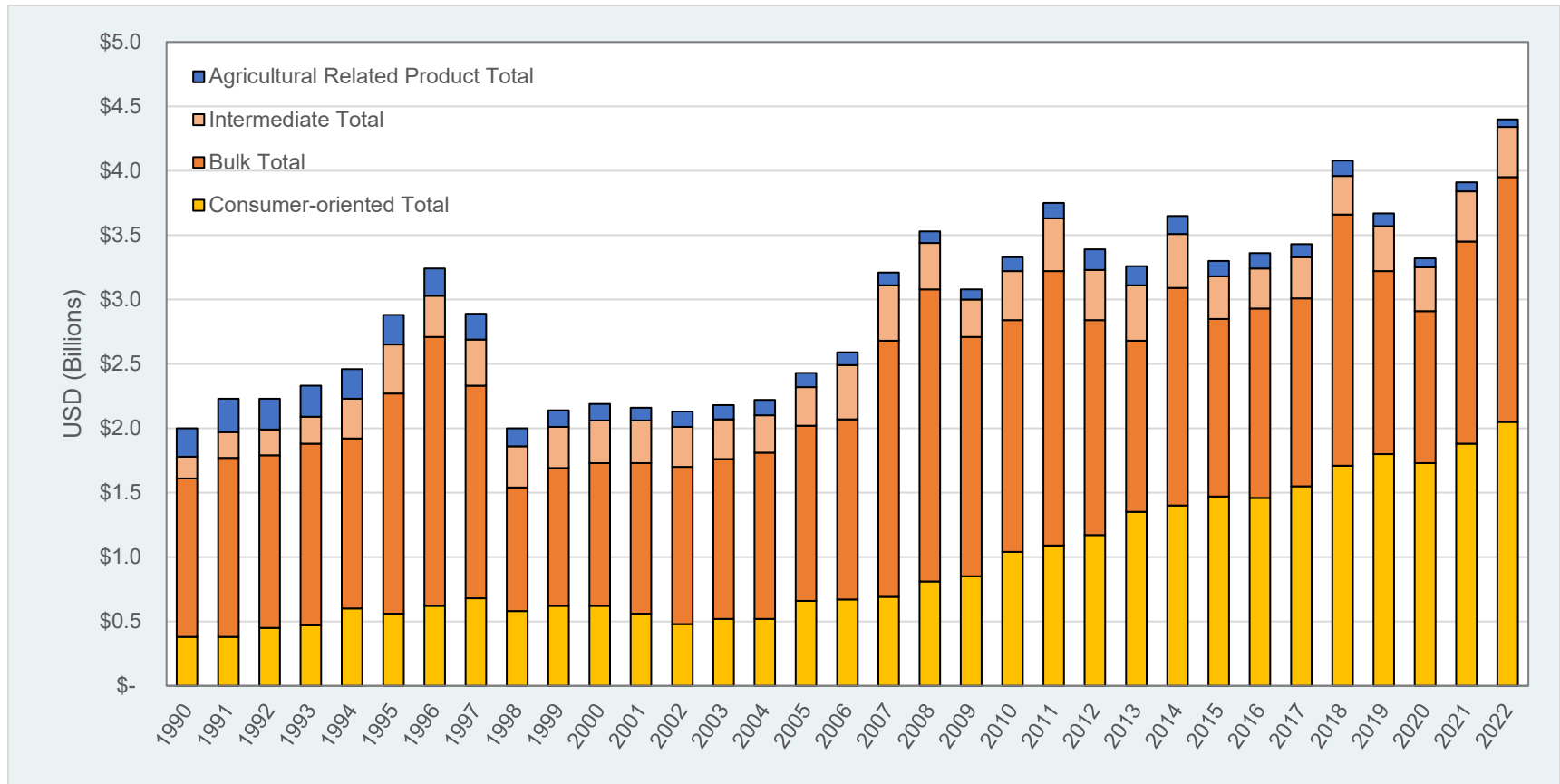
Source: Global Agricultural Trade System (GATS) December 2020





# Taiwan in Context

## *U.S. Export Data & Commodity Breakdown*



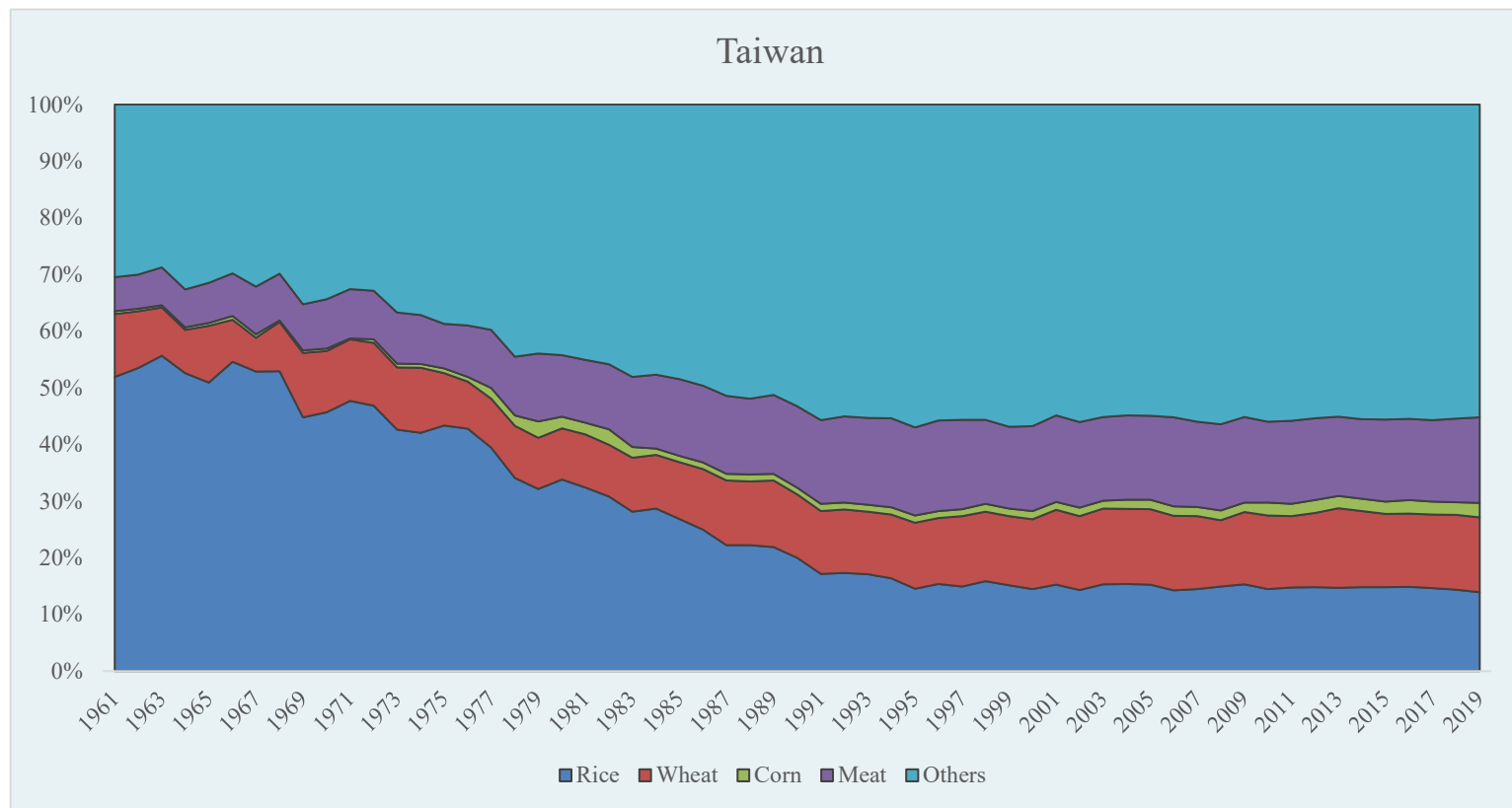
- Large importer of multiple U.S. agricultural products
- 5<sup>th</sup> largest importer U.S. poultry, fresh fruit; 6<sup>th</sup> largest importer of U.S. beef

Source: USDA, FAS, Global Agricultural Trade System (GATS) June 2023



# Westernization of Dietary Habits

## *Portion of Daily Caloric Intake*



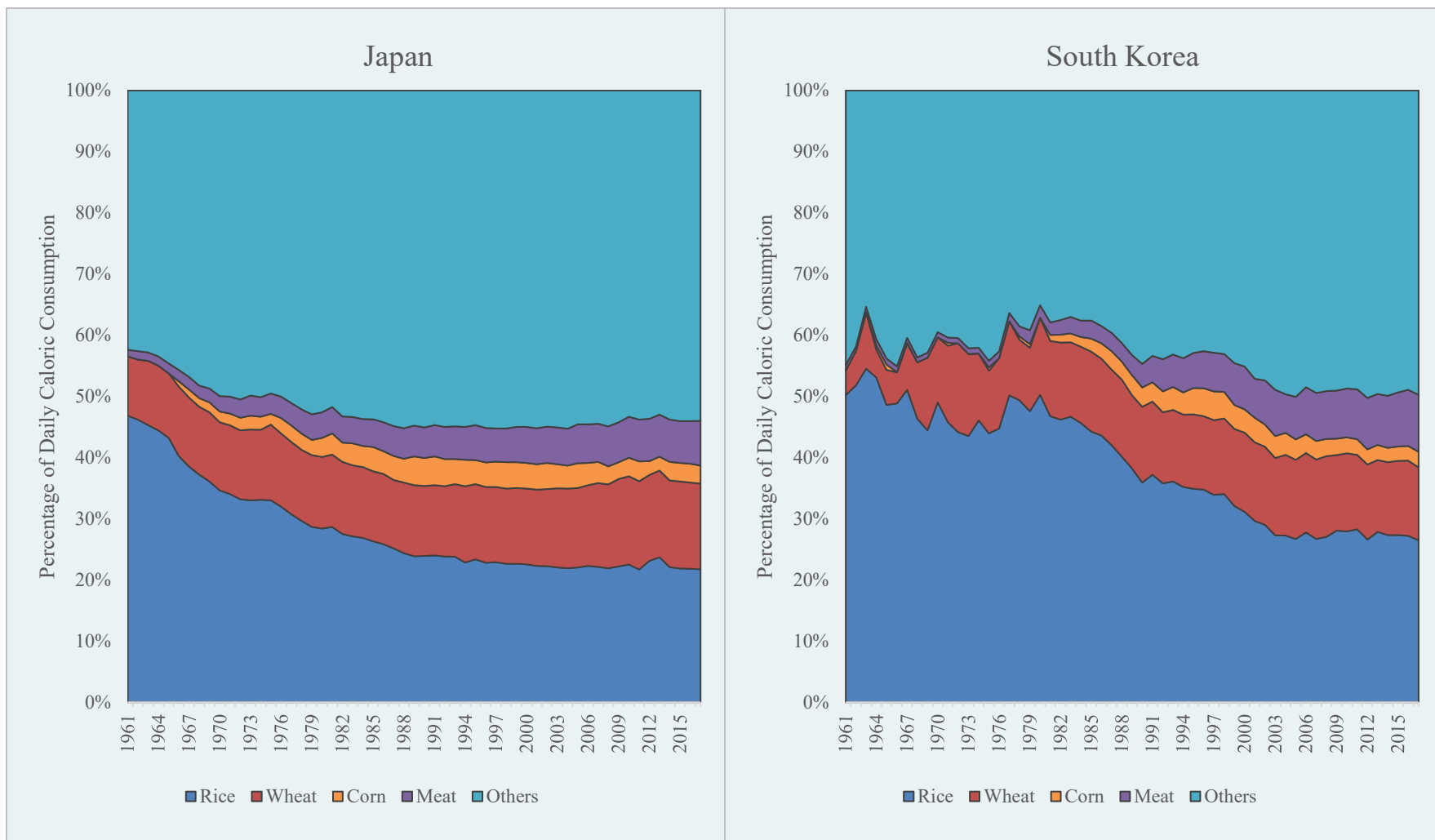
- Consumption patterns favor western-style habits (i.e., beef, pork, corn, wheat, etc.)
- Most of domestic agriculture limited to rice farming; creates need for imports

Source: Food and Agricultural Organization (FAO), June 2023



# Westernization of Dietary Habits

## *Portion of Daily Caloric Intake*



Source: Food and Agricultural Organization (FAO), June 2023



# Key Takeaways & Context for Scenario

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- Taiwan is a wealthy country with large population and agricultural sector incapable of meeting broad domestic demand
- Highly dependent on imports for domestic food supply; domestic agricultural self-sufficiency 30 percent
- Evolving consumer preferences similar to other East Asian countries (aging population, dietary evolution, highly urbanized)
- Robust consumer markets open to diet diversity, favoring high-value consumer products
  - Large importer of beef, dairy, fresh fruit; bulk commodities like soybeans and corn for livestock feed



# Impact from a decrease in Taiwan's imports for beef, wheat, corn and soybean on global markets

Model description, market shares, scenarios  
and results for decreasing Taiwan's imports



# USDA's Baseline Model & Agricultural Projections

- Modeling system: dynamic partial equilibrium simulation non-spatial trade country models
  - 43 countries/regions, 24 commodity markets
  - Equilibrates: (Supply = Demand) & (Imports = Exports)  
Solves for prices and trade, clear world and country markets
- Baseline Development: Analysts Judgment: Model + Delphi approach
  - Country modelers, Commodity analysts (ERS, WOAB, FAS, NASS, ...)
  - Country specialist, Weather and geographic specialists
- 10-year projection of major commodities
  - Supply, demand, feed, food, trade, stocks, and prices, etc.
  - Based on October 2022 market conditions and data. Released February 2023
- Assumptions:
  - Continuation of current U.S. law and international trade agreements
  - Population growth slows, strongest in developing countries
  - Macroeconomic growth – strongest in emerging markets
- Process: Macro, modelers, analyst meetings, trade-commodity spec, calibrate



# One scenario is conducted on Taiwan's imports of beef, wheat, corn, and soybeans.

The scenario is an 80% decrease in Taiwan's imports for beef, wheat, corn and soybeans.

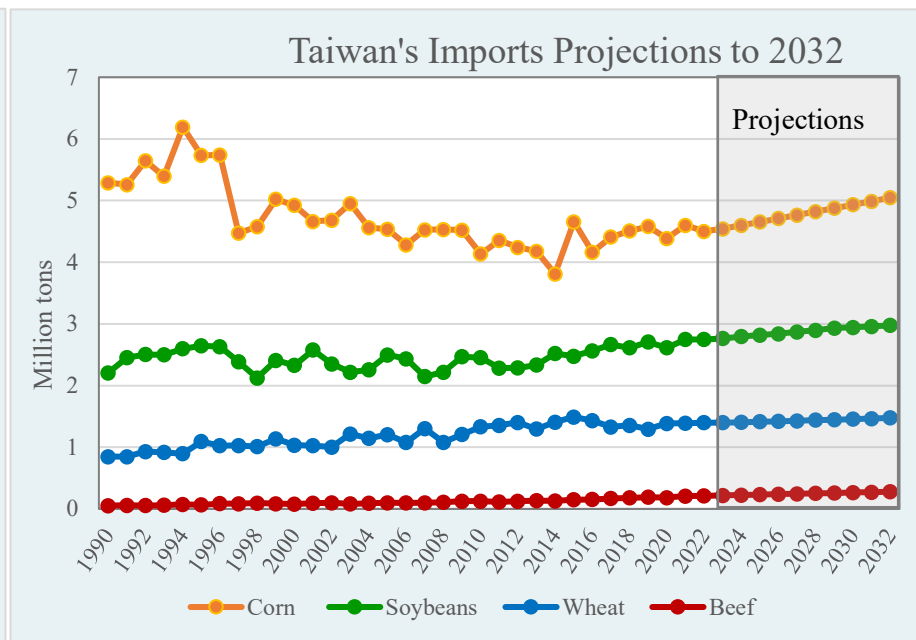
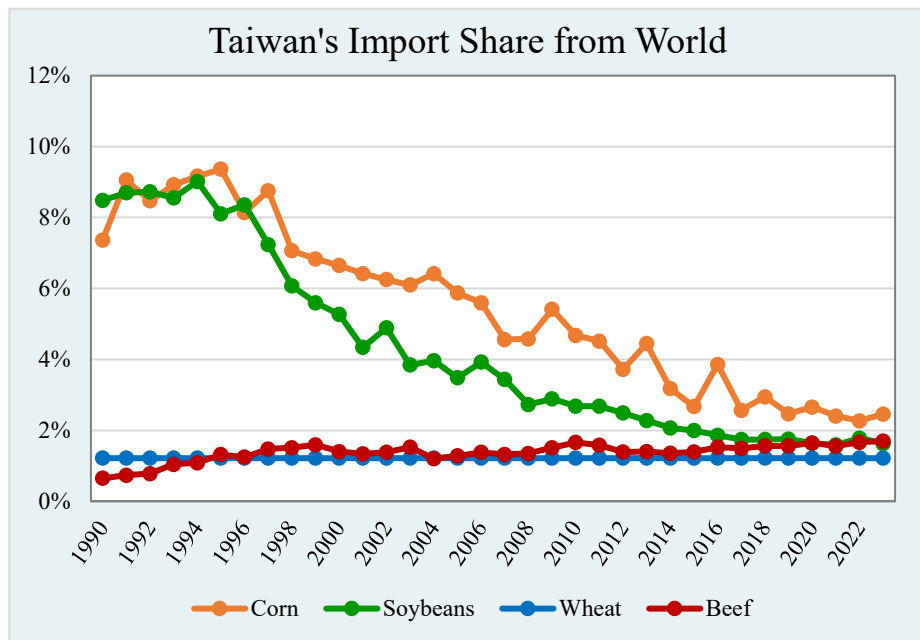
- The scenario is exogenously imposed to restrict imports of these commodities in the year 2024 and then held constant.
- All commodities are critical for Taiwan to import with little to almost no domestic production for beef, wheat, corn, and soybeans.
- The commodities were selected based on the high degree of import dependence and the large impact on other domestically produced commodities.





# Commodities of Focus

*Beef, wheat, corn, and soybeans*



- Taiwan projected to maintain import growth through 2032, absent shock
- Population growth rates, GDP per capita growth, and urbanization all exhibit stable growth; no major factors expected to change consumption patterns

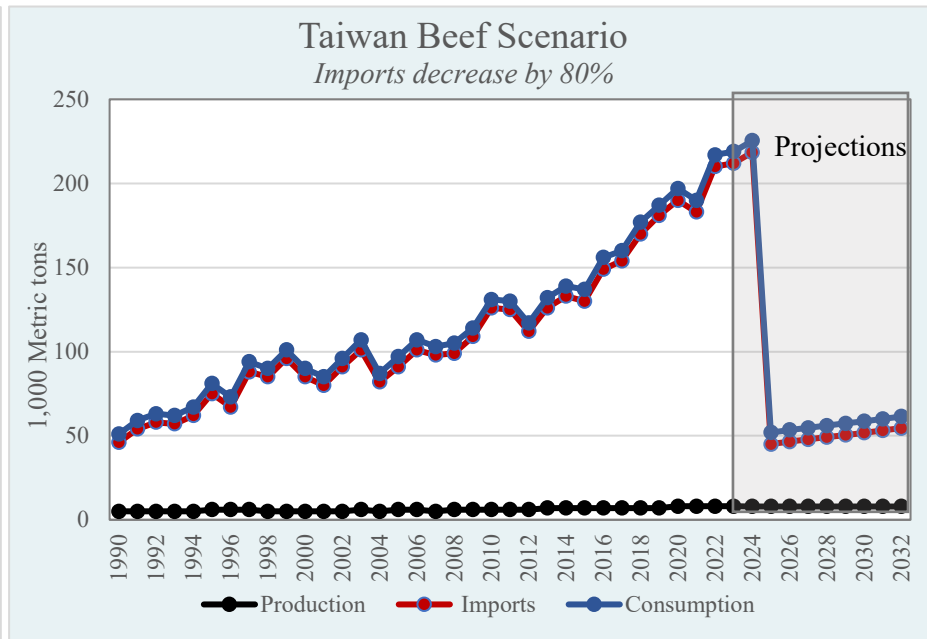
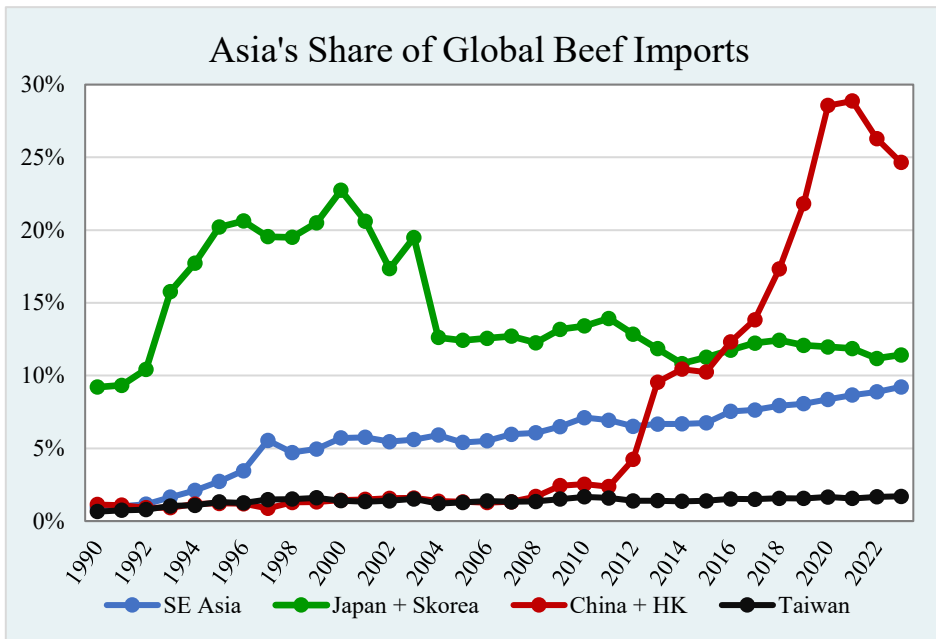
## Taiwan global import shares are small

| Beef | Wheat | Corn | Soybeans |
|------|-------|------|----------|
| 1.7% | 1.2%  | 2.5% | 1.6%     |





# Regional Beef Import Share & Scenario Results



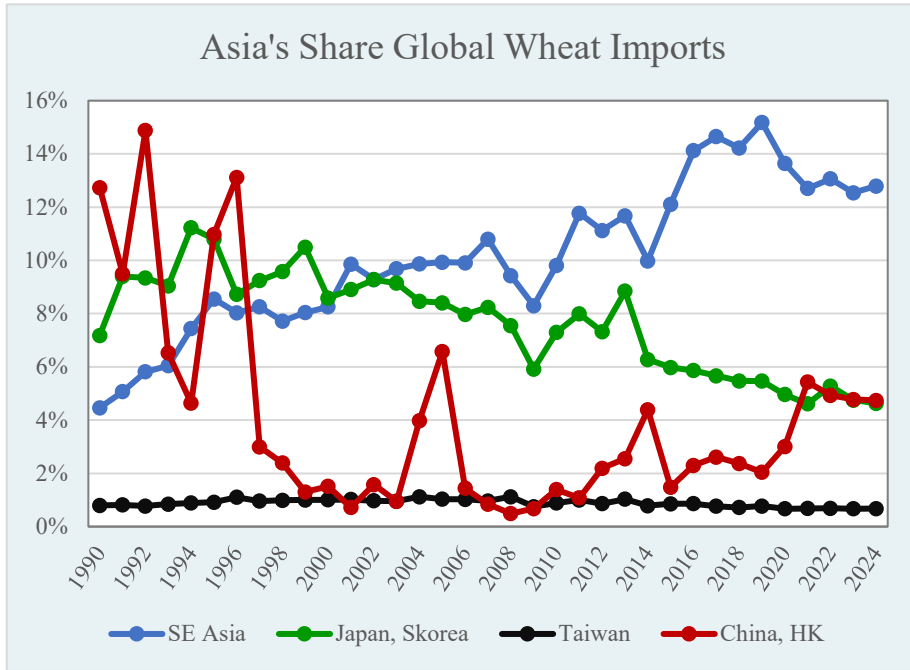
USDA Long-term Projections, February 2023

USDA Long-term Projections, February 2023

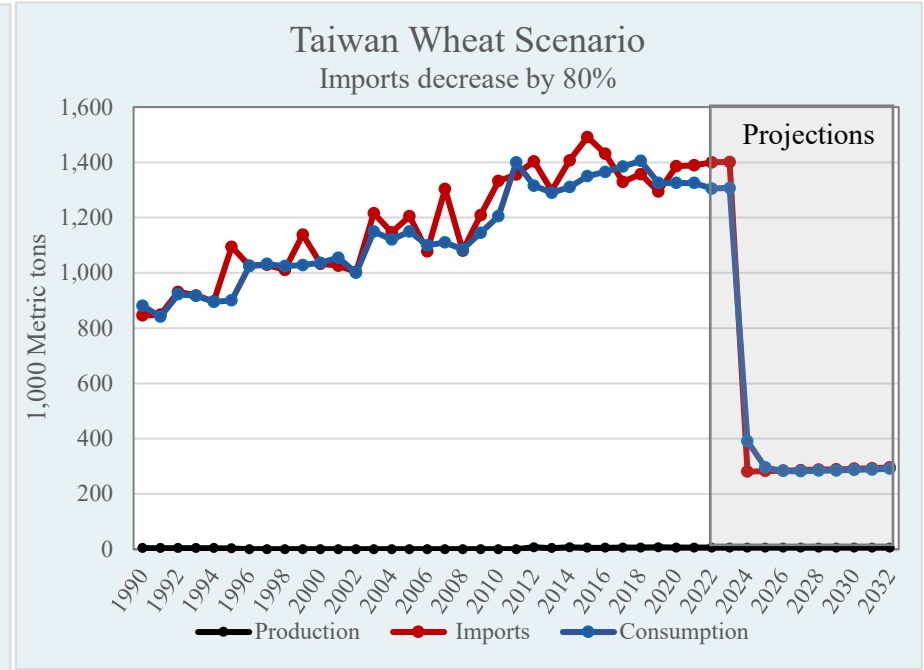
- Scenario implements 80 percent decrease in beef imports (174,000 tons)
- Taiwan’s global import share is small but is almost 97 percent of consumption



# Regional Wheat Import Share & Scenario Results



USDA Long-term Projections, February 2023

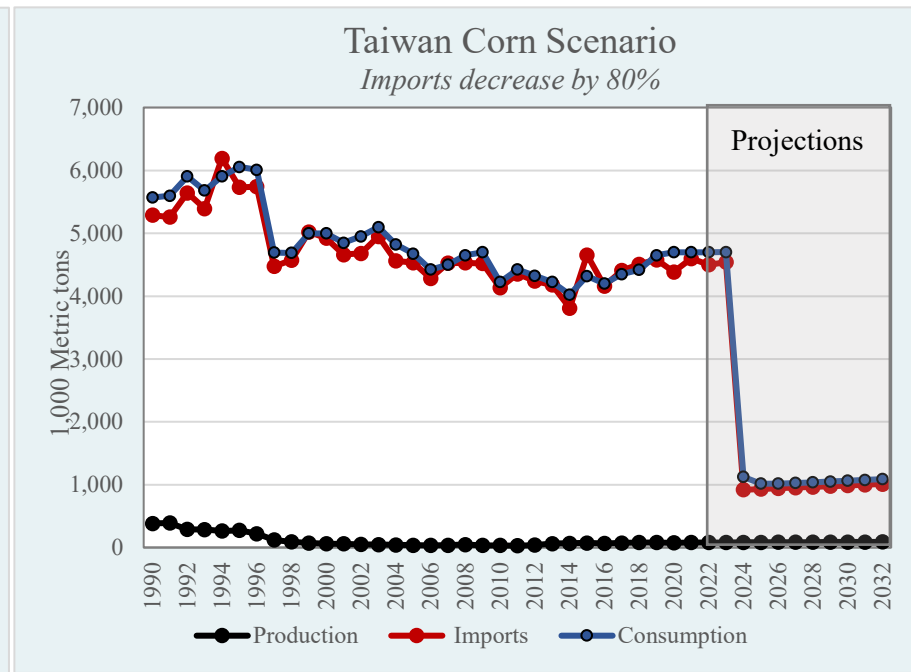
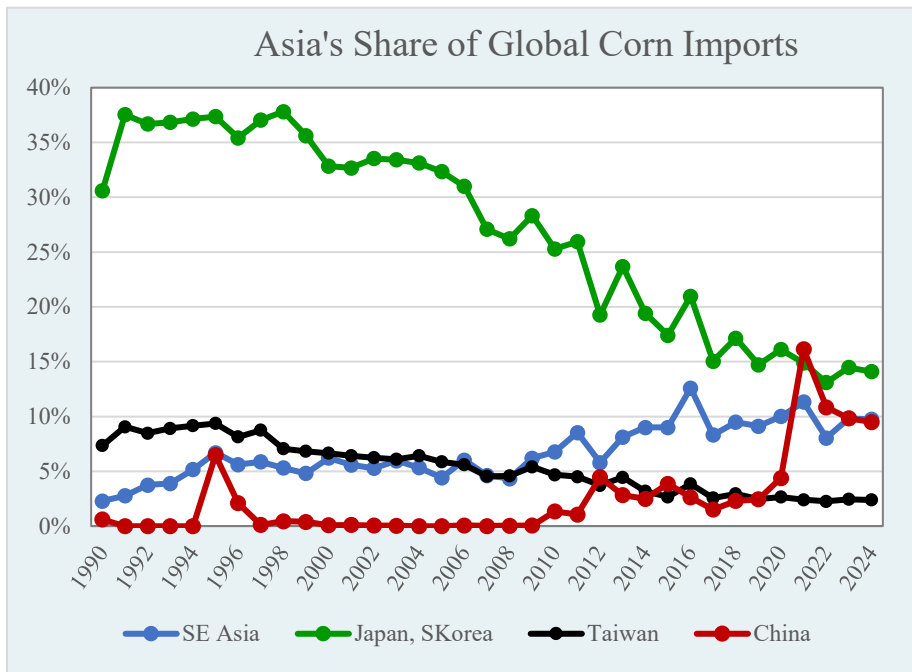


USDA Long-term Projections, February 2023

- Scenario implements 80 percent decrease in wheat imports (1.12 million tons)
- Taiwan’s global wheat import share is small but is almost 100 percent of consumption



# Regional Corn Import Share & Scenario Results



USDA Long-term Projections, February 2023

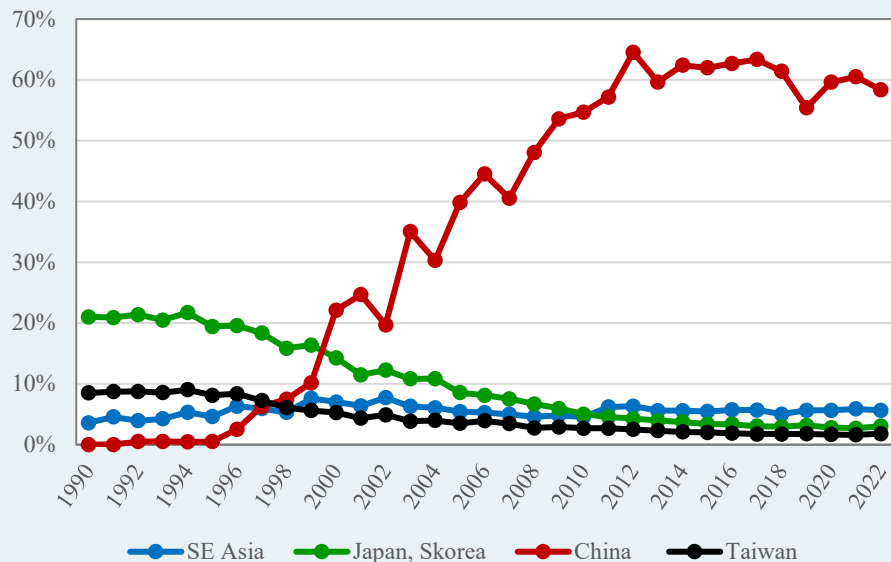
USDA Long-term Projections, February 2023

- Scenario implements 80 percent decrease in corn imports (3.6 million tons)
- Taiwan's global corn import share is small but is almost 96 percent of consumption

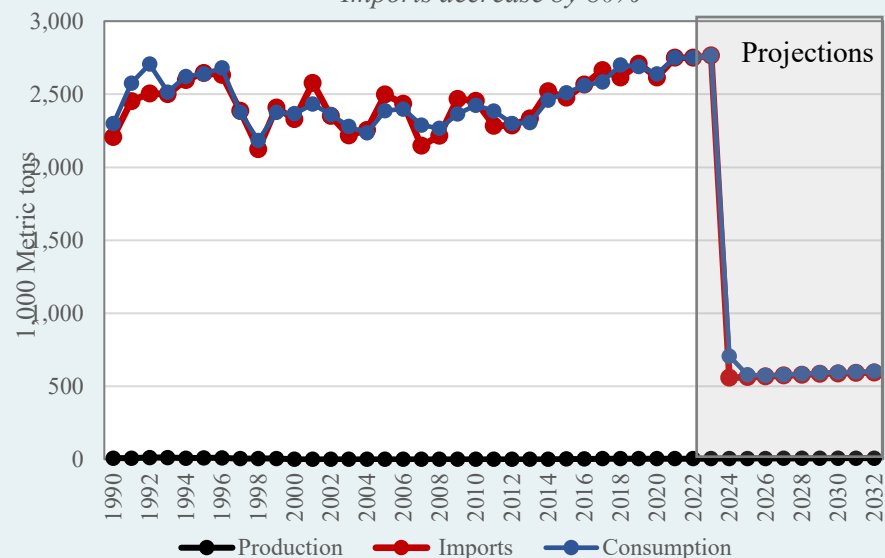


# Regional Soybean Import Share & Scenario Results

## Asia's Share of Global Soybean Imports



## Taiwan Soybean Scenario *Imports decrease by 80%*

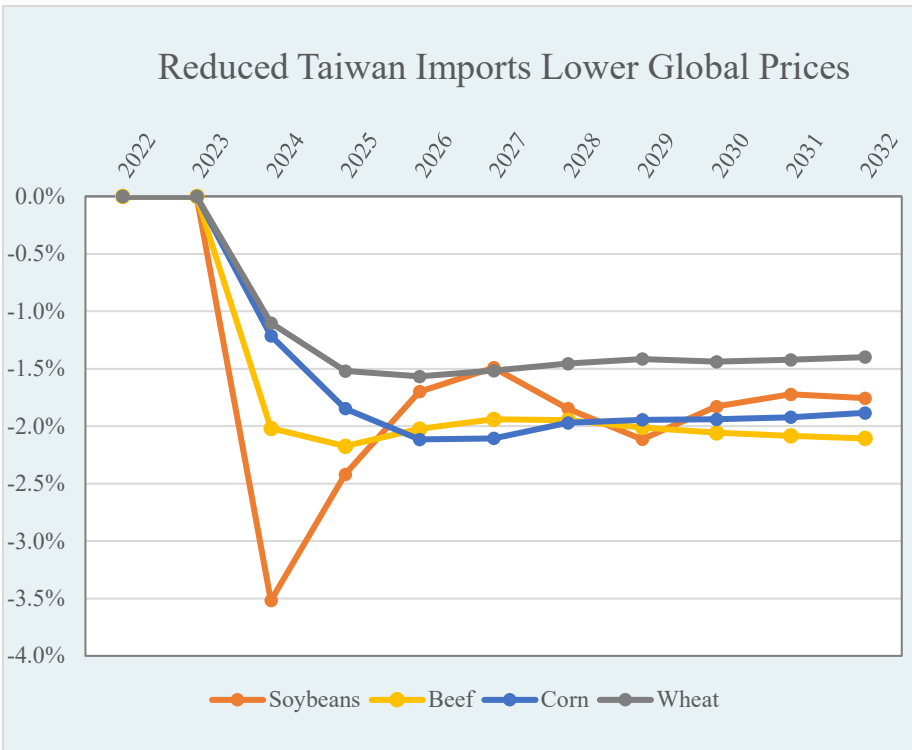
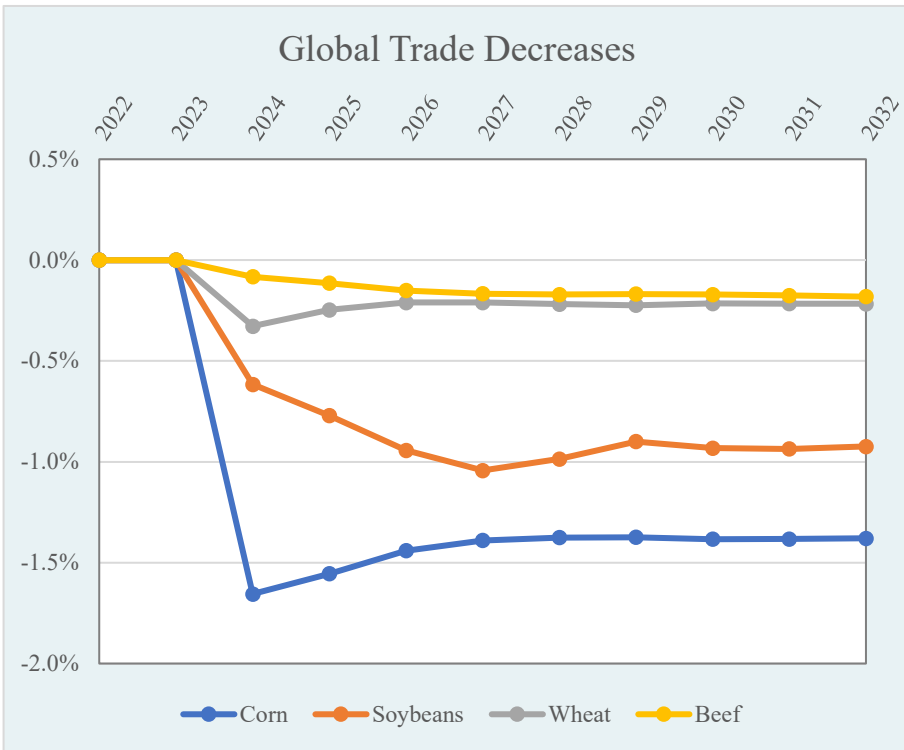


USDA Long-term Projections, February 2023

USDA Long-term Projections, February 2023

- Scenario implements 80 percent decrease in soybean imports (2.1 million tons)
- Taiwan's global soybean import share is small but is almost 100 percent of consumption





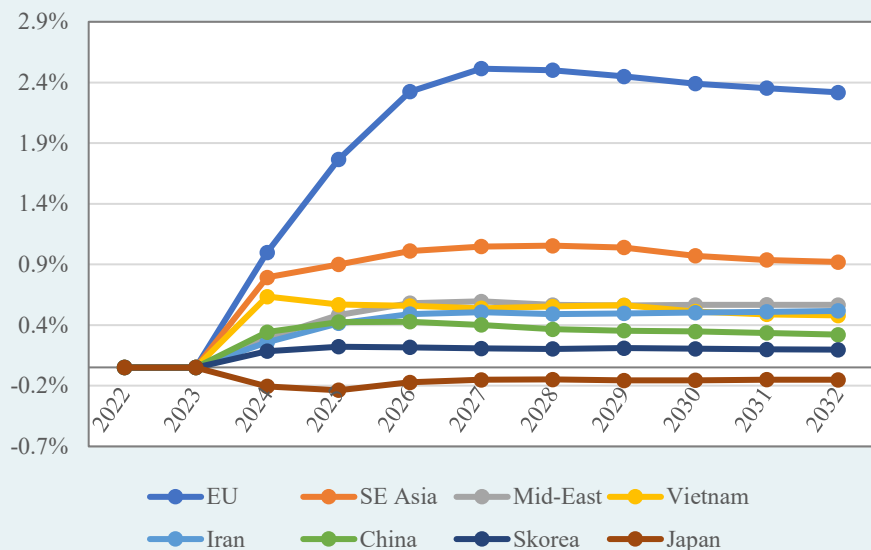
- Trade: Corn exhibits the largest decrease at -1.6 %; soybeans at -1%
- Price: Soybeans exhibit the largest decline at -3.5 %; beef at -2%, then corn and wheat.
- Despite its small share of global imports, the effect still impacts global markets due to large decrease in imports

*Source: Projections and scenario based on USDA baseline model and long-term projections, February 2023*

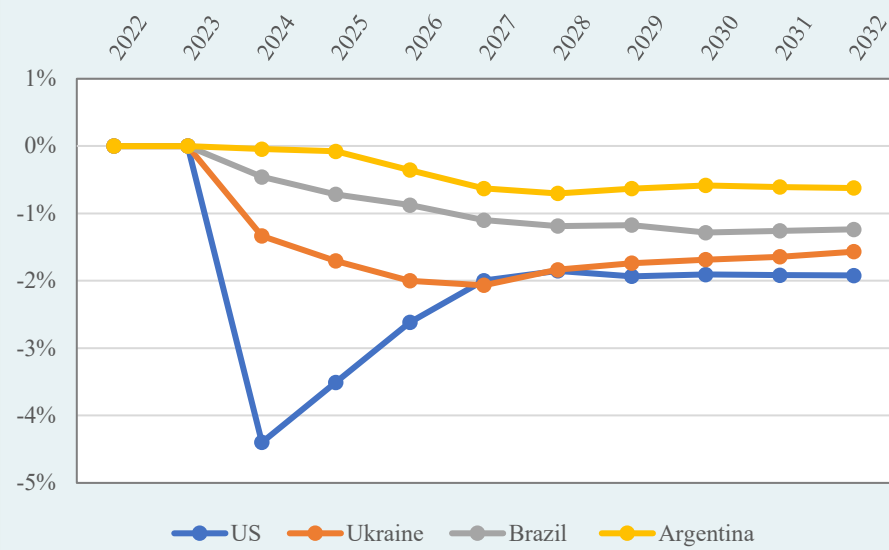
*Disclaimer: Results are preliminary and have not been peer reviewed*



### Corn Imports Increase



### Corn Exports Decrease



- EU exhibited largest increase in corn imports at 2.5 % followed by Southeast Asia, Middle East, and Vietnam
- Corn exports decrease by all major exporters, lower prices lead to higher domestic consumption and less exports
- Lower global corn prices and expanding meat consumption increase feed demand
- Ukraine exports did incorporate current war with Russia, but exports are lower

*Source: Projections and scenario based on USDA baseline model and long-term projections, February 2023*

*Disclaimer: Results are preliminary and have not been peer reviewed*





# Key Findings – Taiwan Reduces Imports

- Taiwan import share are low: Beef 1.7%, wheat 1.2%, corn 2.5%, and Soybeans 1.6%.
- Large reduction in Taiwanese imports has global effects, reducing global prices: soybeans -3.5%, beef -2%, corn -2% and wheat -1.5%.
- Neighboring countries (China, Japan, and South Korea) have larger global import market shares. Southeast Asia is a large, growing importer of bulk commodities
  - Combined, these countries and region global import market shares are substantial (beef 45%, corn 33%, wheat 22%, and soybeans 67%)
- Future research will focus on an expansion of trade disruption to neighboring countries (i.e., lower import demand). Impact on global prices potentially significant due to large global import market share
  - Future research will provide information for both agribusinesses and government officials focusing on potential global market disruptions
  - Additional focus on Taiwan domestic food demand and prices. Current research proved difficult for Taiwan model to solve equilibrium for domestic prices



Thank you for your time

Please let us know if you have any questions

