China's Meat Import Demand: The Impact of Supplier Diversification on U.S. Exports

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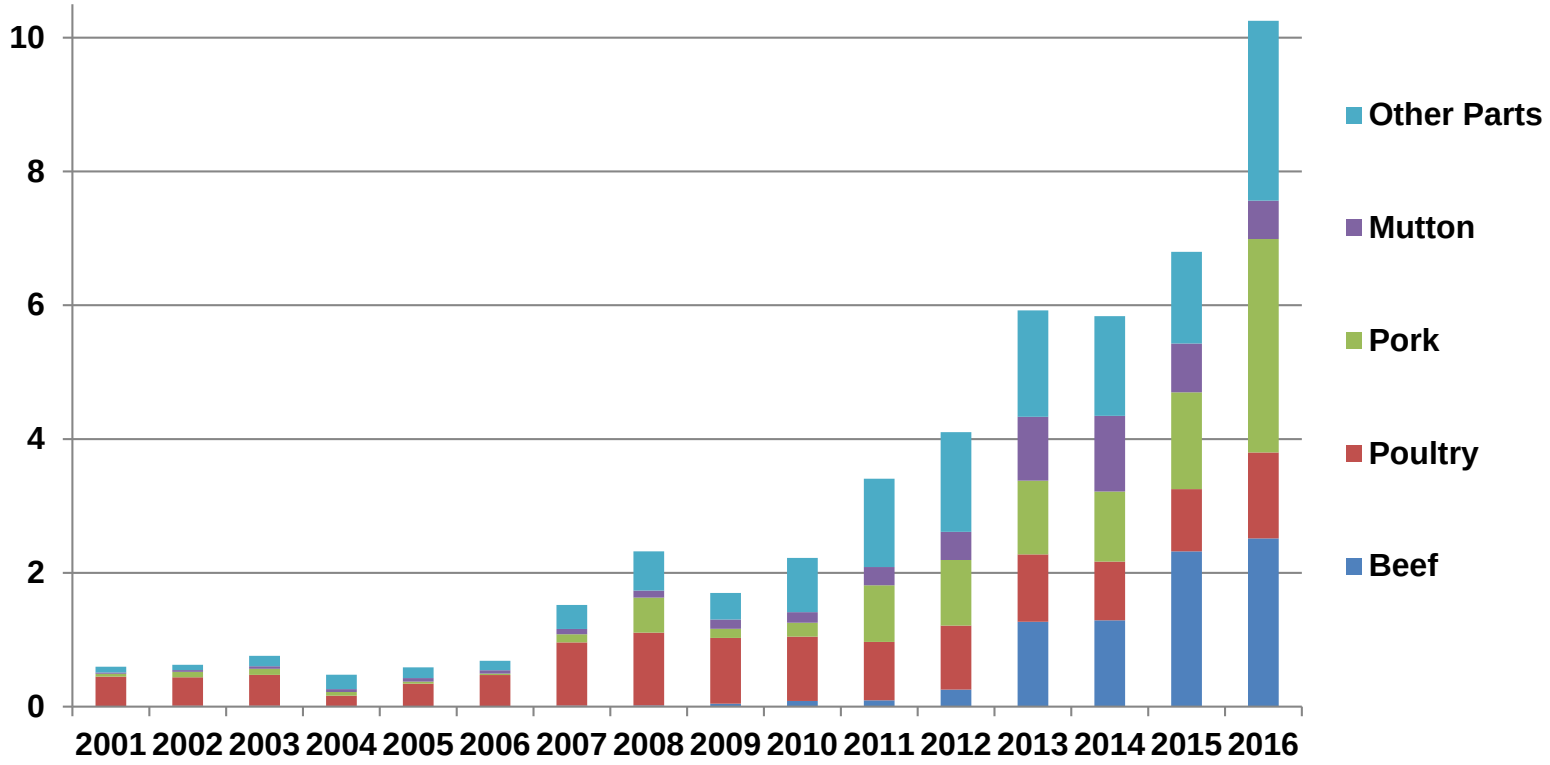
Outline

- Overview of China's Trade Diversification Strategy
- China's Meat Imports Trends
- Objectives
- Empirical Model
- Results
- Conclusions

Motivation

- China has emerged as a leading importer in the global meat market
  - Trade liberalization
    - Accession to the WTO in 2001
  - Rising living standards
  - Changing consumption patterns
  - Between 2001 and 2016, the total value of meat imports increased by over 1600%

China's Meat Imports between 2001-2016 ($ billion)



- In 2001, China ranked 16th with meat imports of only $ 0.6 billion
- In 2016, China's imports increased to $10.3 billion, ranked number one
- Annual import growth rate: beef (49.8%), pork (33.6%), and poultry (7.3%)

China's Trade Diversification Strategy

- To provide greater opportunities for Chinese meat importers
- To negotiate lower prices
- To reduce risks from supply disruptions

New Strategy

- The 2015 No.1 Document called for China to diversify sources of imports.
  - Expand free trade agreements
  - Ex. Australia, New Zealand, Chile
  - Increase in China's import protocol on meat products

Impact of the New Strategy

- Opens China's meat market to new countries and increases competition for exporting countries, including U.S. meat exporters

Research Objectives

- Explore the impact of China's trade diversification strategy on the global meat market
- Develop a Restricted Source Differentiated Almost Ideal Demand System (RSDAIDS)
- Develop projections for China's meat import demand based on the elasticities and China's expanding FTAs

Literature Review

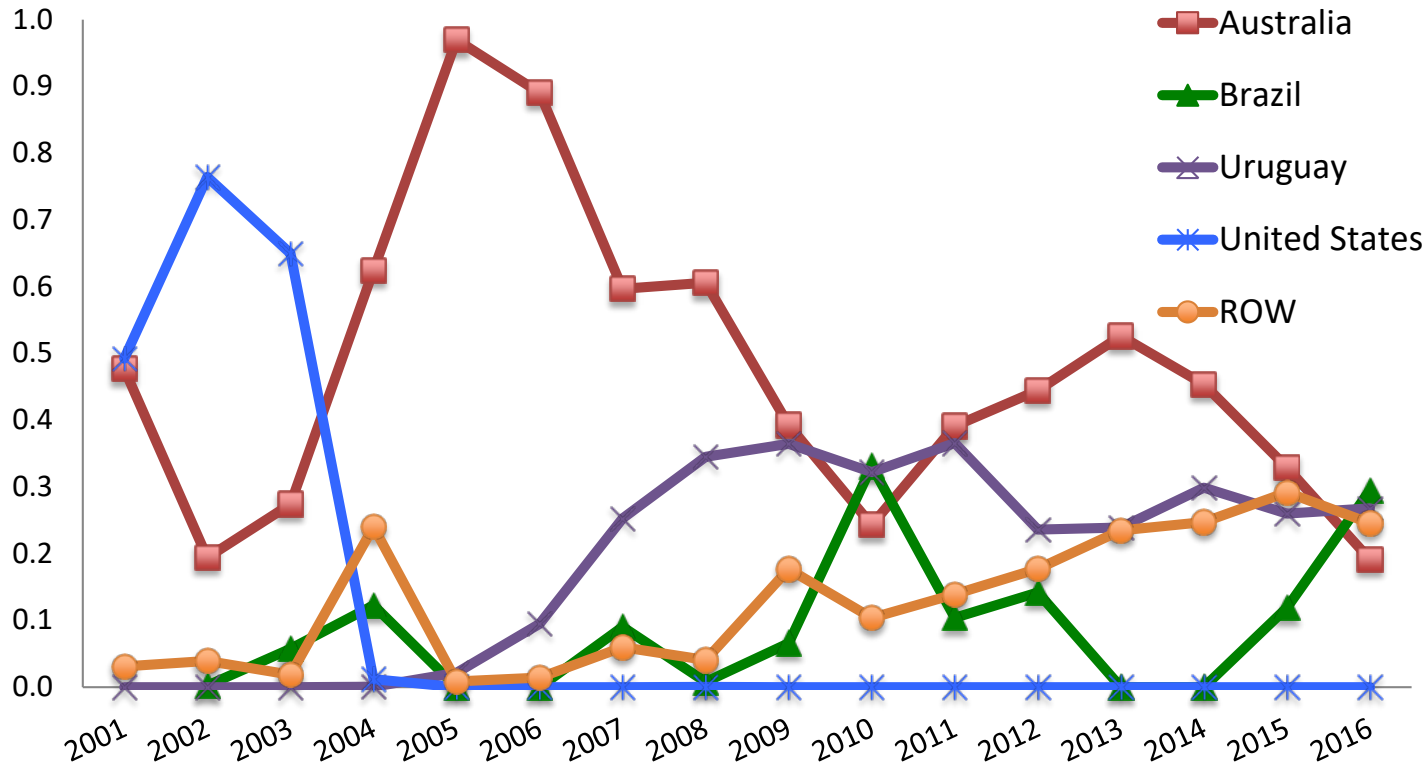
Meat import demand by source

- Yang and Koo, 1994—Japanese Meat Import Market
- Henneberry and Hwang, 2007—South Korean Meat Import Market
- Mutondo and Henneberry, 2007—Both Japan and South Korea
- Cheng, Hao, Geo, and Seale, 2015—China meat import demand

China

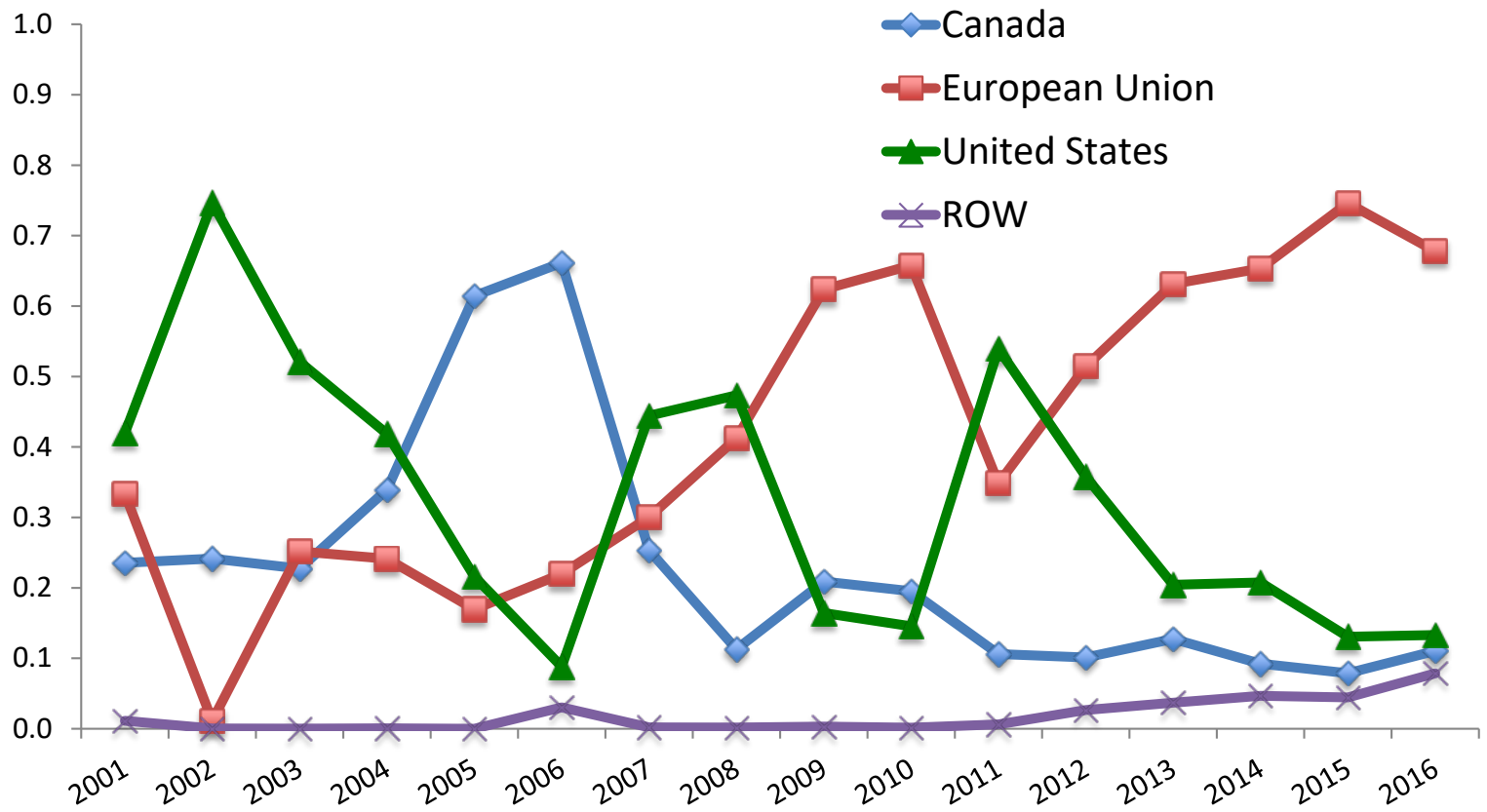
- Japan and South Korea are important to the U.S., but China is the future.
- Population: 1.4 billion
- GDP growth: 6.7% annual change in 2016

China's Beef Import Share by Quantity across Source Countries



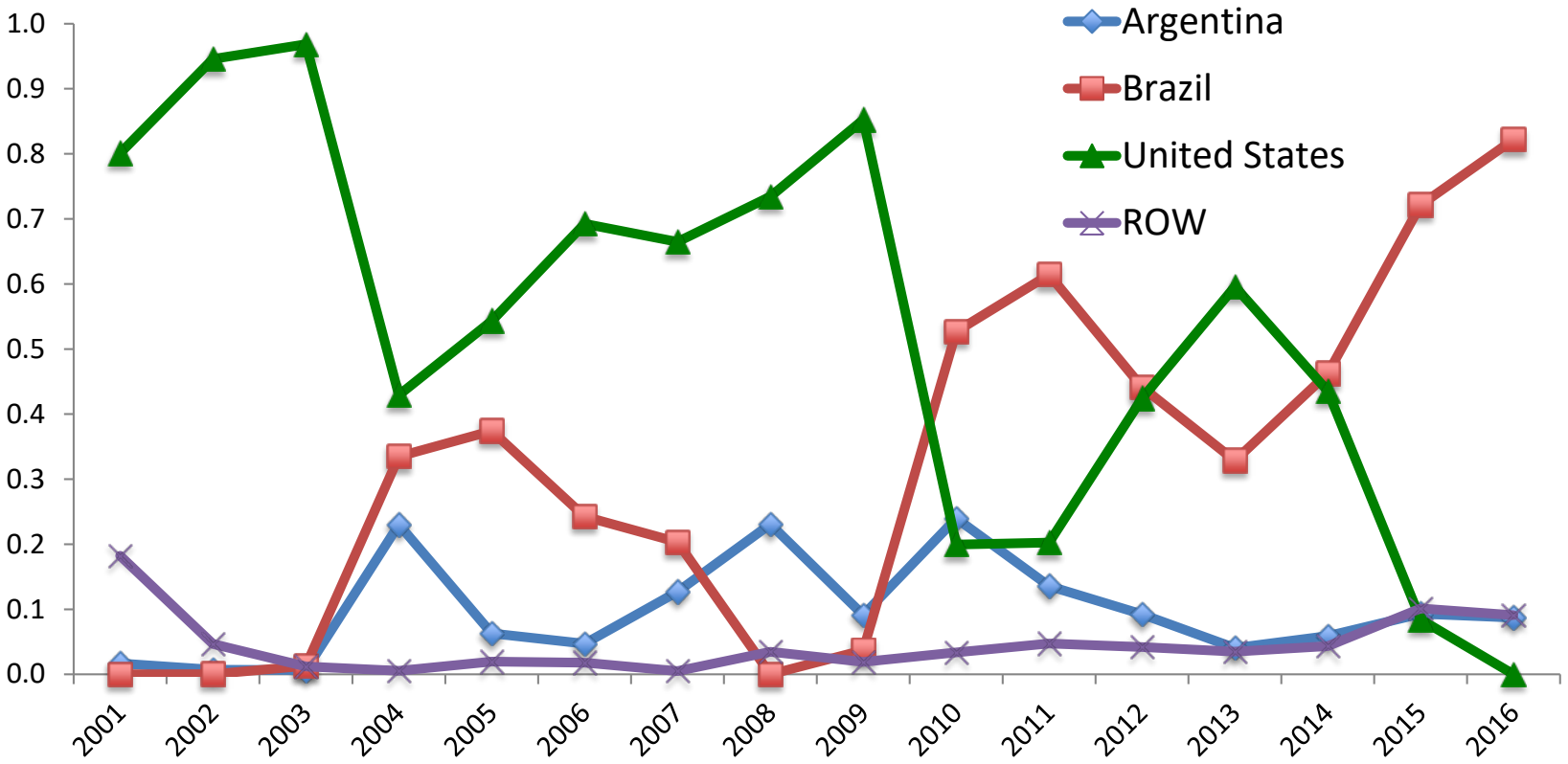
- In 2004 U.S. lost its market share (BSE outbreak) where China banned U.S. beef products, reopened U.S. market in May 2017
- In 2016, Australia (19%), Brazil (30%), and Uruguay (27%) captured the U.S. share

China's Pork Import Share by Quantity across Source Countries



- During 2001 to 2011, the EU, U.S. & Canada were the largest exporters to China (98% of the total China's import)
- China has a zero-tolerance for ractopamine in pork
- Since 2012 the EU dominated this market; average market share of 65%.
- Brazil entered China's market in recent years, 5%market share in 2016.

China's Poultry Import Share by Quantity across Source Countries



- The U.S., Brazil & Argentina accounted for the bulk of China's imports
- The U.S. has historically been the dominant supplier.
- Since 2010, Brazil surpassed the U.S. as the largest poultry exporter to China due to the U.S. Avian Influenza outbreak & trade restrictions.

Data

- Monthly data: January 2001 to August 2017
- Meat import data collected from the Global Trade Atlas at the 4-digit HS level
- Import values and quantities
  - Import price
  - Tariffs are collected from the WTO and FTAs
- Meat categories:
  - Beef, pork, poultry, mutton and other parts

Top meat suppliers to China

- Beef: Australia, Brazil, New Zealand, Uruguay, the U.S. & the ROW
- Pork: Canada, the EU, the U.S. & ROW
- Poultry: Argentina, Brazil, the U.S. & the ROW

Restricted Source Differentiated Almost Ideal Demand System (RSDAIDS)

- Apply a restricted source differentiated meat import demand (RSDAIDS) model

$$(1) \qquad w_{i_h} = \alpha_{i_h} + \sum_k \gamma_{i_h k} \ln(p_{i_k}) + \sum_{j \neq i} \gamma_{i_h j} \ln(p_j) + \beta_{i_h} \ln\left(\frac{E}{P^*}\right)$$

- *i*: meat; *h*: source country; *t*: month
- $w_{i_h t}$ = the budget share of good *I*
- $ln(p_j t) = \sum_k w_{jk} ln(p_{jkt})$
- E_t = the total expenditure of all imported meat
- P_t^* = price index

Results-China Beef Imports from its main Suppliers
Uncompensated own price, cross price and expenditure elasticities (e.)

Beef: own-price e. & cross-price e. within different sources

	Australia	Brazil	New Zealand	Uruguay	U.S.
Australia	-0.944***	-0.186***	0.0562**	0.0188	-0.0300**
Brazil	-0.581***	0.0532	-0.304***	-0.374***	0.0744*
New Zealand	0.151**	-0.303***	-1.003***	0.0314	-0.00213
Uruguay	0.0221	-0.235***	0.0212	-0.922***	-0.00389
U.S.	-0.0418	0.0526**	0.0043	0.00484	0.144

Beef: cross-price e. b/w different meats & expenditure e.

	Australia	Brazil	New Zealand	Uruguay	U.S.
Pork	0.631*	2.949***	0.26	0.244	-1.643*
Poultry	-0.985***	3.573***	1.445***	0.663*	1.716*
Expenditure	2.317***	2.834***	2.812***	2.700***	0.679***

Results-China Beef Imports from its main Suppliers

Uncompensated own price, cross price and expenditure elasticities (e.)

- Own-price elasticities for China's beef imports across main suppliers. It is negative & statistically significant for Australia (not elastic), New Zealand (elastic) & Uruguay (not elastic)
- Cross-price elasticities within specific meat across different sources, a substitutability relationship between Australia & New Zealand; Brazil & the U.S.
- Cross-price elasticities between different types of meat:
  - a substitutability relationship between pork & beef imports from Australia and Brazil
  - a substitutability relationship between poultry & beef imports from Brazil, New Zealand, Uruguay & the U.S.
- **Expenditure elasticities** are positive, statistically significant & elastic across all source countries, except the U.S.

Results-China Pork Imports from its main Suppliers

Uncompensated own price, cross price and expenditure elasticities (e.)

Pork: own-price e. & cross-price e. within different sources

	Canada	EU	U.S.
Canada	-0.697***	-0.0852	-0.248**
EU	-0.0599	-0.817***	-0.297***
U.S.	-0.136**	-0.375***	-0.442***

Pork: cross-price e. b/w different meats & expenditure e.

	Canada	EU	U.S.
Beef	0.0245	-0.134**	-0.275*
Poultry	-0.019	-0.479***	0.442
Expenditure	0.981***	2.152***	1.101***

Results-China Pork Imports from its main Suppliers
Uncompensated own price, cross price and expenditure elasticities (e.)

- Own-price elasticities for China's pork imports across main suppliers. Own-price elasticities are negative and statistically significant across all source countries (not elastic)
- Cross-price elasticities within specific meat across different sources, a weak complementary relationship between Canada & the U.S.; a weak complementary relationship between the EU & the U.S.
- Cross-price elasticities between different types of meat, beef and poultry are a weak complementary for source differentiated beef imports
- Expenditure elasticities elastic for the EU (strong) & the U.S., but inelastic for Canada

Results-China Poultry Imports from its main Suppliers

Uncompensated own price, cross price and expenditure elasticities (e.)

Poultry: own-price e. & cross-price e. within different sources

	Argentina	Brazil	U.S.
Argentina	-1.311***	-0.675**	1.271***
Brazil	-0.259**	-0.955***	-0.158
U.S.	0.181***	-0.0295	-0.834***

Poultry: cross-price e. b/w different meats & expenditure e.

	Argentina	Brazil	U.S.
Beef	-0.401**	0.859***	-0.0747
Pork	1.856***	-0.978***	-0.202
Expenditure	0.322**	1.122***	0.230**

Results-China Poultry Imports from its main Suppliers

Uncompensated own price, cross price and expenditure elasticities (e.)

- Own-price elasticities for China's poultry imports across main suppliers. It is negative and statistically significant across all source countries, Argentina (elastic).
- Cross-price elasticities within specific meat across different sources, a substitutability relationship between Argentina and the U.S.; a complementary relationship between Argentina and Brazil.
- Cross-price elasticities between different types of meat:
  - A complementary relation between beef and poultry from Argentina
  - A substitutability relationship between beef and poultry from the Brazil
  - A substitutability relationship between pork and poultry from Argentina
- Expenditure elasticities are positive, statistically significant across all sources.

China's Meat Import Projections from 2017 to 2025 (Base=2016)

- Countries with existing FTAs with China
  (New Zealand, Australia)

- China expands FTAs to its main meat suppliers, excluding the U.S. (Argentina, Brazil, Canada, the EU, and Uruguay)

Conclusions

- This research provides detailed information about China's meat import demand.

Beef

- Australia, Uruguay have the largest export growth potential (inelastic demand response to price changes, but elastic to changes in expenditure).
- Australia competes with New Zealand (substitute suppliers for China's beef imports); and the U.S. competes with Brazil in the China's beef import market.

Pork

- The EU has the largest export growth potential.
- No competing among main suppliers of pork, the EU, the U.S. and Canada in the pork import market.

Poultry

- Brazil has the largest export growth potential.
- The U.S. competes with Argentina in the poultry import market.

Thank You

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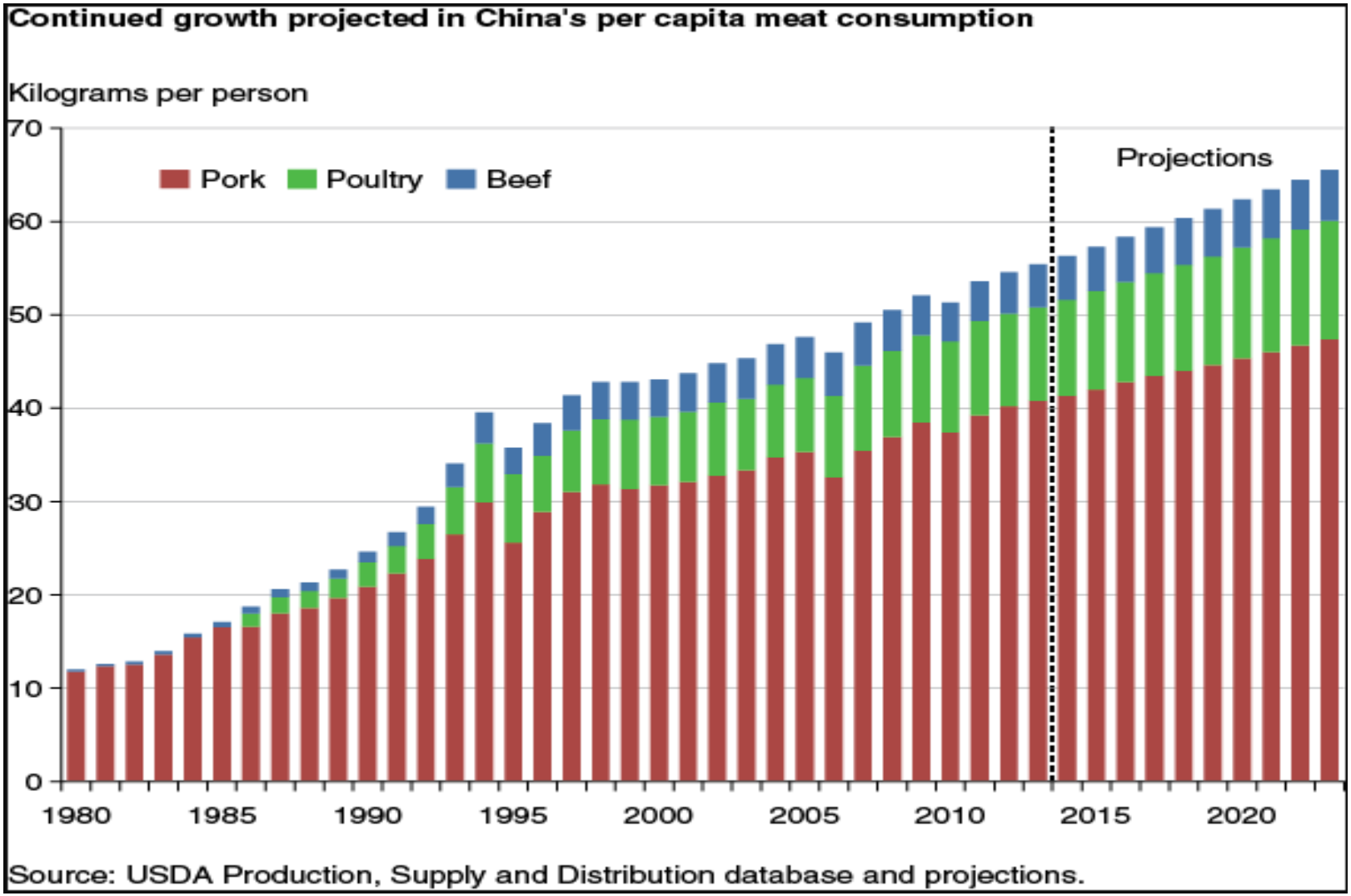
China's Meat Consumption



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