Selected Poster/Paper prepared for presentation at the Agricultural & Applied Economics Association's 2017 AAEA Annual Meeting, Chicago, Illinois, July 30-August 1, 2017

How Potential Changes in Cuba's Food Consumption Patterns May Affect U.S. and Cuban Agriculture, Trade, and Global Markets

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Poster Outline

- Research Objective
- Background – Cuba's Food Consumption Patterns and Cuba's Policies
- Methodology, Scenarios, Model
- Results and Implications for Cuba and World Markets
- Conclusion

Research Motivation and Objective

- Motivation:
  In 2015, the United States and Cuba re-established diplomatic relations, and in 2015 and 2016, the United States relaxed some trade restrictions and adopted new policies aimed at promoting growth in Cuba's private sector outside the state-run economy. A more normal bilateral relationship would allow Cuba to resume exporting agricultural products to the United States, while U.S. agricultural exporters would be able to develop commercial ties in Cuba that resemble their business relationships in other parts of the world.

- As Cuba's incomes increases, food consumption patterns are likely to change, with increasing demand for food products of higher quality including meats and dairy, which leads to improved meat production systems and greater feed demand. Cuba is constrained in its access to technology, limiting its ability to expand both feed and livestock production. The potential for increasing imports of meats and feeds thus may provide sizable new trade opportunities for the United States.

- Objective: To analyze the potential effects of Cuba's changing food consumption patterns on U.S. and Cuban agriculture, trade, and global markets out to the year 2026/27, with emphasis on poultry, pork, rice, and corn.

Selected U.S. ag. exports to Cuba: Pre-embargo vs today

	Annual averages			
	FY 1956-58	FY 2014-16	FY 1956-58	FY 2014-16
	Millions of U.S. dollars, nominal		*Annual average, metric tons*	
Total U.S. agricultural exports to Cuba	**139.2**	**218.4**	**640.1**	**412.3**
Animals and products	**40.6**	**115.8**	**119.9**	**135.2**
Chicken meat, fresh or frozen	0.2	113.5	0.2	134.4
Pork and pork variety meats	10.0	1.2	14.4	0.6
Lard	21.7	0.1	78.0	0.0
Oilseeds and products	**4.8**	**76.6**	**40.1**	**164.6**
Soybean meal	1.5	56.0	30.7	121.9
Soybeans	0.0	18.7	0.0	40.2
Grains and feeds	**53.9**	**24.8**	**353.6**	**112.2**
Corn	0.0	19.3	0.0	100.4
Rice	32.9	0.0	165.6	0.0
Wheat	5.7	0.0	84.0	0.0
Wheat flour	8.3	0.0	79.7	0.0
Distillers dried grains with solubles	0.0	1.5	0.0	5.6
Other feeds and fodders	0.0	3.1	0.0	6.1
Other agricultural products	**39.9**	**1.2**	**126.5**	**0.3**

Sources: USDA/FAS (1957, 1958, 1959, 2016)

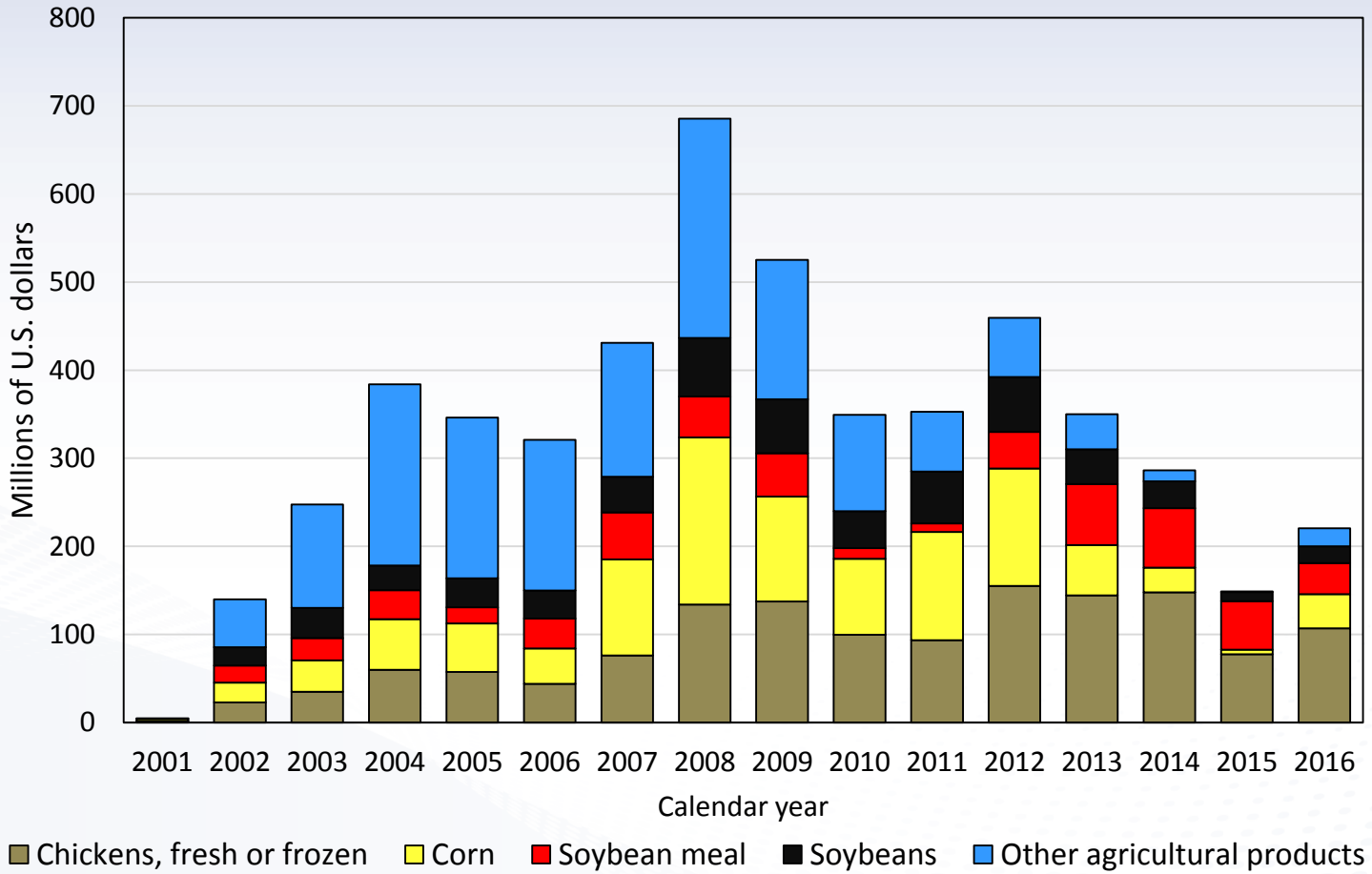
Relaxation of embargo in 2000 allowed U.S. agricultural exports to Cuba to resume

- Trade Sanctions Reform and Export Enhancement Act (TSRA) of 2000
  - Authorizes U.S. exports of food, medicine, and medical equipment to certain countries, including Cuba
  - Does not provide a legal framework for the resumption of U.S. agricultural imports from Cuba
- Cuban Liberty and Democratic Solidarity Act of 1996
  - Specifies conditions under which the economic embargo can be suspended or lifted (democratically elected government in Cuba)

Updated approach to U.S. relations with Cuba, 2015-16

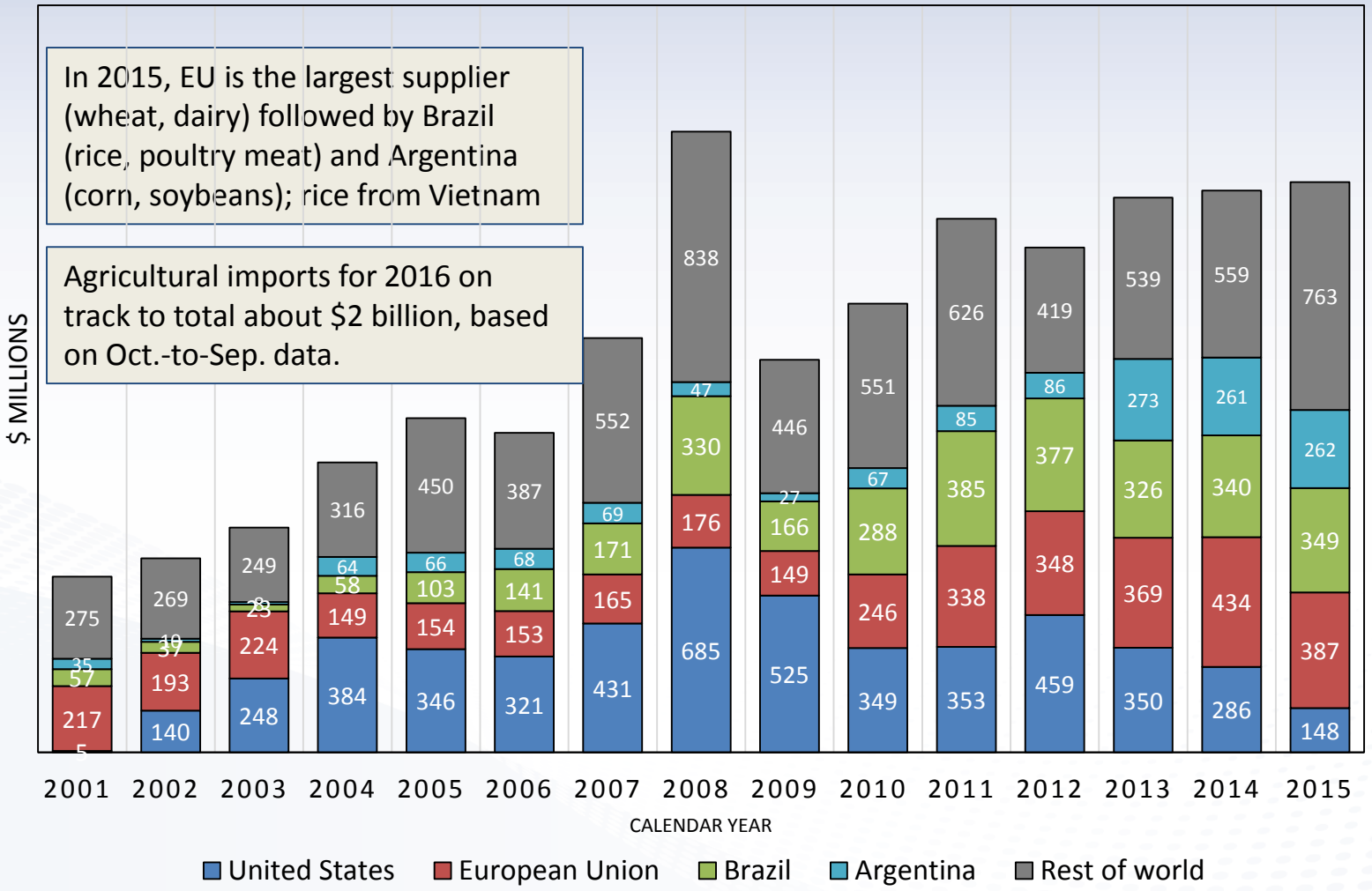
- Executive actions that could facilitate U.S. agricultural exports to Cuba:
  - Relaxation of travel restrictions
  - Higher ceilings on remittances to Cubans other close relatives
  - Revised definition of "cash-in-advance" that reduces Cuba's need to use 3rd-country financial institutions when paying for U.S. ag. products
  - Allowing sales of agricultural equipment to small farmers
  - Authorization of imports of coffee and certain textiles and apparel if produced by independent entrepreneurs
  - Allowing establishment of a physical presence in Cuba (i.e., an office or warehouse) to facilitate sales
- Reestablishment of diplomatic relations
- U.S.-Cuba agricultural memorandum of understanding (Mar. 2016): identified possible priorities for cooperation, such as sanitary and phytosanitary issues
- Establishment of USDA presence in U.S. Embassy in Havana
- Visits to Cuba by USDA subject matter experts: Animal health (Oct. 2016), plant health (Nov. 2016), natural resources (Dec. 2016)

U.S. agricultural exports to Cuba have declined over the last four years



Source: USDA/FAS, GATS database.

Cuba's agricultural imports have trended upward over the past decade, but the U.S. share has recently declined



Sources: USDA/FAS, and export data of national governments, as cited by Global Trade Information Services

United States Department of Agriculture, Economic Research Service

Possible reasons for limited recent growth of U.S. agricultural exports to Cuba

- Cuba is obtaining most of its agricultural imports from countries other than the United States
- Lower prices for many agricultural commodities (world exports to Cuba also down in recent years)
- Drop off in major hurricane activity
- Economic policy changes have been limited to date, even though there have been many changes
  - U.S. embargo remains in place
  - Cuban economic decision making is still highly centralized and rests with government entities

Cuba's approach to food security has resulted in a distinct dietary profile compared to neighboring countries

Product	Cuba 2011	Dominican Republic 2013	United States 2011	Mexico 2013
	Kilograms per capita per year			
Total, animal products and pulses	185.11	154.04	423.55	226.52
Total, animal products	166.49	142.45	420.33	214.13
Meat	49.66	47.20	117.61	62.23
Bovine meat	6.20	9.88	37.04	15.33
Mutton & goat meat	1.27	0.22	0.40	0.89
Pigmeat	19.08	9.51	27.93	15.23
Poultry meat	17.14	27.56	51.44	30.12
Meat, other	6.01	0.03	0.80	0.65
Offals	1.86	2.05	0.32	5.09
Animal fats	0.98	1.58	5.04	2.99
Butter, ghee	0.26	0.27	2.10	0.46
Cream	0	0	0	0.05
Fats, animals, raw	0.72	1.31	2.95	2.48
Eggs	9.58	7.19	13.89	18.34
Milk - excluding butter	97.73	73.75	256.77	111.87
Fish, seafood	5.68	8.09	21.65	10.46
Aquatic products, other	0	0	0	0.16
Infant food	0.02	1.01	0	0
Pulses	18.62	11.59	3.22	12.39

Source: FAOSTAT

The scenario developed demonstrates the potential impacts Cuba's changing consumption patterns may have on global markets

Income Growth:

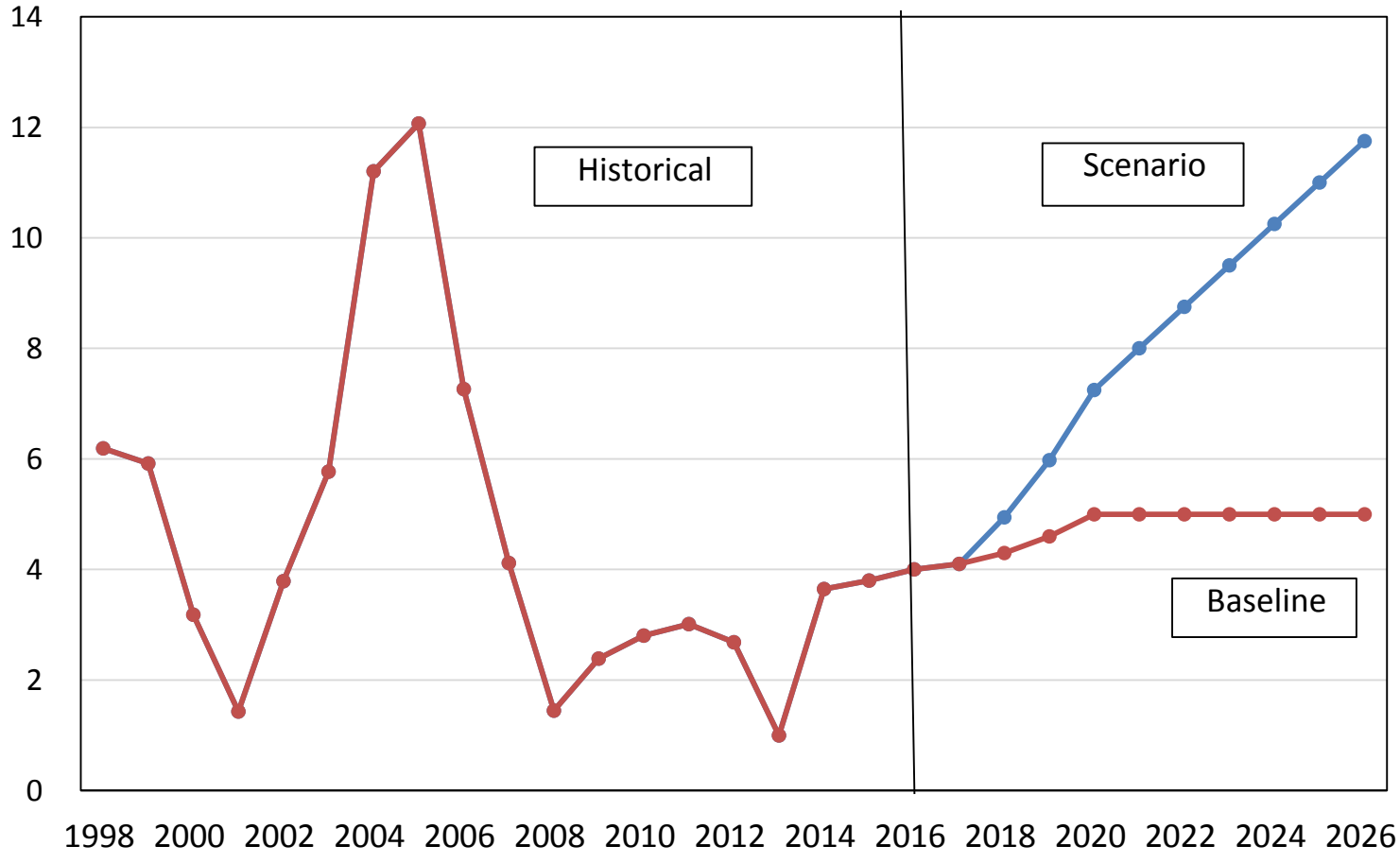
Baseline: GDP growth is 4.1 percent in 2017, increasing to 5 percent by 2020, and maintains 5 percent growth per year through 2026.

Scenario: GDP growth gradually increases from 4.3 percent in 2018 to 9 percent in 2022 and almost 12 percent growth rate by 2026.

The gradual increase in GDP growth rate indicates potential impact at different GDP levels.

Historically: Cuba had bursts of economic growth in the past for short periods. In 2004 and 2005, GDP growth was near 12 percent. But these were unique circumstances, and this growth rate was not maintained.

Cuba's GDP growth rate: baseline and scenario (percent)



Methodology and Modeling System

- The modeling system is a large scale, multi-country and multi-commodity partial equilibrium dynamic simulation model. Solves for global prices and trade and individual country models. Policy instruments are applied to individual models and solves globally.

Cuba Model

- The model solves for domestic production, consumption, ending stocks, trade and prices. The model covers 10 commodities: beef, pork, poultry, eggs, wheat, rice, corn, soybeans (including meal and oil), cotton, and sugar. The domestic prices for pork and poultry are solved to obtain equilibrium. The area harvested decision is based on expected net revenue or gross revenue. Feed demand is based on type of livestock operation.

Global and Country Model Description

Global Model: Linked Country Models ("Linker System")

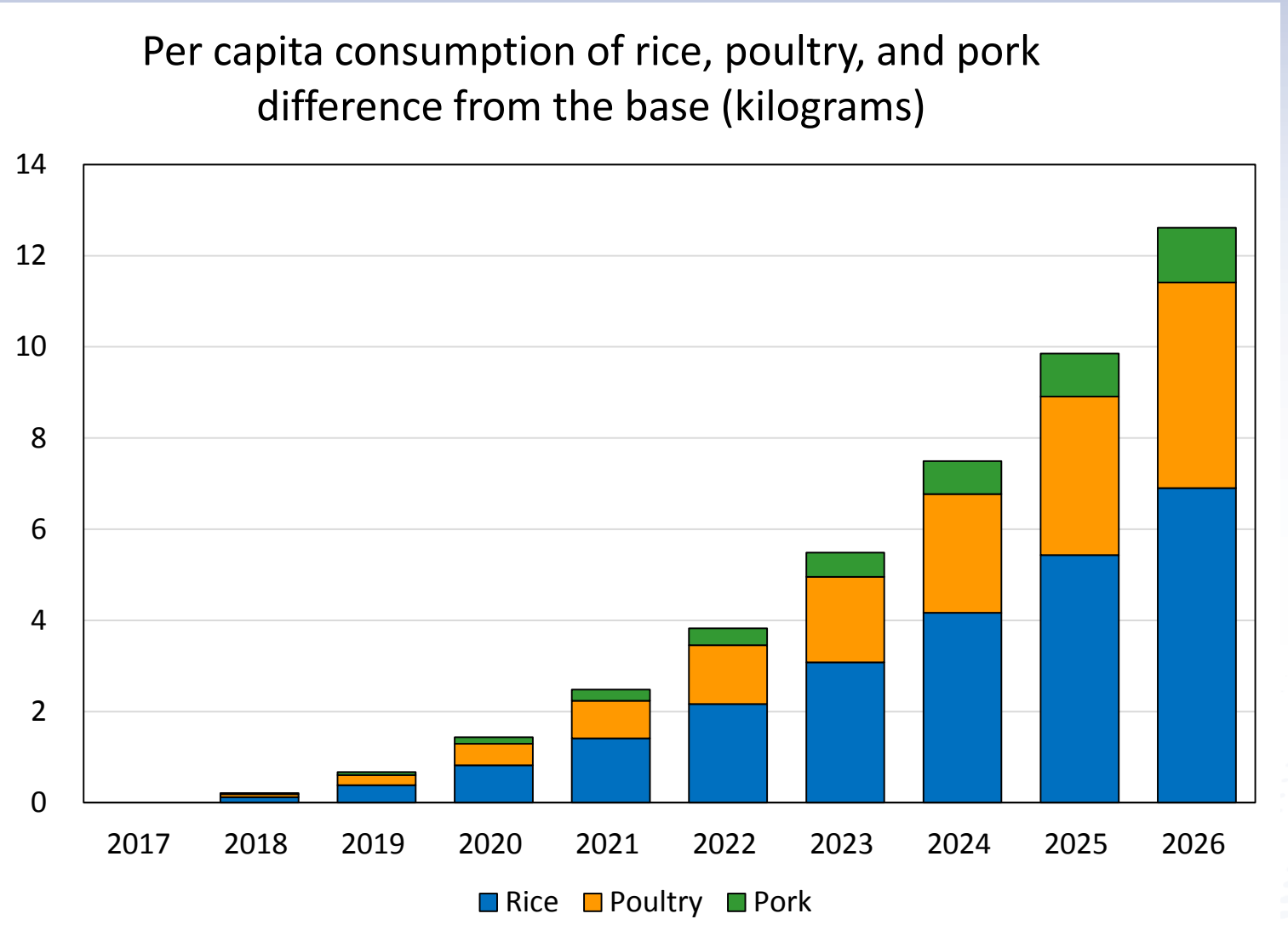
Annual model - dynamic partial equilibrium, 44 countries/regions, Linked with U.S. model, 24 traded commodity markets
Solves for prices & trade that clear world and country commodity markets Equilibrates: (Supply = Demand) and (Imports = Exports)

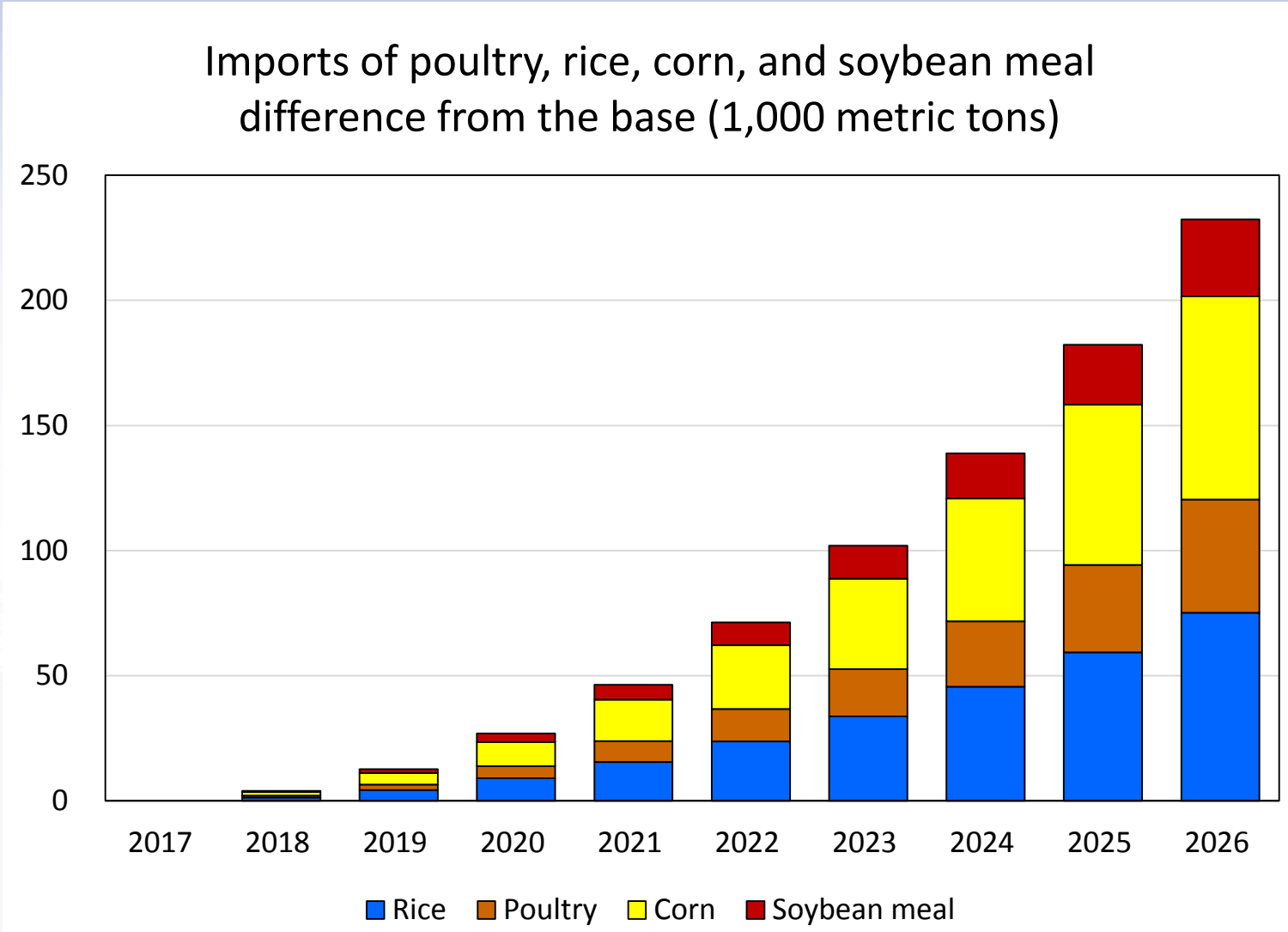
Policy (domestic and international) incorporated in individual countries, bioenergy (ethanol & biodiesel) demand developed in individual countries.

USDA's long-term commodity projections are developed by analysts specializing in modeling systems, commodity markets, countries and trade specialists.

Data are PS&D, FAO and selected country data, November 2016.

Results and Implications for Cuba and World Markets


Per capita consumption of rice, poultry, and pork
difference from the base (kilograms)
14
12
10
8
6
4
2
0
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
Rice
Poultry
Pork


Imports of poultry, rice, corn, and soybean meal difference from the base (1,000 metric tons)
250
200
150
100
50
0
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
Rice
Poultry
Corn
Soybean meal

Impact on Cuba's agriculture from increasing GDP growth to 12 percent

- Food consumption increased for all foods and feed demand expanded.
- Poultry and pork consumption increased 13.8 and 8.5 percent, respectively (49,000 tons and 13,000 tons) by 2026. Production increased close to 8.5 percent for both sectors.
- Rice and wheat consumption increased by 7.1 and 5.8 percent, respectively, by 2026, adding 74,800 and 50,700 metric tons to demand.
- Feed demand increased due to expanding livestock sectors. Corn and soybean meal feed demand increased by 5.1 and 4.8 percent, respectively, adding 65,820 and 30,690 metric tons to demand by 2026.

Impact on pork, poultry, rice, corn and soybean meal, difference from base					
Selected years	2018	2020	2022	2024	2026
Pork			Percent		
Production	0.17	1.10	2.82	5.24	8.32
Consumption	0.17	1.13	2.88	5.37	8.51
Imports	0.26	1.71	4.17	7.94	12.05
Consumer Price	0.37	2.39	6.04	11.03	17.13
Poultry					
Production	0.17	1.15	2.97	5.49	8.67
Consumption	0.28	1.84	4.61	8.47	13.28
Imports	0.30	1.95	4.86	8.90	13.91
Consumer Price	0.43	2.77	7.07	12.80	19.69
Rice					
Production	0.00	0.00	0.00	0.00	0.00
Consumption	0.14	0.93	2.39	4.47	7.11
Imports	0.25	1.66	4.24	7.82	12.25
Consumer Price	0.00	0.02	0.06	0.10	0.17
Corn					
Production	0.00	0.00	0.00	0.00	0.00
Feed Demand	0.10	0.69	1.72	3.23	5.13
Imports	0.15	0.98	2.45	4.56	7.20
Consumer Price	0.00	0.01	0.02	0.04	0.07
Soybean Meal					
Production	0.00	0.00	0.00	0.00	0.00
Feed Demand	0.10	0.65	1.65	3.03	4.82
Imports	0.12	0.79	1.99	3.68	5.89
Consumer Price	0.00	0.01	0.02	0.03	0.05

Pork and poultry sectors are solved by domestic prices for equilibrium, world prices affect the trade equations
Rice, corn, and soybean meal are solved by world prices for equilibrium.

Trade impact of 12 percent GDP growth rate by 2026

- Cuban poultry imports increased by about 45 thousand tons, or almost 14 percent. The global poultry market is large, and most countries respond to even small changes in global prices, resulting in a dampening global effect. Domestic prices increase close to 20 percent and world prices increased by less than half a percent.
- Corn imports increased by 7.2 percent, 81,000 tons by 2026. The United States provided 60,000 tons of corn, followed by Ukraine and Argentina. Many countries decreased imports by a small amount (500 to 5,000 tons). The global corn price increased by about 0.07 percent, quite small.
- Cuban rice imports increased by 12.3 percent or 74.8 thousand tons. The major exporting countries include Thailand, Vietnam, and the United States. Global price increased almost 0.2 percent.

Conclusion

If Cuba's economy would improve significantly, food consumption would increase for all commodities. Some commodities would exhibit modest expansion in domestic production; however, much of the increased demand would be met through increasing imports.

The impact on global prices would be quite small, mostly under 1 percent, which would lead to small changes for most countries. The major exporters would benefit the most, including the United States, Brazil, and Argentina, and for rice, Thailand, Vietnam and the United States.

Future research will feature the development of an Armington trade model to be used in the CCLS modeling system to ascertain more accurately the major beneficiaries of trade with Cuba as imports are increased. The pork and poultry markets will be modeled as open markets to global prices.