6-2018

# China's Agricultural Import Potential

Wendong Zhang
*Iowa State University*, wdzhang@iastate.edu

Dermot J. Hayes
*Iowa State University*, dhayes@iastate.edu

Minghao Li

# China's Agricultural Import Potential


## Abstract

As part of the current trade negotiations between the United States and China, China has suggested that it may lower trade barriers and increase agricultural imports from the United States. In this policy brief, we provide an overview of China's tariff and non-tariff trade barriers and estimate China's import potential if these barriers are removed. We find that China's importation of major U.S. commodities has the potential to increase significantly. For example, in our medium-growth scenario, China will potentially increase U.S. pork import value by $8.9 billion if all trade barriers are removed.



## Disciplines

Agricultural and Resource Economics

CARD Policy Briefs

Center for Agricultural and Rural Development
IOWA STATE UNIVERSITY

**June 2018**

**18-PB 23**

# China's Agricultural Import Potential

by Minghao Li, Wendong Zhang, and Dermot Hayes

Published by the Center for Agricultural and Rural Development, 578 Heady Hall, Iowa State University, Ames, Iowa 50011-1070; Phone: (515) 294-1183;
Fax: (515) 294-6336; Web site: www.card.iastate.edu.

*The authors would like to thank Chad Hart, Kelvin Leibold and Tom Dorr for discussions and suggestions on an earlier draft.*

**Abstract**
As part of the current trade negotiations between the United States and China, China has suggested that it may lower trade barriers and increase agricultural imports from the United States. In this policy brief, we provide an overview of China's tariff and non-tariff trade barriers and estimate China's import potential if these barriers are removed. We find that China's importation of major U.S. commodities has the potential to increase significantly. For example, in our medium-growth scenario, China will potentially increase U.S. pork import value by $8.9 billion if all trade barriers are removed.

## Introduction

From 2002 to 2016, the value of China's total agricultural imports (those with HS code 1~24, and 51~53) grew from $15.8 billion to $113.8 billion (UN Comtrade Database), and imports from the United States grew from $2.4 billion to $25.2 billion. Despite the continuous growth of overall imports, it is clear that China's import potential is far from fully realized. For instance, despite years of negotiation and a final agreement in 2017, China's beef imports from the United States are still very limited. Poultry imports from the United States were first reduced by an antidumping tariff in 2010, then completely discontinued due to an avian flu outbreak in the United States in 2015. Distillers grains and ethanol exports to China also declined after brief increases. More often than not, the reduced trade of these commodities is not due to market forces, but instead caused by trade barriers. If the trade values of all agricultural commodities return to their highest levels, overall U.S. agricultural exports to China would be 54% higher as shown in Table 1.

Trade disputes between the United States and China have escalated following President Trump's approval of tariffs on $50 billion worth of Chinese products (Swanson 2018). It is possible that a trade agreement can be reached, with China lowering trade barriers so as to increase agricultural imports from the United States. For example, Secretary of the Treasury Steven Mnuchin has said that China would increase imports of agricultural products by 35% to 40% this year (Crutsinger and Wiseman 2018). While these numbers are not official, they likely reflect Mnuchin's estimation and expectation based on his interactions with Chinese negotiators.

This policy brief estimates the potential for increases in U.S. agricultural exports to China in the case of a trade-liberalizing agreement.

**Table 1. Decline of Selected U.S. Exports to China from Peak Values**

| | 2017 value ($million) | Peak value (Year) ($million) | Percent change |
|---|---|---|---|
| Cotton | 976 | 3,429 (2012) | -72% |
| Distiller Grains | 63 | 1,632 (2015) | -96% |
| Coarse Grains (ex. corn) | 836 | 2,115 (2015) | -60% |
| Corn | 142 | 1,310 (2012) | -89% |
| Wheat | 349 | 1,283 (2013) | -73% |
| Poultry | 36 | 722 (2008) | -95% |
| Soybean Oil | 24 | 395 (2010) | -94% |
| Ethanol | 42 | 313 (2016) | -87% |
| Others | 21,626 | 25,927 | -17% |
| Total | 24,095 | 37,125 | -35% |

Source: USDA FAS Database

## Overview of China's Current Trade Barriers

### *Tariff Barriers*

In China, imported agricultural products face higher tariffs than other commodities, with an average tariff rate of 13.5% compared to an average tariff rate of 9.6% for nonagricultural products. Since China joined the WTO in 2001, the average tariff rate on imported agricultural products has decreased by 8.9% (see Figure 1). However, most of the tariff reduction was achieved before 2005; since then, the average tariff rate has not decreased. Currently, China's average tariff rate for agricultural products is about 6.3% higher than that of the United States (authors' calculation using data from the WTO tariff database).

For wheat and corn, the out-of-quota tariff rates are 65%, which essentially prohibits out-of-quota imports. At the beginning of 2017, the tariff rate on denatured ethanol increased from 5% to 30%, which reduced import value from the United States from $313 million to $42 million. For distillers grains, the antidumping and countervailing tariffs on U.S. products, which were applied in 2016, caused import value from the United States to decrease to less than 4% of the peak import value in 2015 (see Table 1). For meats, the highest tariff rates for certain pork and beef products were 12% to 25%, even before the recent additional 25% tariff on pork.

Beyond tariffs, China also has a 10%–16% discriminatory value-added tax (VAT) on agricultural imports (see Table 2). In the past two years, China decreased VAT twice, from 13%~17% to the current level (State Administration of Taxation 2018). For many exporting countries, accumulated VAT is refunded by the government when it is exported. This is not the case for the United States. This essentially adds VAT to the effective tariff rate faced by U.S. exporters.

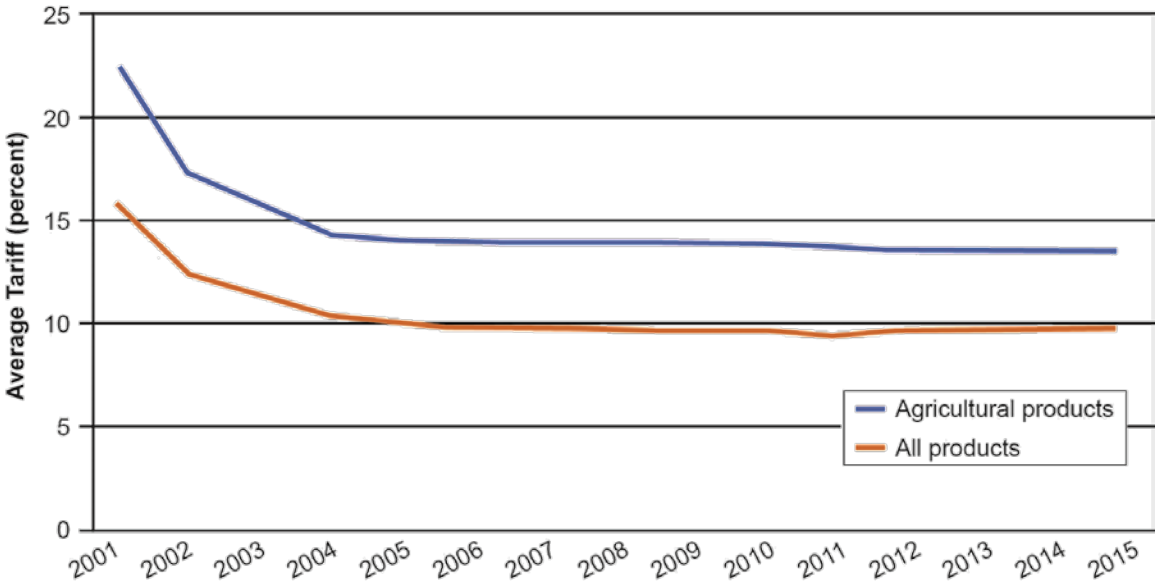


**Figure 1. The evolution of China's average tariff rate on agricultural products and on all products.**

Source: World Trade Organization Tariff Analysis Online.

### *Non-Tariff Barriers*

While China has substantial tariff barriers, various forms of non-tariff barriers are often the more stringent and binding constraints on trade. For major grains, including wheat, rice, and corn, China has a tariff rate quota (TRQ) system that allows certain amounts of imports at the low tariff rate of 1%. However, due to an opaque quota distribution process, the import quotas for these three grains have never been fully utilized even though import prices are lower than domestic prices. The United States initiated a WTO case in 2015 against China's TRQ for rice, wheat, and corn, and recently a panel has been established to rule on the issue.

In addition to TRQs and hidden regulatory restrictions, China also curtails imports with sanitary and phytosanitary (SPS) measures. In 2013, China began rejecting shipments of corn with genetic traits not yet approved by the Chinese government, and the ban was later expanded to distillers grains. Although the ban was subsequently lifted, import volume has yet to recover. In 2003, U.S. beef was banned due to the discovery of mad cow disease in the State of Washington. The ban persisted even as other countries, such as Korea, Japan, and Mexico, resumed imports from the United States. China's U.S. beef ban was finally lifted in 2017, yet other tariff and non-tariff constraints still remain (Lester and Zhu 2017). Poultry and eggs imported from the United States were banned in 2015 due to an U.S. avian influenza outbreak, and the ban is still in place. In addition to outright bans, China's SPS measures also contain standards that create barriers for U.S. producers. For example, China recently reduced the amount of foreign material allowed in U.S. soybeans from 2% to 1%, which is estimated to increase handling cost by 15 cents per bushel (Hirtzer 2017).

In addition to tariff and non-tariff trade barriers, China has a myriad of agricultural subsidies that give domestic producers an edge over foreign competition. Subsidies are beyond the scope of this policy brief, and therefore we refer readers to Huang and Yang (2017) for a recent overview.

## Potential Import Growth by Removing Trade Barriers

As noted above, China has reportedly offered to increase the value of agricultural imports from the United States by 35%~40% over the next few years. How does this increase compare to China's full import potential if all trade barriers were removed? How much could China's imports increase in the long run? In this section, we estimate China's import potential under complete trade liberalization.

If all Chinese trade barriers were removed, domestic prices would fall and international prices would increase due to increased demand from China. Given a reduction in the domestic price after trade liberalization ($\%\Delta P$, the percentage change from the original price), the extra import demand ($\Delta Import$) can be estimated by the sum of the increase in domestic consumption and decrease in domestic production. The responsiveness of domestic consumption (production) to a price change is determined by the demand (supply) elasticity $E_d$ ($E_s$), which measures the percentage change in consumption (production) as a result of a price change. Fortunately, the price elasticities of agricultural commodities in China have been published in the literature, with dozens of elasticity estimates available for each major commodity. We use the mean of demand elasticity estimates described in the meta-study by Chen et al. (2016) and the supply elasticities estimated by Zhuang and Abbot (2007) (see Table 3). Consumption and production data are averaged over 2015–2017 and are from USDA Production, Supply and Distribution (PS&D) Database.

**Table 2. China's Tariff Rates and Value-added Tax on Selected U.S. Products**

| | Tariff | VAT | Quota (MMT) | In-quota tariff | Out-of-quota tariff |
|---|---|---|---|---|---|
| Soybeans | 3% | 10% | | | |
| Cotton [a] | | 10% | 0.894 | 1% | 40% |
| Wheat | | 10% | 9.636 | 1% | 65% |
| Corn | | 10% | 7.2 | 1% | 65% |
| Ethanol (non-beverage) | 30%~40% | 16% | | | |
| Distiller grains [b] | 5% | 0% | | | |
| Pork | 12%~25% | 10% | | | |
| Beef | 2%~25% | 10% | | | |
| Poultry [c] | 0~20% | 10% | | | |

Source: WTO tariff database, various issues of USDA GAIN reports, and the Ministry of Agriculture of China

*Notes*: tariff rates as of 2017, VAT as of June 2018. MMT: million metric tons.

[a] In some years, China had additional quotas as high as 2.7 MMT. The out-of-quota tariff for cotton is determined by a sliding tariff, with 40% being the upper bound.

[b] Distiller grains from the U.S. are also subject to an antidumping tariff of 42.2%~53.7% and a countervailing tariff of 12%.

[c] Currently, poultry imports from the U.S. are still banned due to avian influenza, and therefore the tariff for poultry is not relevant.

Using this method, we estimate that complete removal of trade barriers would increase corn imports from the United States by 16.5–49.6 MMT (0.65– 1.95 billion bushels, $3.7–$11.1 billion), wheat imports by 8.9–26.8 MMT (0.33–0.98 billion bushels, $2.4–$7.3 billion), beef imports by 0.2–0.7 MMT (0.44–1.5 billion pounds, $0.9–$2.7 billion), pork imports by 2.2–6.5 MMT (4.9–14.3 billion pounds, $4.5–$13.4 billion), and chicken imports by 0.6–1.9 MMT (1.3–4.2 billion pounds, $4.9–$14.8 billion). Even with such a large increase in imports, China maintains a reasonable level of self-sufficiency: in the medium import growth scenario, import reliance ranges from 8.1% for beef to 19.8% for wheat.

For commodities with no demand or supply elasticity and/or price information readily available, an alternative method is to use import demand elasticity ($E_{imp}$). Instead of separately calculating consumption and production changes, import demand elasticity directly tells us the percentage change of import in response to a change in import price. We simulate a price decline ($\%\Delta P$) that equals to 25% (low), 50% (middle), and 75% (high) of the effective China-U.S. tariff gap (which is the sum of the gap between China's and U.S. tariff levels, plus China's VAT). The import increase is calculated as:

$$\Delta Import = Import * E_{imp} * \%\Delta P$$

**Table 3. Data and Parameters Used in Our Projection**

| | Consumption (MMT) | Production (MMT) | Supply elasticity | Demand elasticity | China price (1,000 yuan/ton) | Import price (1,000 yuan/ton) | Price gap | U.S. Share |
|---|---|---|---|---|---|---|---|---|
| Corn | 230 | 220 | 0.183 | -0.805 | 2.0 | 1.4 | 29.8% | 98.5% |
| Wheat | 116 | 130 | 0.348 | -0.742 | 2.9 | 1.7 | 40.3% | 67.7% |
| Beef | 8 | 7 | 0.63 | -0.798 | 26.6 | 23.3 | 12.4% | 76.0% |
| Pork | 55 | 54 | 0.184 | -0.58 | 18.6 | 13.3 | 28.4% | 72.2% |
| Chicken | 12 | 12 | 0.268 | -0.72 | 62.9 | 49.2 | 21.8% | 96.6% |

*Note*: Domestic consumption and production data are from USDA PS&D averaged over 2015~2017, supply elasticity estimates are from Zhuang and Abbot (2007), and demand elasticities are from Chen et al. (2016). China's prices are from the Ministry of Agriculture of China. Delivery prices for imported corn and wheat are from the MOA, and delivery prices for imported meats are the authors' calculations based on U.S. wholesale prices and delivery costs. All price data are also averaged over 2015~2017. The U.S. market share is at the highest value since 2002.

Import demand elasticities are estimated by Ghodsi et al. (2016) at the HS6 level for most commodities. Earlier import demand elasticities estimated using similar methods (Kee et al. 2008) are the underlying parameters in the widely used SMART model developed by the World Bank. For commodities with missing elasticity estimates, we first use earlier estimates from Kee et al. (2008). If elasticity is still missing, we use median import elasticity for all agricultural commodities. Using this method, we estimate that if China's effective tariff rates were reduced to U.S. levels, cotton import value would grow by $0.11–$0.33 billion dollars, ethanol import value by $0.08~$0.22 billion dollars,[1] distillers grains import value by $0.18–$0.54 billion dollars, and the total import value of all other commodities by $0.87–$2.6 billion (Table 4).

## Conclusions

This policy brief summarizes China's trade barriers to agricultural products imported from the United States, and estimates the potential for U.S.-China agricultural exports to grow if these barriers were removed. We show that China has imposed various tariff and non-tariff barriers that severely limit trade opportunities for major U.S. exports. These non-tariff barriers include, but are not limited to, unfulfilled quotas for grains and SPS measures on distillers grains, beef, and chicken. Using two complementary methods, we estimate that there is a large growth potential for U.S. agricultural exports to China if the barriers are removed. For example, in our medium-growth scenario, corn export value to China could increase by $7.4 billion and pork export value by $8.9 billion. The total value of potential exports from the United States is $35.3 billion, or 9.3% of the United States' trade deficit with China in 2017 ($376 billion).

**Table 4. Predicting China's Import Potential from the United States**

| | Increase in import quantity | | | Increase in import value ($billion) | | |
|---|---|---|---|---|---|---|
| | Low | Middle | High | Low | Medium | High |
| Corn | 16.5 MMT | 33.1 MMT | 49.6 MMT | 3.7 | 7.4 | 11.1 |
| Wheat | 8.9 MMT | 17.9 MMT | 26.8 MMT | 2.4 | 4.9 | 7.3 |
| Beef | 0.2 MMT | 0.5 MMT | 0.7 MMT | 0.9 | 1.8 | 2.7 |
| Pork | 2.2 MMT | 4.3 MMT | 6.5 MMT | 4.5 | 8.9 | 13.4 |
| Chicken | 0.6 MMT | 1.3 MMT | 1.9 MMT | 4.9 | 9.9 | 14.8 |
| Cotton | 55 TMT | 110 TMT | 165 TMT | 0.11 | 0.22 | 0.33 |
| Ethanol | 110 Mil. L | 220 Mil. L | 330 Mil. L | 0.08 | 0.15 | 0.22 |
| Distiller grains | 0.66 MMT | 1.33 MMT | 2.0 MMT | 0.18 | 0.36 | 0.54 |
| Others | | | | 0.87 | 1.7 | 2.6 |
| Total | | | | 17.6 | 35.3 | 53.0 |

*Note*: Projections for corn, wheat, beef, pork, and chicken are calculated using the domestic elasticity method; projections for cotton, ethanol, distiller grains, and others are calculated using the import elasticity method. See text for descriptions.
MMT: million metric tons; TMT: thousand metric tons; Mil. L: million liters

[1] Our calculation does not take China's recent ethanol mandate into account. See Li et al. (2017) for details.

## References


Chen, D., D. Abler., X. Yu., D. Zhou, and W. Thompson. 2015. "A Meta-analysis of Food Demand Elasticities for China." *Applied Economic Perspectives and Policy* 38(1):50–72.

Ghodsi, M., J. Grübler, and R. Stehrer. 2016. "Import Demand Elasticities Revisited." Vienna Institute for International Economic Studies.

Grutsinger, M., and P. Wiseman. 2018. "Steven Mnuchin Says U.S. and China Will Put Trade War on Hold." *Time May 20, 2018*. http://time.com/5284925/steven-mnuchin-china-trade-war/

Hertzer, M. 2017. "UPDATE 2-China Tightens Import Specifications on U.S. Soybeans –USDA." *Rueters, December, 2017.*

Huang, J. and Yang, G., 2017. "Understanding Recent Challenges and New Food Policy in China." *Global Food Security*, 12:119-126.

Lester, S., and H. Zhu. 2017. "Where's the Beef? Finding a Better Way to Resolve U.S.-China Trade Conflicts." CATO Institute Free Trade Bulletin No. 71.

https://www.cato.org/publications/free-trade-bulletin/wheres-beef-finding-better-way-resolve-us-china-trade-conflicts

Kee, H. L., A. Nicita, and M. Olarreaga. 2008. "Import Demand Elasticities and Trade Distortions." *The Review of Economics and Statistics* 90(4):666–682.

Li, M., W. Zhang, and C. Hart. 2018. "What Have We Learned from China's Past Trade Retaliation Strategies?" *Choices*, 33(2). http://www.choicesmagazine.org/choices-magazine/submitted-articles/what-have-we-learned-from-chinas-past-trade-retaliation-strategies.

Li, M., W. Zhang, D. Hayes, R. Arthur, Y. Yang, and X. Wang. 2017. "China's New Nationwide E10 Ethanol Mandate and Its Global Implications." *CARD Agricultural Policy Review, Fall 2017*

State Administration of Taxation. 2018. "The Notification for Adjustments of Import Value-Added Tax." http://www.chinatax.gov.cn/n810341/n810755/c3377945/content.html.

Swanson, A. 2018. "U.S. and China Expand Trade War as Beijing Vows to Match Trump's Tariffs." *New York Times June 15, 2018*. https://www.nytimes.com/2018/06/15/us/politics/us-china-tariffs-trade.html?action=click&module=Top%20Stories&pgtype=Homepage

Taheripour, F. and Tyner, W. E. 2018. "Impacts of Possible Chinese 25% Tariff on U.S. Soybeans and Other Agricultural Commodities." *Choices*, 33(2)

UN Comtrade Database, https://comtrade.un.org/data/, accessed June 2018.

Zheng, Y., D. Wood, H. H. Wang, and J. P. H. Jones. 2018. "Predicting Potential Impacts of China's Retaliatory Tariffs on the U.S. Farm Sector." *Choices* 33(2).

Zhuang, R., and P. Abbott. 2007. "Price Elasticities of Key Agricultural Commodities in China." *China Economic Review* 18(2):155–169.