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Marinos E. Tsigas
Office of Economics
U.S. International Trade Commission

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*address correspondence to*:
Office of Economics
U.S. International Trade Commission
Washington, DC 20436 USA

# How Would Food Markets Be Affected by Liberalizing Trade in Processed Foods?

by

Marinos E. Tsigas[1]

*Abstract:* This paper discusses some of the implications of liberalizing trade in processed foods in the context of the upcoming WTO trade negotiations. Simulated impacts suggest that a 30 percent reduction in farm and food tariffs would benefit U.S. farming in terms of output, net exports and income. The U.S. processed food sector would decline, but net exports of processed foods would increase. A 30 percent reduction in farm tariffs coupled with tariff de-escalation in farm-processed foods trade would strengthen further the U.S. farm economy as well as net exports of processed foods. The U.S. processed foods sector would gain the most when a 30 percent reduction in farm tariffs is coupled with elimination of tariff escalation in farm-processed foods trade.

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[1] Views expressed herein are those of the author and do not necessarily represent the views of the U.S. International Trade Commission or any of its Commissioners. The author would like to thank Bob Koopman for comments on an earlier draft of this paper. Address correspondence to Marinos Tsigas, U.S. ITC, 500 E Street, SW, Room 602 S, Washington, DC 20436. Phone: 202-708-3654, Fax: 202-205-2340, Email: mtsigas@usitc.gov.

## Introduction

In the United States, the processed food and beverages sector employs 2.5 million workers with U.S. sales of more than $463 billion in 1998. Each dollar in exports of processed foods generates $1.57 in domestic economic activity as compared to $0.81 for bulk commodities.[2] Global trade in processed foods is larger and growing faster than trade in bulk commodities. This growth is fueled by income growth, the globalization of the agro-food sectors, changes in working habits and leisure time, and varied lifestyles.

Globally, import tariffs on processed foods remain among the highest in the agricultural sector. This situation is referred to as tariff escalation, meaning that import tariffs increase with the level of processing. Despite the increased prominence of trade in processed food products, the 1994 Uruguay Round Agreement on Agriculture (URAA) did little to address the impediments to trade and investment in processed foods. Processed foods were barely on the Uruguay Round agenda, despite its agricultural focus and that processed products are similarly (as farm commodities are) covered under Chapters 1-24 of the Harmonized System (HS) of Tariff Classification. Participating countries tended to concentrate high percentage tariff reductions on products where tariffs were already low and minimized cuts on sensitive items with high tariffs.

As a result of the URAA, the degree of tariff escalation has been reduced but high levels of tariff escalation still remain after the implementation of the URAA.[3] An example of tariff escalation is the case of corn and corn flakes imports into Taiwan: the import tariff on corn is between 2.5 and 1 percent, whereas the tariff on corn flakes is between 35 and 30 percent.[4]

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[2] Appendix E: Economic Activity Triggered by Agricultural Trade, Rural Conditions and Trends, 9(3) Economic Research Service, USDA, *http://www.ers.usda.gov/epubs/pdf/rcat/rcat93/rcat93n.pdf.*

[3] Lindland, J., 1997, "The Impact of the Uruguay Round on Tariff Escalation in Agricultural Products," Trade Policy Group, Commodity Policy and Projections Service, Commodities and Trade Division, Food and Agriculture Organization, Rome, February.

[4] Taiwan, HS codes 1005.90.00004 and 104.23.00006, Asia-Pacific Economic Cooperation Tariff Database, *http://www.apectariff.org*.

On the export side, some countries are subsidizing exporters of processed foods, which has similar impacts to import tariff escalation. An example is the European Union (EU), where export subsidies on canned ham and luncheon meat allow EU manufacturers to sell below domestic cost in other markets.[5] Thus, non-EU manufacturers forego domestic business, which ultimately impacts non-EU pork producers. The result of tariff escalation is increased protection of labor and capital, which changes the sectoral distribution of resources against countries with relatively abundant supplies of raw materials. Trade in processed foods is also affected by border protection for agricultural commodities. Relatively high tariffs on basic dairy and sugar products put increasing pressure on domestic downstream food manufacturers who bear the inflated cost of inputs. As a result those food manufacturers can not compete in the world market. Often they move some or all of their operations overseas where inputs are less expensive.

This paper discusses some of the impacts of multilateral reduction of import tariffs on farm and processed food trade with emphasis on reducing the degree of tariff escalation between farm and processed food commodities. The paper does not consider any changes in export subsidies or domestic support programs.

[5] In September 1999, the subsidy rates were 0.62 EURO/kg for canned ham, and 0.25 EURO/kg for luncheon meat, Canadian International Trade Tribunal, *http://www.citt.gc.ca/dumping/Reviews/Orders/rr99002e/rr99002e.htm#I3*.

**Impact of trade liberalization in farm and food trade**

We assess the impacts of trade liberalization in farm and food trade using a comparative static, global trade framework. We use the Global Trade Analysis Project (GTAP), which ensures economic consistency at the global and national levels by considering international trade linkages, as well as inter-sectoral linkages (e.g., from farms to food processing and to consumers).[6]

The countries and regions under consideration are Canada, the United States, Mexico, Japan, Australia and New Zealand, the European Union, and three regions representing the rest of the Americas, the rest of Asia, and the rest-of-the-world (ROW). In terms of sectoral coverage, there are eleven aggregate farm sectors and six aggregate processed foods sectors.[7] The rest of the economy is represented with seven sectors.[8] The data represent the global economy in 1997 and they are from version 5 of the GTAP database.[9]

Farm and processed foods tariffs. Table 1 shows import tariffs applied on the seventeen aggregates of farm commodities and processed foods specified for this paper.[10] For most importing regions in table 1, the highest tariff is found in the processed foods sectors. In Mexico, and the European Union, however, the highest tariff is found in farm commodities.

It is difficult to determine whether the data in table 1 suggest tariff escalation because our sectoral specification does not allow to track commodities along processing channels, from farm commodities (e.g., wheat grain) to semi-processed (wheat flour) and processed foods (pasta). This is a

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[6] Hertel, T.W., editor (1997). Global Trade Analysis: Modeling and Applications, Cambridge University Press.

[7] The farm sectors are: paddy rice; wheat; other grains; oilseeds; sugar crops; vegetables, fruits and nuts; fiber crops; other crops; raw milk; wool and silk; and other livestock. The processed foods sectors are: meats; dairy products; vegetable oils and fats; processed rice, sugar; and other processed foods.

[8] Fishing, other natural resource based industries, beverages and tobacco, textiles and apparel, other manufacturing, trade services, other services.

[9] Dimaranan, B. V. and R. A. McDougall (2001). *Global Trade Assistance and Production: The GTAP 5 Data Base*, Center for Global Trade Analysis, Purdue University.

[10] Tariffs for farm and processed foods sector in the GTAP database are based on the Agricultural Market Access Database (AMAD, *http://www.amad.net/index.htm*).

weakness of our approach, but on the other hand, our approach allows the assessment of broad trade policy reform, which cannot be accomplished satisfactorily with models of specific market channels of farm and processed food processing. Nevertheless, the data used here suggest that for most importers, tariffs applied on processed foods are on average higher than tariffs applied on farm commodities. The trade-weighted average tariff applied by the European Union on farm commodities is 4.3 percent whereas the trade-weighted average tariff applied on processed foods is 9.8 percent (table 1).

We next perform three simulations of trade policy reform. First, we simulate a 30 percent reduction in all farm and processed food tariffs. To consider the impact of tariff de-escalation in the context of the next round of global agricultural trade negotiations, we also perform two simulations where farm tariffs are cut by 30 percent and processed foods tariffs are cut by more than 30 percent. To simulate the impacts of reducing import tariffs, the model is solved simultaneously at the level of the nine regions and 24 sectors. Results reported in this paper, however, have been aggregated across industries to two aggregates: farm and processed foods.

Farm and processed foods trade liberalization. Table 2 reports selected simulated impacts of cutting tariffs for all farm commodities and processed food products by 30 percent. As a result, domestic market prices would decline the most in high-tariff importers (e.g., Japan, rest of Asia and the rest of the world). The aggregate of Australia and New Zealand, a low-tariff and net exporter of farm and food commodities, experiences the largest increase in domestic market prices and supply.

Exports of U.S. farm commodities and processed foods would increase by about 5 percent, while U.S. imports of processed foods would increase by about 6 percent. The net trade impact would be that the trade balance of farm commodities would increase by $1.3 billion and the trade balance of processed food products would increase by $167 million (table 2).

Returns to land in U.S. agriculture would increase by about 6.7 percent. Returns to labor and capital would not be affected significantly in this simulation, because U.S. agriculture and food

processing are relatively small sectors in terms of national labor and capital employment. The net impact would be that wages and returns for all primary factors in U.S. agriculture would increase by 2.16 percent (table 2).

The net impact on U.S. farm production would be that it increases by 0.52 percent (table 2). Tariff cutting by U.S. trade partners would cause U.S. farm production to increase, but tariff cutting by the U.S. itself would cause U.S. farm production to decline. U.S. processed food production declines by 0.06 percent; the negative impact of tariff cutting by the U.S. dominates the positive impact of tariff cutting by U.S. trade partners.

Tariff escalation. A 30 percent cut in tariffs on all farm and processed food trade implies that the degree of tariff escalation does not change due to the cut. To examine the implications of reducing the degree of tariff escalation in the context of global trade negotiations in food and agriculture, we simulate the impacts of two trade liberalization scenarios. First, we consider the impacts of a 30 percent cut in all farm tariffs which is coupled with deeper (more than 30 percent) cuts in processed food tariffs so that the degree of tariff escalation is reduced by 30 percent. Second, we consider the impacts of a 30 percent cut in all farm tariffs which is coupled with cuts in processed food tariffs so that tariff escalation is eliminated.

The framework used here is quite aggregate in its industry coverage. Commodity transformations are not greatly delineated, e.g., we do not observe grain millers demanding wheat grain to produce wheat flour which is then used by pasta producers. Instead, the linkages between farm and processed foods are broadly and comprehensively captured. Thus, in the following two simulations, import tariffs for all farm commodities are reduced by 30 percent and tariff cuts for processed foods are based on the average degree of tariff escalation shown in table 1.[11]

[11] The degree of tariff escalation is defined here as $(t_{food} - t_{farm})/t_{farm}$, where $t_{food}$ and $t_{farm}$ are the trade-weighted average tariffs applied on processed food and farm commodities, respectively.

Farm and processed foods trade liberalization and tariff de-escalation. First, we consider the impact of cutting farm tariffs by 30 percent and reducing the degree of tariff escalation by 30 percent. This implies that for tariff-escalating importers, tariffs on processed foods are cut by more than 30 percent. For example, European Union processed food tariffs are cut by 42 percent, whereas tariffs applied by the U.S. are cut by 32 percent.

Simulated impacts suggest that exports of U.S. farm commodities would increase by more than 5 percent and exports of U.S. processed foods would increase by about 7 percent; imports of processed foods would increase by about 7 percent (table 3). The net trade impact would be that net exports of farm commodities would increase by $1.4 billion and net exports of processed food products would increase by $325 million. The net impact on U.S. farm production would be that it increases by 0.55 percent. U.S. processed food production declines by 0.02 percent. Returns to land, labor, and capital in US agriculture would increase by 2.27 percent.

Farm and processed foods trade liberalization and elimination of tariff escalation. Next we simulate a 30 percent cut in tariffs applied on farm commodities coupled with the elimination of tariff escalation in farm-food products. In this simulation, European processed food tariffs are cut by 69 percent, whereas U.S. tariffs are cut by 35 percent. As a result, U.S. exports of farm commodities would increase by 6 percent and exports of processed foods would increase by 10 percent; U.S. imports of processed foods would increase by 7 percent. The net trade impact would be that the U.S. trade balance of farm commodities would increase by $1.4 billion and the trade balance of processed food products would increase by $920 million (table 4). The net impact on U.S. farm production would be that it increases by 0.65 percent. U.S. processed food production increases by 0.12 percent. Returns to land, labor, and capital in U.S. agriculture would increase by 2.6 percent (table 4).

## Conclusions

This paper assesses some of the implications of liberalizing trade in processed food products in the context of the upcoming WTO (World Trade Organization) round of trade negotiations. An aggregate global trade model was used to simulate the impacts of reducing farm and food tariffs by 30 percent and reducing the degree of tariff escalation in farm-processed foods trade.

Our results suggest that a 30 percent reduction in farm and food tariffs would benefit U.S. farming in terms of output, net exports and income. The U.S. processed food sector would decline a little, but net exports of processed foods would increase. A 30 percent reduction in farm tariffs coupled with tariff de-escalation in agricultural tariffs would strengthen further the U.S. farm economy as well as net exports of processed foods. The U.S. processed foods sector would gain the most when a 30 percent reduction in farm tariffs is coupled with elimination of tariff escalation in agriculture.

**Table 1. Import tariffs, percent**

| | Canada | USA | Mexico | Rest of Americas | Australia New Zealand | Japan | Rest of Asia | EU | ROW |
|---|---|---|---|---|---|---|---|---|---|
| Farm sectors | | | | | | | | | |
| Paddy rice | 0.0 | 4.9 | 15.0 | 19.6 | 0.8 | 409.0 | 3.8 | 43.1 | 14.3 |
| Wheat | 62.8 | 2.6 | 67.0 | 5.8 | 0.0 | 249.2 | 15.5 | 10.7 | 41.4 |
| Other grains | 8.9 | 0.6 | 38.4 | 11.2 | 0.8 | 20.2 | 130.8 | 8.3 | 27.0 |
| Oil seeds | 0.0 | 17.7 | 3.1 | 6.7 | 1.3 | 76.4 | 64.8 | 0.0 | 33.4 |
| Sugar crops | 0.0 | 0.7 | 23.0 | 11.1 | 0.0 | 0.0 | 7.7 | 110.8 | 24.8 |
| Vegetables, fruits and nuts | 1.9 | 4.7 | 17.9 | 13.0 | 1.7 | 44.9 | 24.8 | 5.5 | 46.7 |
| Fiber crops | 0.0 | 9.7 | 6.0 | 7.6 | 0.5 | 0.0 | 6.6 | 0.0 | 5.1 |
| Other crops | 2.4 | 21.5 | 10.2 | 9.2 | 2.7 | 22.1 | 36.5 | 2.1 | 25.0 |
| Raw milk | 0.0 | 0.0 | 0.0 | 4.5 | 0.0 | 0.0 | 0.9 | 0.0 | 23.4 |
| Wool and silk | 2.3 | 0.9 | 8.2 | 10.8 | 0.6 | 54.7 | 13.3 | 0.0 | 8.7 |
| Other livestock | 17.7 | 0.7 | 10.2 | 7.7 | 0.3 | 26.1 | 9.2 | 4.2 | 37.6 |
| *Farm sectors average* | *3.0* | *13.8* | *8.9* | *9.2* | *1.8* | *58.4* | *35.6* | *4.3* | *33.8* |
| Processed food sectors | | | | | | | | | |
| Meats | 28.0 | 4.7 | 48.5 | 14.9 | 3.8 | 48.8 | 16.2 | 11.3 | 58.6 |
| Dairy products | 214.8 | 42.5 | 37.5 | 20.4 | 3.0 | 287.0 | 18.9 | 6.5 | 68.3 |
| Vegetable oils & fats | 8.6 | 4.3 | 19.2 | 13.9 | 2.6 | 6.6 | 31.6 | 5.1 | 27.7 |
| Processed rice | 0.7 | 5.3 | 15.0 | 20.2 | 0.9 | 409.0 | 33.0 | 35.0 | 10.0 |
| Sugar | 4.9 | 53.4 | 4.1 | 17.0 | 1.4 | 116.1 | 18.4 | 36.2 | 18.2 |
| Other food products | 14.1 | 11.4 | 17.9 | 15.7 | 5.1 | 38.3 | 20.5 | 9.2 | 41.9 |
| *Proc.. food sectors average* | *25.5* | *14.9* | *29.0* | *16.3* | *4.4* | *55.2* | *23.2* | *9.8* | *42.0* |

Notes: For Canada, Mexico and the U.S., tariffs on inter-NAFTA trade are not reflected in this table.
Average tariffs are trade weighted averages.

Source: GTAP database.

**Table 2. Impacts of reducing farm and food tariffs by 30 percent**

| | Canada | USA | Mexico | Rest of Americas | Australia N. Zealand | Japan | Rest of Asia | European Union | Rest of World |
|---|---|---|---|---|---|---|---|---|---|
| Market price, percent | | | | | | | | | |
| Farm | 1.15 | 0.59 | 0.04 | 0.96 | 1.67 | -1.87 | -0.51 | -0.43 | -0.98 |
| Food | 0.11 | 0.11 | 0.01 | 0.53 | 0.96 | -2.68 | -1.08 | -0.45 | -1.37 |
| Supply, percent | | | | | | | | | |
| Farm | 1.01 | 0.52 | 0.01 | 0.68 | 2.06 | -2.66 | -0.17 | -0.71 | -0.91 |
| Food | -1.20 | -0.06 | -0.16 | 0.91 | 3.80 | -1.84 | 1.06 | -0.95 | -0.87 |
| Trade balance, $US million | | | | | | | | | |
| Farm | 492 | 1,356 | 8 | 631 | 37 | -682 | -1,320 | -532 | -1,015 |
| Food | -150 | 167 | -27 | 2,039 | 1,434 | -2,958 | 2,157 | -3,353 | -779 |
| Primary factor returns, percent | | | | | | | | | |
| Farm | 2.23 | 2.16 | 0.07 | 1.28 | 2.82 | -2.17 | -0.52 | -0.89 | -1.09 |
| All Other | 0.02 | 0.00 | -0.02 | 0.41 | 0.56 | -0.07 | 0.13 | -0.09 | 0.06 |

Trade balance is value of exports less value of imports.

**Table 3. Impacts of reducing farm tariffs and the degree of tariff escalation by 30 percent**

| | Canada | USA | Mexico | Rest of Americas | Australia N. Zealand | Japan | Rest of Asia | European Union | Rest of World |
|---|---|---|---|---|---|---|---|---|---|
| Tariff reductions, percent | | | | | | | | | |
| Farm | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Food | 49 | 32 | 45 | 39 | 42 | 30 | 30 | 42 | 34 |
| Price, percent | | | | | | | | | |
| Farm | 1.09 | 0.63 | 0.03 | 1.14 | 2.15 | -1.86 | -0.45 | -0.60 | -0.93 |
| Food | -0.01 | 0.11 | -0.03 | 0.65 | 1.26 | -2.67 | -1.04 | -0.62 | -1.42 |
| Supply, percent | | | | | | | | | |
| Farm | 0.79 | 0.55 | -0.01 | 0.78 | 2.59 | -2.63 | -0.15 | -1.06 | -0.86 |
| Food | -1.73 | -0.02 | -0.21 | 1.27 | 5.27 | -1.81 | 1.27 | -1.69 | -0.62 |
| Trade balance, $US million | | | | | | | | | |
| Farm | 523 | 1,376 | 18 | 489 | -58 | -687 | -1,368 | -176 | -1,128 |
| Food | -189 | 325 | -42 | 2,784 | 1,985 | -2,910 | 2,689 | -6,441 | -7 |
| Primary factor returns, percent | | | | | | | | | |
| Farm | 2.15 | 2.27 | 0.05 | 1.52 | 3.61 | -2.16 | -0.44 | -1.28 | -0.99 |
| All Other | 0.01 | 0.00 | -0.01 | 0.51 | 0.75 | -0.08 | 0.14 | -0.13 | 0.10 |

Trade balance is value of exports less value of imports.

**Table 4. Impacts of reducing farm tariffs by 30 percent and eliminating tariff escalation**

| | Canada | USA | Mexico | Rest of Americas | Australia N. Zealand | Japan | Rest of Asia | European Union | Rest of World |
|---|---|---|---|---|---|---|---|---|---|
| Price, percent | | | | | | | | | |
| Farm | 0.80 | 0.73 | 0.01 | 1.71 | 3.82 | -1.82 | -0.27 | -1.04 | -0.72 |
| Food | -0.47 | 0.14 | -0.11 | 1.01 | 2.32 | -2.64 | -0.94 | -1.09 | -1.51 |
| Supply, percent | | | | | | | | | |
| Farm | -0.19 | 0.65 | -0.07 | 1.09 | 4.36 | -2.54 | -0.08 | -2.01 | -0.64 |
| Food | -3.85 | 0.12 | -0.34 | 2.28 | 10.17 | -1.74 | 1.80 | -3.63 | 0.28 |
| Trade balance, $US million | | | | | | | | | |
| Farm | 648 | 1,437 | 51 | 98 | -372 | -700 | -1,461 | 798 | -1,477 |
| Food | -609 | 920 | -92 | 4,923 | 3,843 | -2,771 | 4,064 | -15,440 | 2,378 |
| Returns to primary factors, percent | | | | | | | | | |
| Farm | 1.76 | 2.64 | 0.03 | 2.24 | 6.39 | -2.11 | -0.21 | -2.28 | -0.59 |
| All Other | -0.05 | 0.00 | -0.00 | 0.82 | 1.39 | -0.09 | 0.14 | -0.26 | 0.21 |

Trade balance is value of exports less value of imports.