

**EU support of its processing tomato industry and the  
competitive consequences for California**

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**Abstract:**

For processing tomatoes, many countries apply import barriers, but the European Union is the main producer that uses export and production subsidies. This article models and measures the impacts on global markets and on the California industry of potential reductions of import barriers and subsidies established for the processing tomato industry in the European Union. A multi-equation simulation model shows that reducing by 50 percent the trade barriers in Europe and elsewhere (including the United States) would raise the California market price for tomatoes by about 6 percent, improve net returns to California processing tomato producers by \$34 million per year and improve net returns to California tomato processors by \$19 million per year. We also find that a 50 percent reduction in EU domestic support would improve net returns of California producers and processors together by about \$8.5 million per year. Thus, negotiating reductions in subsidies, and especially in global trade barriers, makes economic sense for the California processing tomato industry.

## **EU support of its processing tomato industry and the competitive consequences for California**

California produces 95 percent of U.S. processing tomatoes, and the processing tomato industry is a major part of California agriculture. Total revenue was \$670 million in 2004, ranking eleventh among all crops and second among vegetable crops in California (USDA). Processed tomato products are also a major export commodity. About \$250 million of processed tomato products were exported in 2004 accounting for approximately 12 percent of the crop. The industry ranked eighth among California agricultural commodities in value of exports (Bervejillo and Sumner 2005).

The United States and the European Union (EU) each supply approximately one-third of the world's processing tomatoes (Figure 1). There is little or no direct subsidy for processing tomatoes in the United States, however, processing tomato production is directly subsidized in the EU with payments to growers. The EU subsidy regime for processing tomatoes is a part of their overall system of subsidy that applies also to other fruit and vegetable industries.

This article investigates the consequences of EU processing tomato subsidies and global trade barriers for tomato producers and processors, especially in California. We show quantitatively through a simulation model how removal of EU production subsidies reduces EU production and exports, and raises prices in the global market. We show that trade barriers have even larger effects.

The current Doha Round of trade negotiations under the World Trade Organization (WTO) is attempting to reduce subsidies, lower import barriers, and eliminate export subsidies on a global basis. The framework for the ongoing agricultural negotiations suggests that eliminating export subsidies and a 50 percent cut in both tariffs and domestic support for

agricultural commodities may be a plausible outcome (WTO 2004). Our analysis shows what the California processing tomato industry may expect if these negotiations are successful in reducing EU subsidy and protection.

### **An overview of support for the processing tomato industry in the EU**

The EU policy for processing tomatoes includes direct payments tied to production of processing tomatoes, import tariffs, and an export subsidy. Each of these can be described in broad outline here.

From 1978 to 2000, EU domestic support included a complex array of direct transfers to processors (processor aid), minimum prices for growers, and a quota that set a limit on the quantity eligible for the processor aid and the minimum price. In 2000, processor aid was approximately 163 euros<sup>1</sup> per ton of tomato paste, the minimum price for processing tomatoes was 80 euros per ton, and the minimum price was applied to approximately 7.7 million tons of processing tomatoes. This subsidy program was changed beginning with the 2001 crop, and the changes have been shown to further stimulate EU production (Rickard 2003). Since February 2001, EU growers have received 31.31 euros per ton (or 34.50 euros per metric ton) of processing tomatoes from the EU, so long as total EU production does not exceed the threshold limit of 9.1 million tons (or 8.25 million metric tons). The typical market price in the EU is about 45 euro per metric ton, or 40.8 euro per ton, and therefore the subsidy rate is approximately 43 percent of per unit revenue.

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<sup>1</sup> The U.S. Dollar-Euro exchange rate has varied recently. In June 2001, \$1 was equivalent to €1.17, and in January 2006, \$1 was equivalent to €0.82.

Since 2001, the EU tariff has been set at 14.4 percent for processed tomato products, down one-fifth since 1995 in accordance with the Uruguay Round GATT deal that is administered by the WTO. This tariff is refunded when the imported product is used in, or offset by, exports of processed tomato products. The EU also allows reduced or zero tariffs for imports from selected developing countries. Export subsidies apply to selected canned tomatoes products that comprise a relatively small share of total processed tomato production in the EU. For reference, the United States applies an import tariff of 12.5 percent for processed tomato products, and the average (non-weighted) tariff in other tomato importing regions is approximately 20 percent.

### **A simulation model for assessing the effects of policy reform for processing tomatoes**

An economic simulation model may be used to assess the effects of lower EU domestic support and reduced border measures in the global processing tomato industry. There are three regions in our model; the EU, the United States, and the rest of the world. The model accommodates five processed products that are less than perfect substitutes in consumption (EU-produced canned tomato products, canned tomato products from other sources, EU-produced paste, U.S. paste, and paste produced in other countries). In each of the three regions, two inputs (raw tomatoes and other inputs) are used in the production of those outputs. There is trade in processed tomato products but not in raw tomatoes. The simulation model is used to perform experiments in policy reform, that is, to examine the effects that alternative policy scenarios would have had, in the processing tomato industry.

We focus on reductions in domestic subsidy, export subsidy and tariffs. The EU has the world's only significant program of domestic subsidy for processing tomatoes, but many

countries have import tariffs, including the United States. It is implausible that import tariffs in the EU would fall unilaterally; therefore we consider multilateral reductions in import tariffs across all tomato-producing regions combined with reductions in EU export subsidies and EU domestic support.

The simulation model requires a set of equations to describe the supply, demand, and market clearing conditions for a given market. Equilibrium adjustments can be simulated by exogenously specifying changes in the policy parameters, such as changes to EU domestic support or tariff rates. The model is used to simulate proportional changes in prices and quantities (and ultimately benefits or costs to producers and processors) for selected input and output markets in the processing tomato industry.

The proportional changes in prices and quantities are functions of various elasticity<sup>2</sup> and share parameters. The price elasticities of demand for the five processed tomato products were calculated from an overall price elasticity of demand for all processed tomato products, an elasticity of substitution between processed products, and consumption shares (Armington 1969). The overall elasticity was set to  $-0.5$ , and based on estimates from George and King (1971) and Huang (1985). The elasticity of product substitution was set to  $5.0$  reflecting the fact that tomato products are relatively close substitutes. The consumption shares were based on per-capita consumption rates for processed tomato products (USDA). The price elasticity of supply for processing tomatoes was assumed to be relatively inelastic and set to  $0.5$ , based on an estimate from Chern and Just (1978). The price elasticity of the manufacturing input supply was set to  $1.0$ . The cost share for processing tomatoes was set to 45 percent for tomato paste and 20

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<sup>2</sup> Elasticities are used to represent the ratio between proportional change in one variable and proportional change in another.

percent for canned tomato products (based on estimates from a survey of industry experts). We allow for some substitution between processing tomatoes and the manufacturing input, and this parameter was set to 0.1 (a value of 0 would indicate no input substitution and for perfect substitutes the elasticity would be infinite). The simulation model includes raw tomatoes and processed tomato products, and we use a conversion rate of 6.1 tons of tomatoes per ton of tomato paste and 1.2 tons of tomatoes per ton of canned tomato products. Effects of alternative values of several of these parameters, especially supply and demand elasticities, were also examined to test sensitivity in Rickard (2003) and Rickard and Sumner (2005). Our results are robust to changes in key parameters across a plausible range, and the main results for the most likely parameter values are reported here.

### **Effects of policy reform**

Simulation results describe how changes in EU export subsidies, global tariffs, and EU domestic support policy would affect prices, quantities, and net benefit measures (*e.g.*, revenues and government expenditures). Here the focus is on the effects in the EU and, especially, California.

First consider the export subsidy. Complete elimination of the export subsidy would lower EU export tonnage by only 0.6 percent. The small impact of the export subsidy reform is mostly attributed to the fact that the export subsidy rate is low and applies to a small portion of total EU production. Since the impact of the EU export subsidy on the California industry is so small, we focus the rest of our analysis on the effects of reductions in import tariffs and EU domestic support.

Table 1 presents simulation results on prices and quantities for three alternative scenarios. Column 1, labeled “Import Tariffs” shows how tariff reduction worldwide would affect prices

and quantities in the EU and the United States. A 50 percent cut in tariffs, consistent with current proposals in the Doha Round of negotiations (WTO 2004), would increase the price and quantity produced in the EU and the United States because both would export more to third markets, which begin with higher tariff rates. The price and quantity of processor-supplied inputs would also rise.

Column 2 shows the effects of cutting the EU production subsidy by 50 percent. In this scenario per unit grower returns in the EU fall and market prices for tomatoes paid by EU processors rise by 12.2 percent. The result is a decline in the quantity of tomatoes used and a decline in processor supplied inputs as well. Cutting EU domestic support by this magnitude, has positive effects in the United States.

The final column, “Import Tariffs and EU Domestic Support”, examines the effects of cutting EU production subsidies together with tariffs in all countries. The result is an increase in the price paid for tomatoes in the EU and a decrease in the price received by growers in the EU. Reducing tariffs and subsidies together would raise prices and quantities in the United States.

The changes in prices and quantities from Table 1 are used to calculate changes in net producer revenues, net government expenditures or tariff revenue, and consumer benefits from tomato consumption in Table 2. The first two rows in Table 2 show the effects on annual net benefits to producers and processors in the United States. The benefits from cutting domestic subsidy in the EU are \$5.5 million per year for growers and \$3.0 million per year for processors. The reduction in tariffs on a global basis would have a significantly larger effect on tomato producers and processors in the United States. The benefit to U.S. producers of tomatoes is approximately \$34 million per year with about \$32 million per year of that for growers in California. The increase in benefits to U.S. processors is approximately \$19 million per year

with almost all of that again benefiting processors in California. Benefits to tomato producers and processors total \$53.5 million per year. Part of this net revenue increase comes from U.S. markets and part from additional export revenue. The cost to U.S. consumers from higher prices for U.S. tomato products is about \$20 million. The United States also loses \$2.4 million in tariff revenue, so the net gain for the United States is about \$31 million per year.

## **Implications**

Farmers and processors in the United States would benefit from reductions in import tariffs than reductions in EU domestic support even though that would also mean reductions in the U.S. tariff. We note, however, that reductions in import tariffs would place pressure on the EU domestic support regime. Reducing import tariffs would increase production of tomatoes in the EU, and thereby increase the taxpayer cost of the EU domestic support regime. This would place additional pressure on EU budgets that may lead to reductions in subsidies as a response.

Producers and processors in the United States gain about \$8.5 million annually from a reduction in the EU subsidies and the gain from tariff elimination is even larger. This result of the simulations may be surprising to some because the initial tariff is only 14.4 percent while the subsidy is 43 percent. The relative magnitude of the two impacts is driven by three factors. First, the supply response of processing tomatoes in the EU to lower per acre returns (including policy benefits) is relatively inelastic over the intermediate time horizon because, for this analysis in the context of trade negotiations, we envision reduction in support for processing tomatoes as part of a larger multi-commodity package. Second, EU domestic support applies to the farm-produced product, and import tariffs apply to processed products. The farm product represents only 45 percent of the cost of tomato paste and 20 percent of the cost of canned

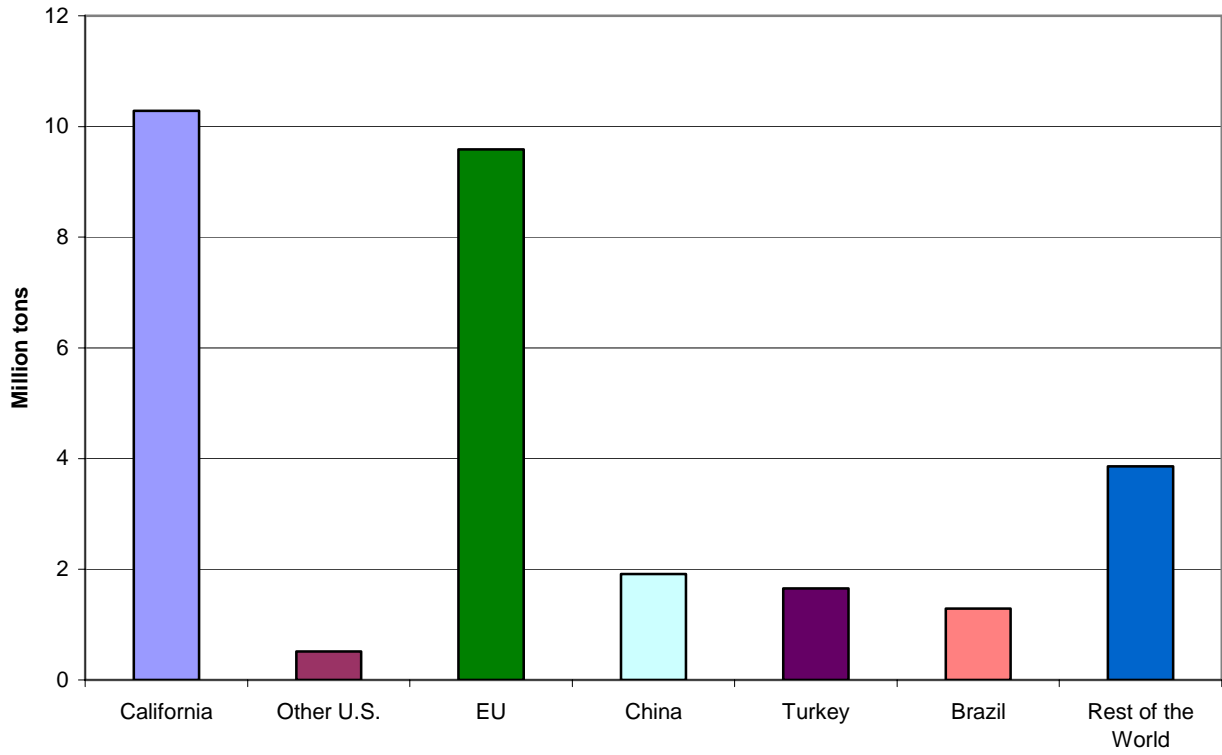


tomato products, and barriers that apply at the border have bigger effects on trade than subsidies on raw materials that are inputs to the tradable product. Third, the EU domestic support program drives a wedge between the price the growers receive, and the price the processors pay, for tomatoes. Reducing EU domestic support would reduce that wedge, and the burden of any reduction is shared between the grower and processor.

### **Conclusion**

Trade negotiations have the potential to reduce trade barriers and farm subsidies on a global basis. The California processing tomato industry has long been concerned with subsidies and import barriers in the EU. Our research shows that this interest is well placed, and, while the effects of domestic subsidies are significant, to increase net returns, negotiation emphasis should be on trade barriers more than on domestic subsidies in Europe. We also show that the California processing tomato industry would receive considerable benefits from global tariff reduction, even though that would mean giving up some of its own protection from imports.

**Figure 1: Average processing tomato production in selected countries from 1999 to 2003**



Source: World Processing Tomato Congress: Production Table. <http://www.wptc.to>

**Table 1: Simulated effects of policy changes on prices and quantities**

<b>Variables</b>	<i>A 50 Percent Reduction in:</i>		
	Import Tariffs	EU Domestic Support	Import Tariffs and EU Domestic Support
	<i>Percent Change</i>		
EU Grower Price – <i>Tomatoes</i>	1.4	-9.3	-7.9
EU Processor Price – <i>Tomatoes</i>	1.4	12.2	13.6
EU Quantity – <i>Tomatoes</i>	0.7	-4.6	-3.9
EU Price – <i>Processor Inputs</i>	0.8	-3.1	-2.3
EU Quantity – <i>Processor Inputs</i>	0.8	-3.1	-2.3
U.S Price – <i>Tomatoes</i>	6.2	1.0	7.2
U.S. Quantity – <i>Tomatoes</i>	3.1	0.5	3.6
U.S. Price – <i>Processor Inputs</i>	3.4	0.5	3.9
U.S. Quantity – <i>Processor Inputs</i>	3.4	0.5	3.9

**Table 2: Simulated welfare effects of policy changes in the U.S. processing tomato industry\***

<b>Benefit or Cost to:</b>	<i>A 50 Percent Reduction in:</i>		
	Import Tariffs	EU Domestic Support	Import Tariffs and EU Domestic Support
	<i>Change in million \$US</i>		
U.S. Tomato Producers†	34.6	5.5	40.3
U.S. Tomato Processors	18.9	3.0	22.0
U.S. Government Budget (Tariff Revenue)	-2.4	-1.6	-3.2
U.S. Consumers of Processed Tomato Products	-19.8	-6.2	-24.6
<b>Total U.S. Economy</b>	<b>31.3</b>	<b>0.6</b>	<b>34.5</b>

\* Effects for the EU and the rest of the world are available from the authors.

† California growers would earn more than 90 percent of the benefits. The gain of \$34.6 million represents 6.4 percent of total producer revenue and a significantly larger percent of net revenue.

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