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## Commodity Profile: Processing Tomatoes

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### Overview

The U.S. tomato processing industry, comprised primarily of tomato pastes, sauces and canned tomato products, is distinctly separate from the fresh-market industry. Specific characteristic differences separate tomatoes entering the two markets; fresh market varieties are juicier and harvested when immature, while processing varieties contain higher percentages of soluble solids, are vine-ripened, and have a thicker skin than fresh market tomatoes to survive mechanical harvesting and bulk transport. The marketing methods of the two industry segments differ as well. The majority of fresh tomatoes are handpicked and sold on the open market, while all processed tomatoes are mechanically harvested and sold under contract. Although the harvest tonnage of processing tomatoes is 5-6 times larger than that of fresh tomatoes, the low market value for processing tomatoes in terms of dollars per pound make fresh market tomatoes responsible for a larger share of U.S. total crop value than processed tomatoes.

Processing tomato products are most often classified as one of four major subcategories: tomato paste, tomato sauces, ketchup, and other products which mainly consist of puree, whole canned tomatoes, and juices.

### Market Structure

Nearly 100 percent of processing tomatoes are produced and sold under contract between growers and processing firms. Firms that contract for processing tomatoes are typically manufacturers of raw tomato paste. This paste is eventually used to make sauces, ketchup, etc., and can be stored for up to 18 months (Economic Research Service (ERS) 2005). Processing tomatoes harvested from the field are transported to the manufacturing plant and transformed into paste within 6 hours after harvest. The small window between harvest and conversion into tomato paste necessitates a manufacturing industry in close proximity to farm production areas. The raw paste is eventually sold to remanufacturing companies which add water, spices, flavorings, and other additives to make specialized retail products such as sauces and ketchup. In the past, a single manufacturer often produced both bulk paste and retail products. However, in more recent years the

processing industry has begun to specialize either in manufacturing bulk tomato paste or producing retail products (ERS 2005).

### **Demand**

U.S. consumption of processing tomato products has been on the rise over the past two decades. For the processing industry, much of the increased consumption is attributable to the increased presence of tomato products used in popular food items and condiments such as pizzas, pastas, salsa, and ketchup.

U.S. per capita consumption of processing tomatoes was 70.4 pounds in 2004, which is less than the peak value of 77.1 seen in 1991 (Figure 1). According to an ERS consumption pattern study (2000), increased consumption of processing tomato products in the 1990s was primarily due to increasing popularity of ketchup and Mexican and Italian meals away from home. Nevertheless, the majority of tomato products consumed are originally purchased at retail stores and consumed at home.

Another factor often attributed to increasing the demand of processing tomato product is the promotion of tomatoes for their nutritious value. Tomatoes have been advertised as a good source of vitamin A and Vitamin C as well as a source of the antioxidant lycopene which, as some research suggests, aids in the prevention of specific digestive tract cancers (La Vecchia and California Tomato Commission).

### **Exports**

The United States has been a net exporter of processed tomato products since 1991. In 2004, the value of U.S. exports amounted to \$270.2 million, while imports were valued at \$129 million. Aside from being the world's largest producer, the United States is also one of the top-five exporting nations. Other important exporting nations include those of the European Union, China, Turkey, and Chile, which all compete with the United States for a share of the global market for processed tomato products.

U.S. processed tomato exports consist mainly of tomato paste and sauces which accounted for almost 80 percent of U.S. total export value in 2004 (Figure 2). Both Canada and Mexico have been, and remain large export markets for U.S. processed tomatoes and tomato products (Figure 3). Canada accounted for roughly half (\$134.7 million) of the \$270.2 million in total U.S. processed tomato exports shipped in 2004. Mexico was the second largest export market accounting for \$38.5 million in U.S. exports followed by Japan with \$20 million.

Canadian tariffs on tomato products reached zero in 1998 as a result of the Canadian U.S. Free Trade Agreement (CUSTA) 10 year phase-out of bilateral tariffs on tomato products. Since 1989, the year following CUSTA, imports increased significantly from just over \$12 million to \$135 million in 2004 (Figure 3). In 2004, the major processed tomato exports to Canada were sauces (53%), and paste (26%).

Under the 1994 North American Free Trade Agreement (NAFTA), by 2003 tariffs were also eliminated between the United States and Mexico. U.S. exports of processed

tomato goods to Mexico have increased since NAFTA, due in part, to the rapidly growing fast food industry in Mexico (Economic Research Service, USDA). However, in 1995, U.S. exports to Mexico decreased for all processed tomatoes as a result of contracted consumer demand in Mexico following the 1994 peso devaluation (Figure 3). Exports of pastes to Mexico doubled between 2002 and 2003, from nearly \$9 million worth to just over \$18 million. In 2004 the major exported products to Mexico were pastes and sauces.

### **Supply**

The total value of U.S. processing tomatoes was \$719 million in 2004, making processing tomatoes the leading vegetable used for processing, in terms of value. California has been the leading state in production of processing tomatoes in the United States, accounting for 93 percent of total U.S. harvested acreage in 2004. California processing tomato acreage is concentrated mainly in the Sacramento Valley counties of Yolo and Solano. Other states growing tomatoes for processing were Indiana, Ohio and Michigan.

Despite a relatively constant number of acres planted over the last 45 years, total production of processing tomatoes has been increasing. Average U.S. acreage in the 1980 was 263,000 acres and by 2004 acreage had increased by 15 percent to 301,600 acres. The value of production, however, increased by nearly 100 percent over the same period of time (Figure 4). Much of the increase in production is due to improved harvest technologies and improved genetic varieties, which have led to a steady increase of yields over time. In 1980, yields were 23.6 tons per acre and by 2004 yields had increased to 40.8 tons per acre (Figure 5). From year-to-year, however, yields can be variable. Extended periods of rain can disrupt planting schedules, affecting yields and overall production. Wet weather also creates favorable conditions for diseases such as bacterial speck and late blight, which can severely damage tomato crops.

When adjusted for inflation in 2000 dollars, average prices for U.S. processing tomatoes have decreased steadily over time from \$136.4 per ton in 1979 to \$54.2 in 2004 (Figure 6). Processing tomato farm prices peaked slightly in 1999 at \$72.7 per ton, triggered by a shortened crop from bad weather the preceding year coupled with a strong consumer demand. In recent years (2000-04) price have averaged \$58.9 per ton.

### **Imports**

The total value of U.S. processing tomato imports has been increasing after a drop in imports in 2000. In 2004 the United States imported \$129 million worth of canned tomato products including paste, sauce, and ketchup – an 18 percent increase from the previous year. In value terms, the most important product imported was tomato sauce, which increased by nearly 330 percent between 2000 and 2002. Imports of ketchup increased by 46 percent between 2003 and 2004. Combined these products were the leading import in 2004 followed by pastes and purees (Figure 7).

In 2004 U.S. processing tomato product imports from Canada totaled nearly \$60 million, followed by Italian imports of \$43.4 million, and Mexican imports of \$12.6 million. In 2004, Canada supplied 46 percent of total U.S. imports and accounted for 98

percent of U.S. ketchup imports. In recent years, Italy has accounted for the majority of U.S. imports of tomato sauce, while Mexico supplied the majority of imported tomato pastes.

### **Sources**

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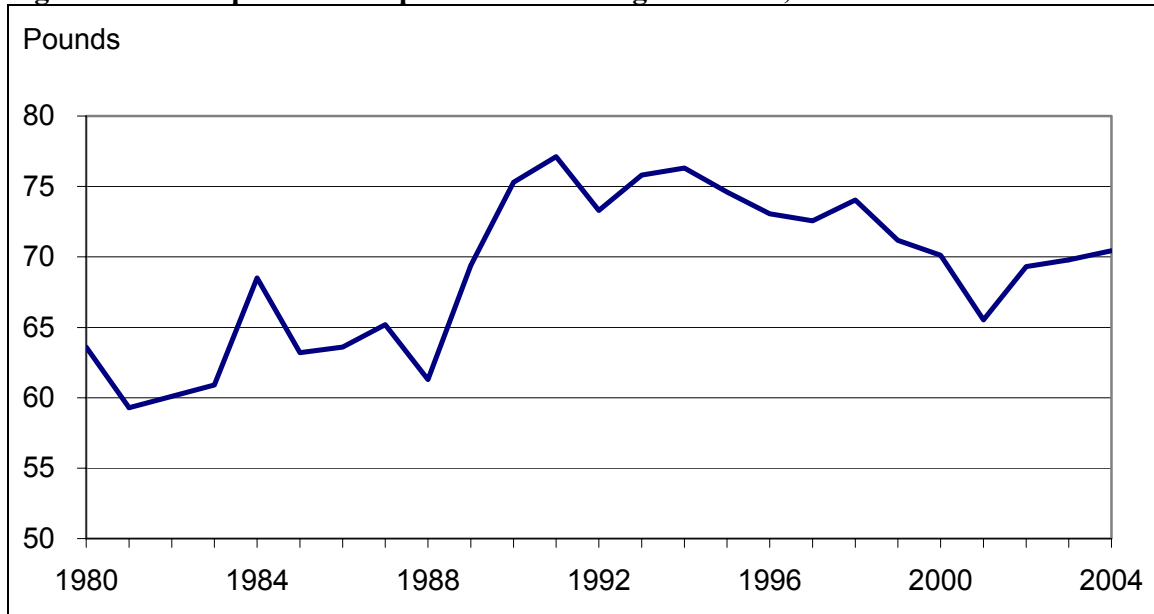
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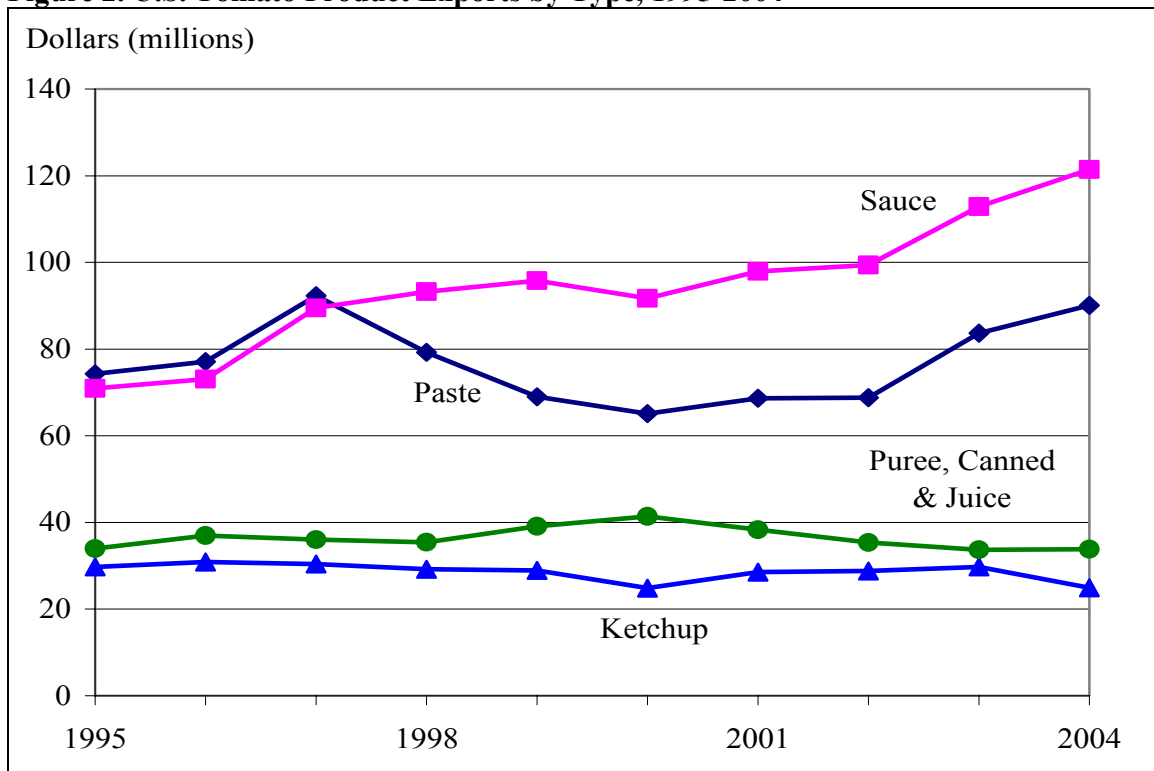
**FIGURES**

**Figure 1. Per Capita Consumption of Processing Tomatoes, 1980-2004**



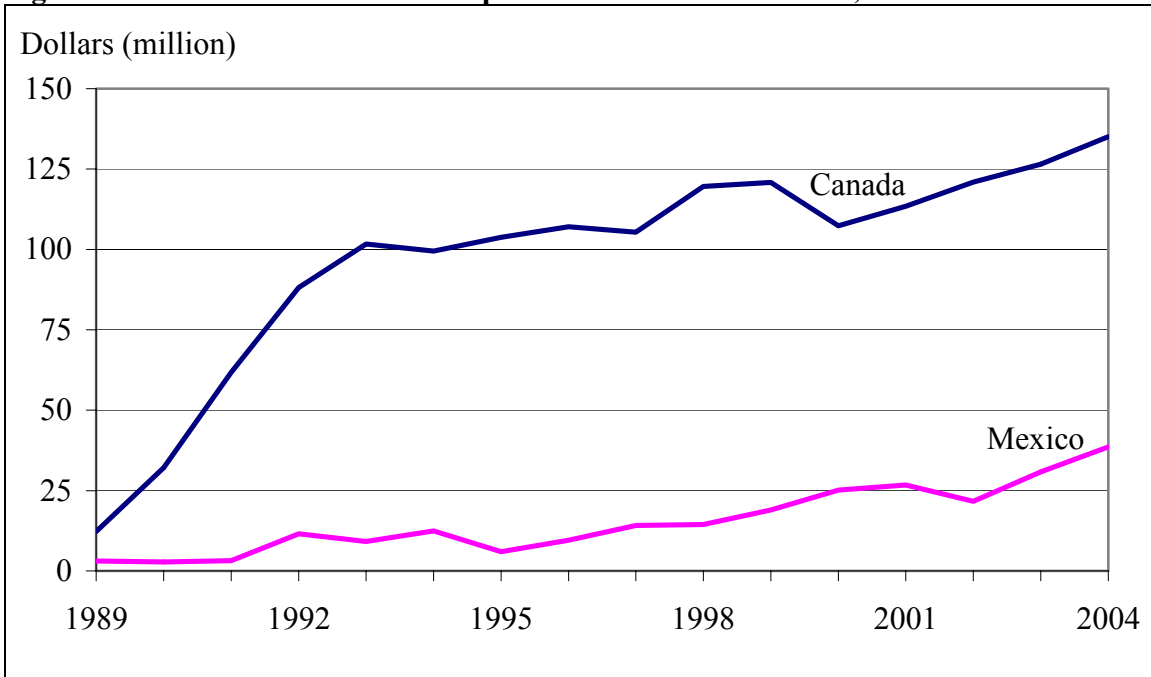
Source: USDA Economic Research Service, *Vegetables and Melons Yearbook*

**Figure 2. U.S. Tomato Product Exports by Type, 1995-2004**



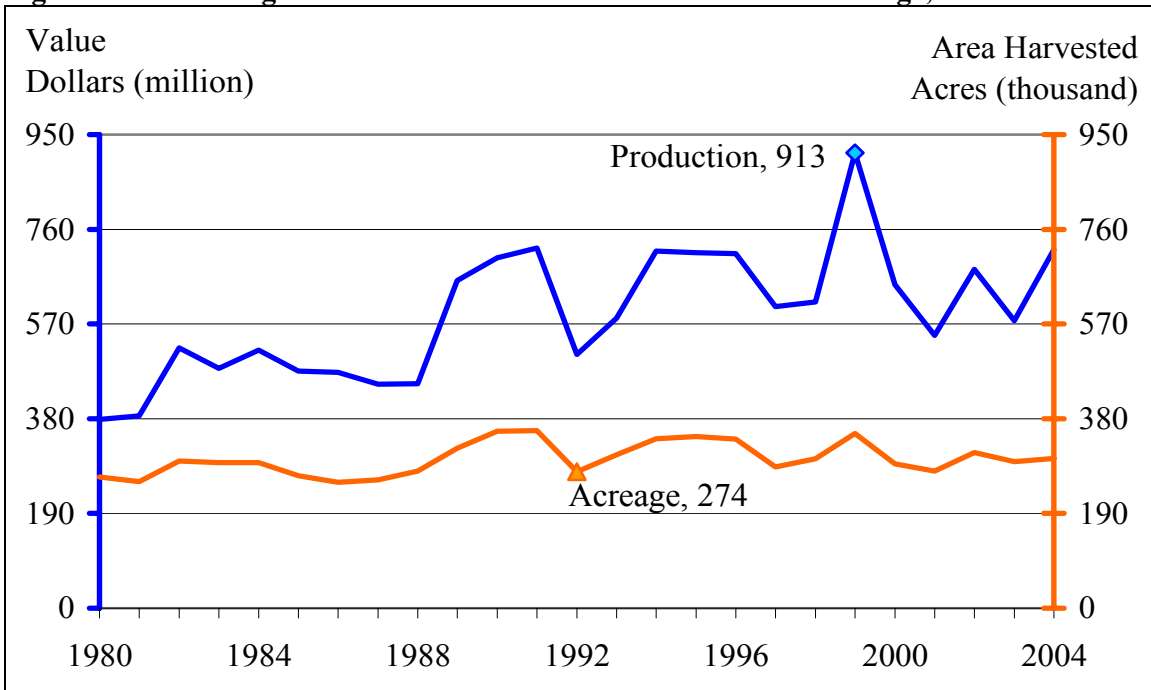
Source: USDA Economic Research Service, *Briefing Room; Tomatoes Trade*

**Figure 3. U.S. Processed Tomato Exports to Canada and Mexico, 1989-2004**



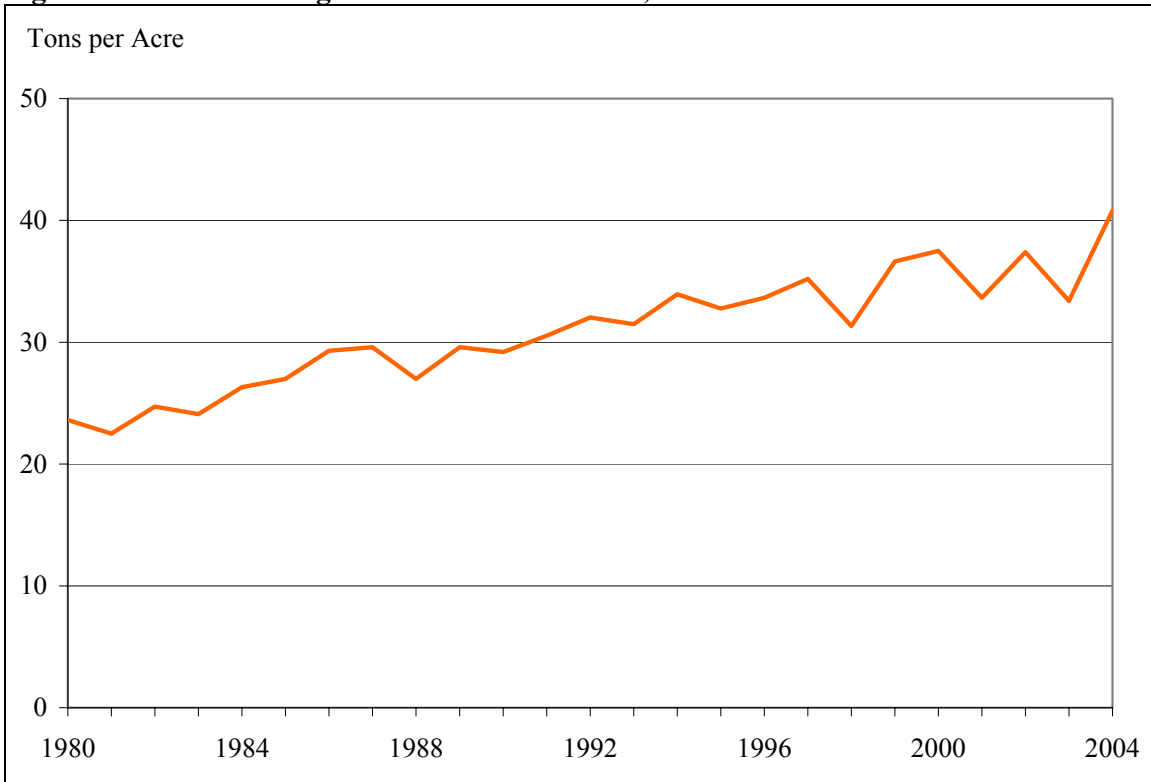
Source: USDA Foreign Agricultural Service

**Figure 4. Processing Tomato Production Value vs. Harvested Acreage, 1980-2004**



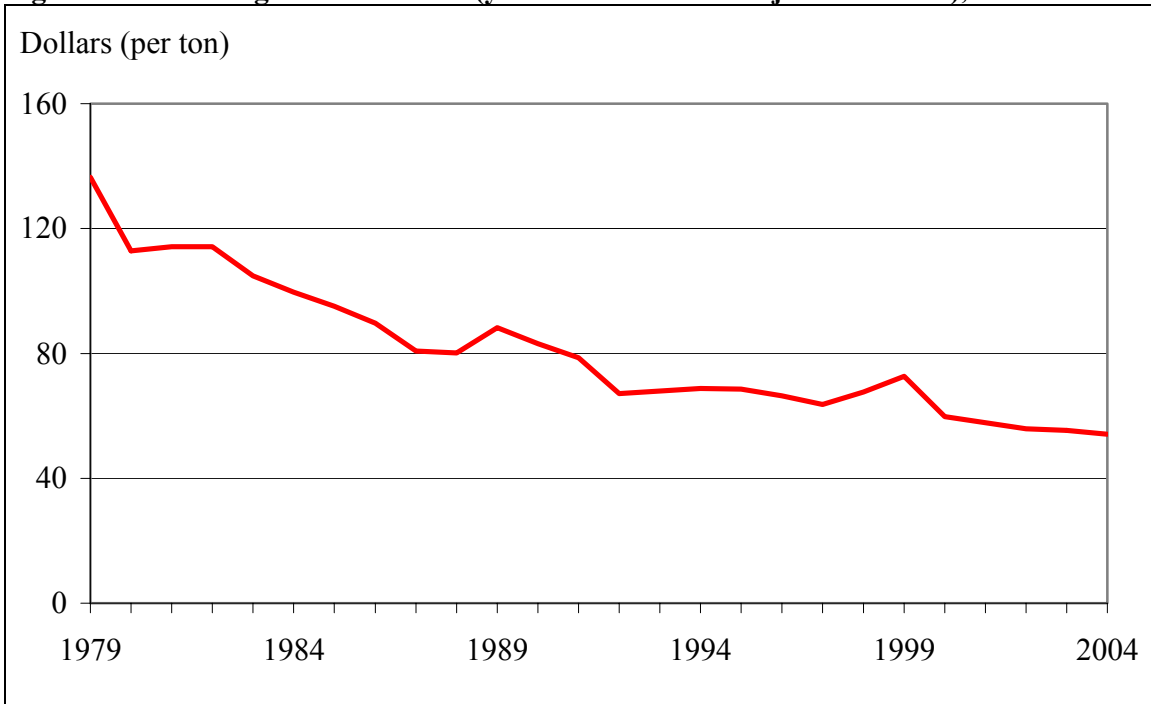
Source: USDA Economic Research Service, Vegetables and Melons Yearbook

**Figure 5. U.S Processing Tomato Yield Per Acre, 1980-2004**



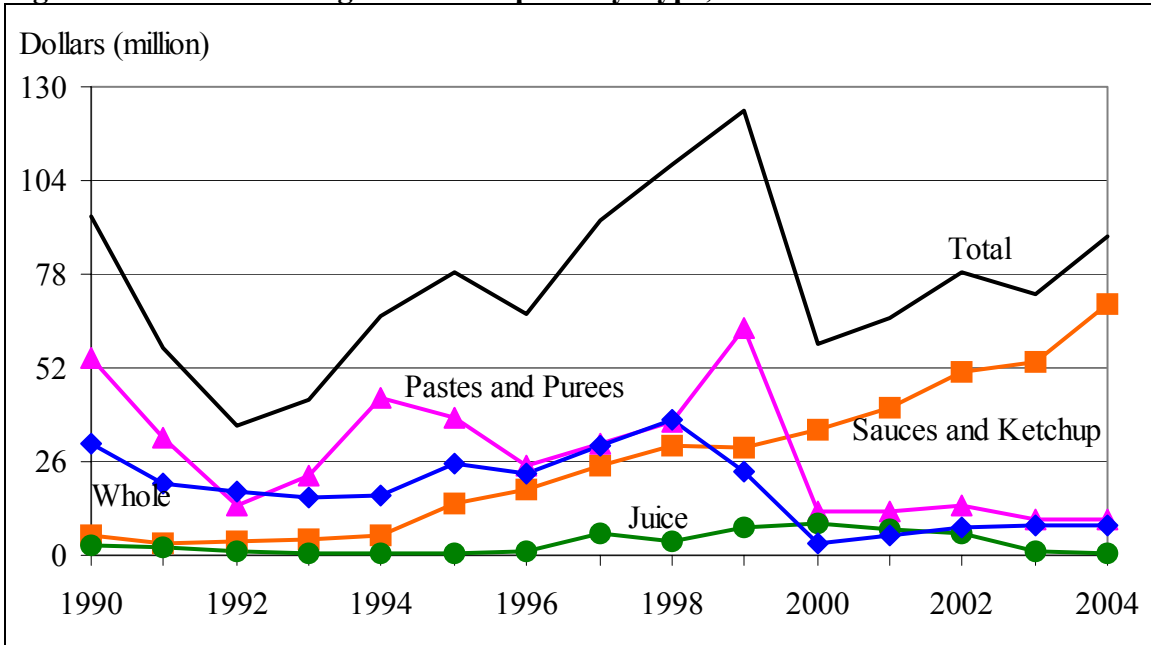
Source: USDA Economic Research Service, *Vegetables and Melons Yearbook*

**Figure 6. Processing Tomato Prices (year 2000 inflation-adjusted dollars), 1992-2004**



Source: USDA Economic Research Service, *Vegetables and Melons Yearbook*

**Figure 7. U.S. Processing Tomato Imports by Type, 1990-2004**



Source: United States International Trade Commission Data