Industry Initiated Regulation and Food Safety: the New Federal Marketing Order for Pistachios

by

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The new California pistachio marketing order, designed to reduce risks of food safety problems and enhance demand, will likely increase net benefits for the industry and the nation.

On August 1, 2005 a new federal marketing order began regulating domestic marketing for California pistachios. The new regulations derived from the efforts of a group of California growers initiated to address concerns about food safety and consistent quality. The main provisions of the marketing order require the testing for aflatoxin, a cancer-causing mold found in many nuts and grains, and set some minimum quality standards.

The path to the new marketing order was long and complex. After about two years of preparation, in July 2002, a federal hearing was held under USDA oversight in Fresno. Industry proponents argued that the marketing order would increase consumer confidence and reduce the chance of an aflatoxin event in the pistachio market, and thereby stimulate demand and enhance consumer benefits and producer returns. The proposal was supported by a 90-percent majority of growers voting and also representing over 90 percent of the quantity produced in a January 2004 referendum.

This article, based on our Giannini monograph, investigates quantitatively the likely costs and benefits of the introduction of the marketing order for producers and consumers of pistachios. The full study identifies the costs of complying with marketing order specifications and weighs those costs against the benefits from increased demand for California pistachios under several alternative scenarios. See the full study for more details and references on all the issues discussed here in abbreviated form.

Here we present brief background information on the California pistachio industry and the specifications of the marketing order, before turning to the economic rationale behind collective action as a remedy for the perceived food safety and quality concerns in the industry. Finally we present a summary of our cost-benefit analysis.

Background on the California Pistachio Industry

Pistachio production in California has grown more than 200-fold since 1976, when the first commercial crop of 1.5 million pounds was harvested. In 2004, California pistachio production reached a new record of 347 million pounds valued at nearly $440 million. Table 1 presents time-series data on the industry. The longer-term trends have shown steadily growing acreage, yields, quantity, and value of production, and a downward trend in prices. Fluctuations around those trends reflect, in part, the alternate-bearing nature of the crop and the impact of supply fluctuation on price.

It takes a pistachio tree 12-15 years to reach full potential. Bearing acreage in 2004 was estimated to be 93,000 acres, up more than three-fold from 25,773 bearing acres in 1980. The growth in area and production is expected to continue, with non-bearing acreage having reached 23,500 acres in 2001 (The industry no longer reports nonbearing acreage, but informal estimates indicated roughly constant nonbearing acreage in recent years). Falling returns per pound reflect the fact that supply has been growing faster than demand.

According to the Californian Pistachio Commission, California had approximately 650 pistachio producers

Table 1. Data on California Pistachio Area, Production, Yield and Value: 1980-2004

Year	Bearing	Non-Bearing	Production	Yield	Value	Average Return
	-----(acres)-----		(mil lbs)	(lbs/acre)	(mil $)	($/lbs)
1980	25,773	8,989	27.2	1,055	55.8	2.05
1990	53,700	11,100	117.3	2,375	129.6	1.02
2000	74,578	21,730	241.6	3,239	239.2	1.01
2001	78,000	23,500	160.3	2,055	166.7	1.01
2002	83,000	*	302.4	3,644	332.6	1.10
2003	88,000	*	118.0	1,341	144.0	1.22
2004	93,000	*	346.8	3,729	437.0	1.26

Source: California Pistachio Commission
*Note: * Due to inconsistent capture of new plantings, summary data is not reliable.*

in 2002. There is one pistachio producer cooperative and 19 private handlers who process pistachios. About 70 percent of California pistachio producers produce less than 100,000 pounds per year, while about nine percent of growers produce more than 500,000 pounds per year. The largest handler (who is also a large grower) processes about 50 percent of industry production.

World production of pistachios has also grown rapidly during the past 20 years, but U.S. production has increased as a share of the world total (California production comprises 98 percent of U.S. commercial production). Iran produces about 57 percent of world supply (2001-2003 average), followed by the United States with 21 percent. Iranian exports account for 64 percent of world exports (2001-2003) again followed by the United States with 10 percent. The EU is the world's main pistachio import market, accounting for 38 percent of imports during the 2001-2003 period.

Specifications of the Marketing Order for Pistachios

The order sets standards for pistachios produced and handled in California by establishing maximum aflatoxin tolerance levels and mandatory aflatoxin testing and certification. In addition, the order establishes maximum limits for defects and minimum size requirements. External defects are defined as any abnormal condition affecting the hard covering around the kernel. Internal defects include any damage affecting the appearance of the kernel.

The marketing order will be administered by a 11-member committee, which consists of eight producers, two handlers of pistachios and one public member. An initial assessment rate of $0.0014 per pound was set to cover costs of testing and administration. All specifications of the order apply solely to California pistachios marketed in the United States.

Rationale for Collective Action in Pistachio Markets

Mandated collective action programs, such as the marketing order for California pistachios, use the coercive powers of the federal government to require individual producers and processors to follow order specifications and contribute assessments to fund its operations. Such programs require the support of a large majority of producers, but they do not require unanimous support. Unlike truly voluntary collective action programs, such as cooperatives or clubs, once they have been established, these marketing orders are mandatory for all producers of the commodity in the defined area, even those who may oppose them.

The economic rationale for the use of the government regulatory powers is that there are collective goods within the industry that will be undersupplied otherwise. In some cases, especially for products that are typically unbranded, perceptions of a food quality problem may not be specific to individual suppliers, but affect the industry in a collective way. Therefore, the private incentive to assure high quality nuts that are perceived as safe does not reflect the full, industry-wide or public benefit of these actions. In that case, all farms and firms would benefit from a stronger reputation for pistachios in general, but their own actions cannot assure such a reputation, unless the rest of the industry matches those actions. Individual farms and firms have the private incentive to keep their own direct costs low and invest less in safety testing and quality assurance than would be optimal from the view of the whole market. This is a classic "free-rider" problem where individuals cannot be precluded from sharing in the benefits even if they fail to make contributions, and where one individual benefiting from the better reputation does not preclude benefits to others.

Food-Safety Issues and Aflatoxin in Pistachios

Aflatoxin and the potential risk of experiencing a food scare involving pistachios were the main issues behind the industry-led effort to impose a marketing order for California pistachios upon itself. An event of aflatoxin poisoning in pistachios or the possibility of such an event, could have adverse effects on demand, and the idea of the marketing order is to reduce these potential adverse effects.

Many produce-related food scares have occurred in recent years. For the period from 1990 to 1999, the Center for Science in the Public Interest (CSPI) lists 55 cases in the United States alone. In 1996, the California strawberry industry lost an estimated five percent in total revenue due to the *Cyclospora* scare. The main aflatoxin event directly related to pistachios occurred in Europe. Iranian pistachio imports were banned in the European Union in September 1997 because shipments exceeded allowed levels of aflatoxins. The ban lasted for less than three months. However, the demand for pistachios was affected for a longer period. Aggregate imports into the EU, including those from the United States, the main alternative source, dropped from 102,698 metric tons in 1997 to 59,619 metric tons in 1998.

Table 2. Consequences of the Marketing Order: Simulation Results and Sensitivity Analysis

	Most Likely	High-impact	Low-impact
Induced changes caused by the marketing order	*Average of Annual Values, 2000-2050*		
Bearing area of California pistachios (acres)	1,669	2,502	1,159
Production of California pistachios (Million lbs)	8.62	12.97	5.97
U.S. consumption of CA pistachios (Million lbs)	9.92	14.76	6.87
Exports of California pistachios (Million lbs)	–1.25	–1.73	–0.87
New plantings (acres)	125.7	186.1	91.4
Consequences over 50-year horizon, present values in 2004, millions of 2003 $			
Cost of compliance	32.67	31.49	33.66
Changes in U.S. consumer surplus	115.93	178.73	75.18
Net changes in foreign surplus	–32.57	–48.55	–21.24
Changes in California producer surplus	75.33	115.45	48.20
National benefits (Consumer and producer Surplus)	191.26	294.20	123.38
Benefit–cost ratios over 50-year horizon			
National B/C ratio	5.9	9.3	3.7
Grower share of costs	0.24	0.24	0.24
Grower B/C ratio	9.6	15.2	6.0

Benefit Cost Analysis of the Marketing Order

We developed a detailed dynamic model of pistachio supply and demand and used the model to evaluate the likely costs and benefits of the marketing order looking forward for 50 years from its introduction in 2005. Across the full range of parameters used in our analysis, the benefit-cost analysis was always favorable to the policy: the measured benefits to producers, the nation or the world always well exceeded the corresponding measure of costs, typically by many times. The benefits consist of a higher demand for pistachios following the certification of a high-quality product and thus higher willingness to pay for a certified quality product. Another benefit is derived from the reduced likelihood of an aflatoxin related food scare.

Table 2 reports results for the most likely scenario and for two more scenarios with particularly high and low-parameter assumptions. The resulting benefit-cost ratios were mostly greater than 5:1 and often greater than 10:1, which means there is substantial leeway to accommodate potential errors in assumptions and yet have favorable findings. In present value terms, the benefits to producers were estimated at $75.3 million. Two-thirds of the benefits, $115.9 million would accrue to domestic consumers. These values are large relative to the cost of compliance with the program, which is estimated to be $32.7 million.

Conclusion

Many California commodities have instituted marketing orders or similar programs to achieve objectives ranging from promotion to supply control. The California pistachio industry has just established a marketing order intended to reduce the odds of an adverse food-safety event, to mitigate the consequences if an event should occur, and to provide some quality assurance to buyers. Our modeling of the pistachio market and a resulting benefit-cost analysis indicate strongly that producers and the nation as a whole will experience a net gain from the marketing order.

For additional information, the authors suggest the following publication, on which this article is based:

Gray, R.S., D.A. Sumner, J.M. Alston, H. Brunke, and A. Acquaye, "Economic Impacts of Mandated Grading and Quality Assurance: Ex Ante Analysis of the Federal Marketing Order for California Pistachios," *Giannini Foundation Monograph Series* No. 46, Giannini Foundation of Agricultural Economics, Oakland CA, March 2005. (http://giannini.ucop.edu/Monographs/46_pistachios.pdf)

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