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ORANGE JUICE ADVERTISING BY THE FLORIDA DEPARTMENT OF CITRUS: ESTIMATES OF 2006-07 FLORIDA AND FREE-RIDER BENEFITS

BY

Mark G. Brown – Senior Research Economist - FDOC

FLORIDA DEPARTMENT OF CITRUS
Economic and Market Research Department
P.O. Box 110249
Gainesville, Florida 32611-2049 USA
Phone: 352-392-1874
Fax: 352-392-8634
Email: mgbrown@ufl.edu

www.floridajuice.com

Orange Juice Advertising by the Florida Department of Citrus: Estimates of 2006-07 Florida and Free-Rider Benefits*

Estimates of the benefits from orange juice (OJ) advertising by the Florida Department of Citrus (FDOC) were made using the model discussed in "Generic Promotions of Florida Citrus," (Appendix A), a report prepared by a Panel of Economists appointed by the Florida Citrus Commission, April 2005. The panel was headed by Dr. Ron Ward, Food and Resource Economics Department, University of Florida.

With Florida orange production at a short 129.8 million boxes in 2006-07, Florida OJ production for this season was at the lowest level since the 1991-92 season. Florida OJ production was also low in the preceding two hurricane impacted seasons. With production down over the past several seasons, Florida OJ inventories have declined. These factors, in conjunction with the world OJ supply and demand situation, have supported a relatively high OJ price and resulted in increased U.S. imports of OJ.

The benefits of OJ advertising result from 1) increased gallon sales and 2) higher prices. Advertising was estimated to increase the delivered-in price by $.083 per single strength equivalent (SSE) gallon in 2006-07. The with-advertising and without-advertising delivered-in prices were estimated at $1.981 and $1.898 per SSE gallon, respectively (Table 1). The higher advertising price was estimated to result in an increase in U.S. imports of 57.2 million SSE gallons (347.8 to 405.0 million SSE gallons). The higher price was also estimated to result in a drawdown of Florida OJ inventories of 24.9 million SSE gallons and a reduction of U.S. OJ exports of 8.3 million SSE gallons.

With price constant at the without-advertising level of $1.898 per SSE gallon, it is estimated that U.S. OJ gallon sales would have increased by 131.9 million SSE gallons due to advertising. However, the increase in price to $1.981 as a result of advertising reduced demand by an estimated 41.5 million SSE gallons, leaving the net increase in U.S. OJ sales at 90.4 million SSE gallons.

With FDOC advertising focusing on the U.S. market, benefits due to advertising were estimated for the U.S market only. However, it should be recognized that to the extent world OJ prices increase by the same amount as the U.S. price increase ($.083 per SSE gallon), not only U.S. imports of OJ, but also Brazil and other country exports of OJ to Europe and other destinations also benefit from the advertising-induced price increases.

*Prepared by Mark G. Brown, Senior Research Economist, Florida Department of Citrus, Economic and Market Research Department, P.O. Box 110249, Gainesville, FL 32611-0249. November 5, 2007. Staff Report #2007-5.

The benefit to the Florida processing industry was measured as the difference between the with- and without-advertising delivered-in revenues, net of imports. Florida domestic[1] movement (total movement less imports) was estimated at 790.1 million SSE gallons without advertising. The associated delivered-in revenue was $1,499.5 million, given the delivered-in price of $1.898. With advertising Florida domestic OJ movement was estimated to increase to 819.9 million SSE gallons (the previous 790.1 million SSE gallons plus a relatively small amount of product diverted from the export market to the domestic market plus the inventory drawdown of 24.9 million SSE gallons[2]). The with-advertising delivered-in revenue was $1,624.1 million, again net of imports and exports. Thus, the increase in delivered-in revenue due to advertising was $124.5 million ($1,624.1 - $1,499.5).

The FDOC cost for OJ promotions in 2006-07 was $23.7 million. Thus, the net benefit-cost ratio was 4.25---($124.5.-$23.7)/$23.7. Netting out pick and haul costs, the on-tree benefits of advertising were estimated at $114.4 million and the associated benefit cost ratio was 3.82.

Import free-rider benefits were estimated as the difference in the value of U.S. net imports (total U.S. imports less non-Florida exports) with advertising and the value without advertising. Net import values were measured using port-of-origin FOB prices. It was estimated that without-advertising, U.S. net imports of 300.7 million SSE gallons had a delivered-in value of $420.9 million ($1.400 per SSE gallon times 300.7 million gallons), while the with-advertising net imports of 361.3 million SSE gallons had a delivered-in value of $535.8 million ($1.483 per SSE gallon times 361.3 million SSE gallons). The net benefits were thus $114.9 million ($535.8 million - $420.9 million)[3]. The import benefits can be broken down into two parts: 1) the without-advertising net imports of 300.7 million SSE gallons sold at a price increase of $.083 per SSE gallon generate an additional $25.0 million ($.083 per gallon times 300.7 million gallons), and 2) the advertising induced increase in net imports of 60.6 million SSE gallon generate $89.9 million ($1.483 per gallon times 60.6 million gallons). In contrast, the Florida delivered-in revenues of $124.5 million can be broken down into $65.6 million due to price, movement constant (790.1 million SSE gallons times $.083 per gallon), and $58.8 million as result of increased sales (29.7 million SSE gallons times $1.981 per SSE gallon).

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[1] Florida exports would also be expected to be impacted by the advertising-induced price changes. With OJ prices increasing as a result of advertising, the export volume would be expected to decrease, and given estimates that export demand is moderately elastic, export revenue would also moderately decrease.

[2] It is assumed that the inventory drawdown is Florida product.

[3] Free-rider benefits were also calculated based on the U.S. landed price or the port of origin price plus transportation costs plus the U.S. tariff. The estimated benefits at the landed price level were $130.7 million. The port of origin and landed prices were calculated as weighted averages across origins, based on U.S. Department of Commerce data. The tariff amount underlying the landed price is hence a weighted average of the full tariff level and reduced tariff levels for imports from some countries (those that have duty-free access to the U.S. market or are subject to a lower tariff than the general most-favored nation tariff level).

U.S. OJ production outside of Florida and drawdown of non-Florida, U.S. inventory are also estimated to benefit by $5.2 million as a result of the OJ price increase due to advertising. Adding these benefits to those for imports, total free rider benefits are $120.1 million.

The estimated Florida benefits of $124.5 million are 3.6% greater than the free-rider benefits of $120.1. In the Ward et al study, Florida benefits were estimated at $153.1 million, nearly double the estimated free-rider benefits of $77.2 million, based on data from the pre-hurricane period from 1999-00 through 2003-04. The latter and present studies, however, differ with respect to calculation of benefits. In the Ward et al study, free rider benefits were 1) based on Florida delivered-in prices, 2) were just for total imports (not net of exports), and 3) did not include benefits for non-Florida, U.S. OJ production or drawdown of non-Florida inventories; additionally, Florida benefits were based on both Florida domestic and export movement. Along with these differences in calculation of benefits, the free-rider and Florida benefit changes from this earlier period to the present are related to the decline over time in Florida production and movement, and the increase in U.S. imports.

From season to season relatively large changes in Florida production and movement, and U.S. imports may occur. Based on preliminary expectations, each of these factors is expected to change significantly in the upcoming 2007-08 season. Assuming the 2007-08 orange crop is 189 million (the midpoint between the Dreyfus and Steger estimates of 180 and 198 million boxes, respectively), it is estimated that in 2007-08 there will be relatively large increases in Florida OJ production and movement, while U.S. imports will decrease significantly. Based on these changes, Florida benefits from advertising for 2007-08 are estimated at $126.6 million, while free-rider benefits (net U.S. imports plus non-Florida, U.S. OJ production plus non-Florida inventory drawdown) are estimated and $90.7 million (Table 2). The estimated 2007-08 Florida benefits are 39.6% greater than the estimated free-rider benefits, compared to being 3.6% more in 2006-07.

The foregoing analysis was based on the assumption that FDOC advertising increases OJ demand by 10.6%, price constant, and 100% of the U.S. market is impacted. Alternatively, assuming that advertising increases demand by 5.0% and 84% of the U.S. market is impacted, the Florida delivered-in (on-tree) net benefit-cost ratio is estimated at 1.11 (.94) in 2006-07. The associated increase in the delivered-in price, Florida delivered-in benefits and free-rider import benefits were $.033 per SSE gallon, $50.0 million and $48.9 million, respectively.

Table 1. 2006-07 OJ Advertising Benefit-Cost Estimates.

		Del-In			On-Tree		
		W/O Adv	With Adv.	Chg	W/O Adv	With Adv.	Chg
Dom. Florida Mov.	mil. sse ga.	988.8	1041.3	52.5	988.8	1041.3	52.5
Florida Imports	mil. sse ga.	198.6	221.4	22.8	198.6	221.4	22.8
Florida Dom. Mov. Less Imports	mil. sse ga.	790.1	819.9	29.7	790.1	819.9	29.7
Del-In or On-Tree Price	$/sse ga.	1.898	1.981	0.083	1.558	1.641	0.083
Florida Rev.	mil. $	1499.5	1624.1	124.5	1230.9	1345.3	114.4
FDOC Costs	mil. $	0	23.7	23.7	0	23.7	23.7
FL Net Benefit-Cost Ratio	(B-C)/C			4.25			3.82
U.S. Imports Less Non-Fl Exports	mil. sse ga.	300.7	361.3	60.6			
Del-In Price	$/sse ga.	1.400	1.483	0.083			
U.S. Free Rider Benefits	mil. $	420.9	535.8	114.9			
Other U.S. Prod. & Inv. Chg	mil. sse ga.	63.1	63.1	0.0			
FOB Price	$/sse ga.	1.917	2.000	0.083			
U.S. Free Rider Benefits	mil. $	121.0	126.2	5.2			

Table 2. 2007-08 OJ Advertising Benefit-Cost Estimates.

		Del-In			On-Tree		
		W/O Adv	With Adv.	Chg	W/O Adv	With Adv.	Chg
Dom. Florida Mov.	mil. sse ga.	1123.1	1179.7	56.6	1123.1	1179.7	56.6
Florida Imports	mil. sse ga.	158.1	182.7	24.6	158.1	182.7	24.6
Florida Dom. Mov. Less Imports	mil. sse ga.	965.1	997.0	32.0	965.1	997.0	32.0
Del-In or On-Tree Price	$/sse ga.	1.191	1.280	0.089	0.851	0.940	0.089
Florida Rev.	mil. $	1149.6	1276.2	126.6	821.5	937.2	115.7
FDOC Costs	mil. $	0	26.8	26.8	0	26.8	26.8
FL Net Benefit-Cost Ratio	(B-C)/C			3.72	2.88		3.31
U.S. Imports Less Non-Fl Exports	mil. sse ga.	188.9	253.5	64.6			
Del-In Price	$/sse ga.	0.945	1.034	0.089			
U.S. Free Rider Benefits	mil. $	178.5	262.1	83.6			
Other U.S. Prod. & Inv. Chg	mil. sse ga.	79.6	79.6	0.0			
FOB Price	$/sse ga.	1.361	1.450	0.089			
U.S. Free Rider Benefits	mil. $	108.3	115.3	7.1			