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Examining the Cost of an All-Organic Diet

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Some consumers have shown a willingness to pay a price premium for organic products because organic agriculture is considered a more environmentally friendly form of agricultural production. These price premiums result from the limited supply relative to demand for organic products and the added cost of maintaining a separate food-distribution system for organic products. The U.S. Organic Foods Production Act of 1990 requires the segregation of organic production and distribution in order to maintain the integrity of foods labeled “organic.” Despite relatively high organic price premiums, demand for organic foods has been growing rapidly (Dimitri and Greene 2002).

Organic price premiums have been examined at the wholesale level, mostly for their impact on farm profitability. Limited data on organic prices at the retail level are reported in a U.S. Dept. of Agriculture (USDA) study on the growth of the U.S. organic market (Dimitri and Greene 2002) and in an examination of retailers’ attitudes toward organic products (Lohr and Semali 2000). Several studies have examined specific categories of organic foods (CDS, Inc. 2002; Glaser and Thompson 1999; Glaser and Thompson 2000; Rosen and Larson 2000). Studies of consumption of organic foods have looked at who buys organic, where they buy organic, and why they buy organic (Estes and Smith 1996; Thompson 1998; Thompson and Kidwell 1998).

Promar International (1999) generalizes that retail organic foods have an average 70% price premium. Thus a household would need 70% more income to consume all organic products and continue spending the same proportion of its

income on food, or that household would spend 17% of its income on food compared to the U.S. average of 10%. Study results regarding the income levels of organic consumers are mixed. Thompson (1998) found that higher-income households were not more likely to purchase organic products, and that some groups of consumers who are committed to buying organic products have relatively low incomes. No studies have analyzed the impact that the higher cost of an all-organic diet could have on food expenditures. The purpose of this research is to assess the impact that organic price premiums could have on consumers trying to purchase an all-organic diet in the mid-Atlantic region of the U.S. using foods that might be consumed by a family during a given period.

Methods

Prices for organic and non-organic products for a shopping list of foods were collected from several stores in a metropolitan area in the region. The shopping list was based on the USDA’s Thrifty Food Plan (Anand et al. 1999) for food purchased at the store to be prepared and consumed at home. The USDA’s Center for Nutrition Policy and Promotion (CNPP 2000) created four basic food plans based on food purchasing patterns of U.S. households, modified to meet nutritional guidelines, with consumption levels adjusted to meet specific cost objectives (Carlson et al. 2003). The lowest-cost of these plans is the Thrifty Food Plan (TFP). Support materials for the TFP include the CNPP publication *Recipes and Tips for Healthy, Thrifty Meals* (CNPP 2000) which contains two weeks of menus for a family of four¹ along with recipes and weekly food lists. Price information for organic and non-organic products is based on these food lists for this analysis. The TFP-based shopping list may not reflect the foods that would be purchased by the “typical” household

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¹ Amounts of food are calculated for children ages 1–2, 3–5, 6–8, and 9–11, for males ages 12–14, 15–19, 20–50, and 50+, and for females ages 12–19, 20–50, and 50+. The family of four that is used for menus and recipes for the TFP consists of a couple (male and female) ages 20 to 50 with two children ages 6 to 8 and 9 to 11.

attempting to consume an all-organic diet because it is based on a minimal cost, nutritious diet developed as the basis for food-stamp allotments (Anand et al. 1999). The shopping list contains a variety of nutritious foods and was modified to reflect common characteristics of organic products.

Food prices were gathered from several retail grocery stores, including national and regional supermarket chains and a consumer food cooperative, during the first week of September, 2004. The least-expensive item (including products that were on sale) was chosen for comparable organic and non-organic versions of a specific product. Several items on the food lists were changed because an organic version was not available (Table 1). There was no acceptable organic substitute for baking powder or soda, salt, chili powder, unflavored gelatin, or evaporated milk; therefore they were not included in the price comparison. Currently, fish cannot be certified as organic under USDA organic regulations although some fish are being sold as “organic” without the USDA organic seal (Ness 2004). No stores in the study area were selling any fish as organic, and although the TFP included several fish products (canned tuna, frozen flounder or cod, frozen breaded fish) on its food list, no fish products were included in the price comparison. Prices were collected for non-organic versions of all products on the food lists.

Tables 2 through 5 show the products that were used in the two weeks of menus developed for the TFP along with their organic price premiums. The “other food items” category includes spices, con-

diments, and products used in small amounts. The USDA food-plan quantities are based on food actually consumed. Cost calculations are for quantities of food actually used during the two weeks, which may differ from the quantity that must be purchased at the store due to package sizes. Organic price premiums are estimated as the ratio of the difference between the organic price and non-organic price relative to the non-organic price.

Results and Discussion

The total cost for the TFP food lists for two weeks of organic products is \$383.71, compared to \$257.72 for the same quantities of non-organic products. Thus the average weekly cost for a family of four to purchase organic foods is \$191.85 versus \$128.66 for non-organic; the family pays, on average, \$63.23 per week or 49% more for the all-organic diet. This is less than the 70% average organic premium found by Promar International in 1999 but is still a considerable added expense to a family’s food budget. Income for a family of four that wants to consume an all-organic diet would have to be 49% higher to maintain the same budget share for food-at-home compared to that for a non-organic diet. For example, the family would need an annual income of \$89,400 to consume an all-organic diet compared to \$60,000 for non-organic.

The impact of an all-organic diet is analyzed using different measures of U.S. family household income. Green and Hoppe (2004) report U.S. average household income as \$57,852 in 2002. Food-

Table 1. Substitutions for Unavailable Organic Products.

No organic version available	Substitute
Canned spinach	Frozen spinach
Canned mushrooms	Fresh mushrooms
Canned mandarin oranges	Fresh oranges
Fudgesicles	Ice cream sandwiches
Dinner rolls	Italian bread
White – bread, hamburger buns, bagels, English muffins, crackers, flour	Whole wheat – bread, hamburger buns, bagels, English muffins, crackers, flour
White rice	Brown rice
Pork and turkey	Produced without the use of antibiotics and hormones and free range
Beef and chicken bouillon	Vegetable bouillon

Table 2. Organic Price Premium: Breads, Cereals, and Other Grain Products; Fats and oils; Sugars and Sweets (%).

Breads, cereals, and other grain products		Fats and oils	
Barley (pearl)	-50	Margarine (tub)	105
Flour (whole wheat)	-1	Mayonnaise	160
Oats (rolled, quick)	-55	Vegetable oil (canola)	102
Rice (brown, long grain)	20	Vegetable shortening	129
Bagels (whole wheat)	60	All fats and oils	122
Bread (whole grain)	7		
Bread (French or Italian)	168	Sugars and sweets	
Bread crumbs	122	Sugar (brown)	211
English muffins (whole wheat)	-15	Sugar (powdered)	254
Hamburger buns (whole wheat)	101	Sugar (white)	137
Ready-to-eat cereal (corn flakes)	139	Grape jelly	325
Ready-to-eat cereal (flakes)	-31	Molasses	-14
Ready-to-eat cereal (toasted oats)	117	Pancake syrup	96
Macaroni	20	Chocolate chips (semi-sweet)	153
Noodles	-21	Chocolate pudding	259
Spaghetti	20	Ice cream sandwiches	169
Crackers (whole wheat)	42	Fruit drink (ready-to-drink)	135
Popcorn (microwave)	4	Lemonade (ready-to-drink)	47
All grain products	23	All sugars and sweets	108

Table 3. Organic Price Premium: Fruits and Milk and Cheese (%).

Fruits	Organic price premium	Milk and cheese	Organic price premium
Apples	88	Lowfat milk	67
Bananas	0	Whole milk	67
Grapes	101	Cheddar cheese	85
Melon (cantaloupe)	0	Cottage cheese	65
Oranges	57	Mozzarella cheese	85
Applesauce	74	All milk and cheese	69
Peaches (canned)	266		
Pears (canned)	173		
Orange juice concentrate	40		
All fruits	61		

Table 4. Organic Price Premium: Vegetables (%).

Fresh vegetables	Organic price premium	Vegetables	Organic price premium
Cabbage	154	Broccoli (frozen)	6
Carrots	0	French fries (frozen)	70
Celery	-47	Green beans (frozen)	-1
Green pepper	-34	Green beans (canned)	101
Leaf lettuce	84	Green peas (frozen)	-1
Mushrooms	-50	Spinach (frozen)	32
Onions	19	Spaghetti sauce	2
Potatoes	25	Tomato paste	120
Tomatoes	-41	Tomato sauce	114
Zucchini	11	Tomato soup	55
		All Vegetables	15

Table 5. Organic Price Premium: Meat and Meat Alternatives and Other Food Items (%).

Meat and meat alternatives	Organic price premium	Other food items	Organic price premium
Beef (chuck roast)	50	Cinnamon	-16
Beef (ground, lean)	79	Cumin	-74
Chicken fryer (whole)	132	Garlic powder	-21
Chicken (thighs)	138	Italian herb seasoning	-17
Pork (ground)	50	Dry mustard	-53
Turkey (breast)	17	Onion powder	-50
Turkey (ground)	-3	Dried onion	85
Turkey ham	23	Oregano	38
Eggs (Grade A, large)	154	Paprika	117
Beans baked (vegetarian)	61	Parsley flakes	217
Beans garbanzo (canned)	38	Black pepper (ground)	209
Beans kidney (canned)	38	Red pepper	-12
Beans northern (canned)	34	Vanilla	-43
Beans lima (dry)	-6	Vegetable bouillon	2
All meat	57	Catsup	172
		Chicken broth	8
		Chocolate drink mix	36
		Cornstarch	450
		Lemon juice (bottled)	145
		Soy sauce	9
		Sweet pickle relish	73
		Vinegar	85
		All other food items	22

price indexes for food at home (Leibtag 2004) for 2003 and 2004² (forecast) were used to deflate the current organic and non-organic food costs for comparison to this 2002 income measure. Annual cost for the non-organic TFP food list is 11% of U.S. average household income, compared to 16% for an all-organic diet. Real median family household income in the U.S. was \$53,991 in 2003 (DeNavas-Walt, Proctor, and Mills 2004). After deflating to 2003, the non-organic TFP food list costs 12% of median family household income, compared to 18% for an all-organic diet. According to the 2002 U.S. Consumer Expenditures Survey, the before-tax income for a consumer unit of 4 people made up of a husband, wife, and two children is \$73,918, with 6.1% of this spent on food for at home consumption (BLS 2004a). Deflating to 2002 as before, the cost of the non-organic food list is 8.6% of this income, and the cost for an all-organic diet is 12.7%. Consumers in our study region appear to be spending a greater share of their income on food at home than the national average.

When non-organic items that were excluded due to the unavailability of an organic version are considered, the average weekly non-organic cost increases from \$128.66 to \$152.87, which is significantly higher than the \$114.80 cost for August 2004 for the TFP for a comparable family of four (CNPP 2004). The use of national average prices for the TFP versus prices obtained in a single metropolitan area may account for some of the difference. In addition, the TFP contains a wider variety of foods than those considered for the two weeks' worth of menus. The consumer price index for food at home in August 2004 is 189 in the Northeast (BLS 2004c) compared to 186.7 for the U.S. (BLS 2004b). Thus food prices may also be higher in the study region. Although the lowest price was used for every item, no attempt was made to search all discount stores or warehouse clubs in the region for the lowest possible per-unit price.

There is significant variation in the organic price premium paid per item, ranging from a high of 450% for cornstarch to a low of -74% for the spice cumin (Tables 2–5). For 23 food items the price for the organic product was lower than for the regular product, and for 3 fresh produce items the organic

and non-organic prices were equal. The fats and oils category had the greatest overall organic price premium, 122%; vegetables had the lowest, 15%.

Recent popular-press articles discuss organic price premiums and provide ways to decide if it is worth paying more for an organic product as well as how to find organic products at the lowest cost (AP 2004; Lazarony 2004; Cropper 2004). Lazarony (2004) gives tips for making an organic diet more affordable, such as joining a food cooperative; buying bulk and in season; preserving foods; finding sales, coupons, and online deals; and purchasing directly from the producer either through a farmers' market or community-supported agriculture (CSA) operation. Cooley and Lass (1998) found that consumers could save \$149 to \$683 on organic produce over the growing season by buying from a CSA, which frequently farms organically (Lass et al. 2003). While there are several farmers' markets, CSAs, roadside stands, and you-pick operations that offer organic products in the study area, no direct markets for organic products were examined in our study.

The Hartman Group found that the consumer segment with the highest propensity to purchase organics also had a higher than average number of households with income under \$25,000 (Thompson 1998). Another consumer segment was very interested in purchasing organics but had lower levels of disposable income than the sample average (Thompson 1998). Thus consumers who desire an all-organic diet may have to pay a greater share of their income for food, spend the time and energy necessary to find lower cost organic products, or limit the number of organic foods included in their diet. A dozen fruits and vegetables (apples, bell peppers, celery, cherries, imported grapes, nectarines, peaches, pears, potatoes, red raspberries, spinach, and strawberries) are consistently the most contaminated with pesticide residues (EWG 2003). Lower income families and groups most vulnerable to adverse health effects from consuming pesticides (children and pregnant women) can reduce the impact of organic price premiums on their budgets by limiting organic purchases to only these products. Organic price premiums for the "most contaminated" fruits in our study (Table 3) were considerably higher than for vegetables, some of which were cheaper than non-organic products (Table 4).

The USDA Women, Infants and Children (WIC) Farmers' Market Nutrition Program (FMNP) pro-

² The percentage change in the food-price index from the previous year for food at home for 2003 was 2.2 and the mean of the forecast for 2004 was 4.0.

vides vouchers for fresh, locally grown produce, including organic. However, the federal food-benefit level of no more than \$20 per recipient per year (FNS 2004b) could quickly be exhausted by purchasing organic foods. Low-income seniors can use vouchers from the Senior Farmers' Market Nutrition Program to purchase fresh produce, including organic (FNS 2004a). One approach to helping low-income recipients obtain organic foods is to increase funding for these programs. Allowing regular WIC vouchers to be used to buy organic varieties of infant cereal and juice would also improve low-income consumers' access to organic products. Food stamps can be used to purchase organic foods, but are not sufficient to provide the needed quantity of foods at higher organic prices. Benefit levels would have to be increased for food-stamp recipients to afford an all-organic diet. As the supply of organic products increases to meet demand, price premiums for organic products should fall.

Our study should be considered a snapshot of what it would cost a family of four to purchase an all-organic diet in a particular time and place. Organic price premiums vary with the season, time, location, and store. A comparison of both organic and non-organic products in just one store would eliminate across-store variation, but no one store carried an organic version of all of the items on the shopping list. Our study does reflect how a family might actually shop by comparing product prices at a number of stores in a limited geographic area; however, it did not look for organic products at all possible stores and did not consider the possibility of coupons. We also did not allow substitution of an organic product in a different package size or with different characteristics, even if the organic price would have been lower, in order to keep the organic product comparable to the non-organic. Becoming a member of the food cooperative and volunteering to work in the store could also reduce prices.

Conclusions

This study used a shopping list based on two weeks of menus developed by the USDA CNPP for the Thrifty Food Plan for a family of four to compare prices of organic and non-organic foods. Overall, an all-organic diet requires payment of a 49% price premium and results in a greater budget share for food (18% compared to 12% based on 2003 income levels) or significantly higher income

levels to maintain budget share. Consumer groups interested in purchasing organics may not be able to afford the higher premiums. Households with members of vulnerable groups—pregnant women and young children—may be unable to find the money for organic products without the help of targeted government programs similar to the WIC Farmers' Market Nutrition Program. Market conditions that have encouraged many firms, including some of the largest food companies, to expand organic production may eventually lead to lower organic price premiums unless demand continues to outpace supply.

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