

# International Consumer Demand for Organic Foods

Gary Thompson

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**SUMMARY.** Sales of organic foods at retail have grown at rates from 20 to 35% in many countries throughout Europe, Asia, and the Americas during the 1990s. Yet market shares of organic foods remain quite small, less than 3% of retail value in all countries throughout the world. As mainstream retail outlets have begun to carry and promote organic foods, lack of availability of organic foods has become less of an impediment to consumer demand. The major impediment to continued growth in organic food demand is high price premiums for organic foods over conventional food counterparts. Some of the highest price premiums at retail are displayed by fresh and frozen vegetables and fruit: premiums as high as 250% for frozen green peas (*Pisum sativum* L.) in the United States have been recorded. Indirect evidence in the form of willingness-to-pay studies and retail pricing experiments indicate that the majority of consumers will not pay such high price premiums for organic fruit and vegetables. Small market shares at retail tend to corroborate consumers' unwillingness to pay such high prices. How much prices of organic fruit and vegetables would have to be reduced relative to conventional produce in order to increase market shares of organic produce is not clear.

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The decade of the 1990s has witnessed the emergence of organic food products from specialty outlets into mainstream retail venues in many countries throughout the world. Yet paradoxically, wider availability of organic foods has not yet boosted retail sales beyond niche market status. Even in the countries with the largest retail markets for organic foods, the share of organic food sales does not exceed 3% of total retail food sales (Table 1). What are the prospects for future growth in organic food sales throughout the world? Why has high growth in sales of organic foods not translated into larger market shares of retail food value? This paper will attempt to answer these questions by first describing the development of organic food markets in major consuming countries and then analyzing consumer traits and behavior as well as market developments which may lead to growth in organic food consumption.

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Department of Agricultural and Resource Economics, P.O. Box 210023, University of Arizona, Tucson, AZ85721-0023.

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## Organic food consumption around the world

All countries with relatively large consumption of organic foods possess high levels of per capita income (Table 1). The sole exception is China where "green" food—not strictly organic foods by most other countries' definitions—has become more popular in some urban areas (Wang et al., 1997). The United States constitutes the single largest market for organic foods followed by Germany and Japan. Various other European countries are the next largest organic markets. The smallest markets for organic foods appear to be Canada, Australia, and Belgium. The markets in which the highest shares of retail sales are organic foods tend to be small countries such as Denmark, Austria, and Switzerland. Per capita expenditures on organic foods are moderately positively correlated ( $r = 0.63$ ) with per capita income levels but a major exception is Japan. In broad terms, organic foods tend to be luxury items in the sense that their consumption is highest in coun-

tries with high per capita incomes.

Piecemeal information about organic food markets in some middle income countries suggests that retail markets are still in early stages of development. In Argentina, about 50 different organic products are available in major supermarkets (Malz, 1998). Imported organic foods and beverages as well as domestically produced organic fruit, vegetables, rice, and tea are sold primarily in specialty stores in Taiwan (Perng, 1998). Organic foods are available on a limited basis in Hong Kong (Thorburn, 1998). In Chile, the market for organic foods is just beginning to be evident: only a single store in Santiago stocked locally produced organic foods like vegetables, eggs, and cheese (Zygmunt, 1998). Some middle income countries will likely have larger shares of organic products in the future but current sales appear to be very modest in absolute terms.

### Importance of organic horticultural products

The incipient nature of many

mainstream markets for organic foods means that comparable data on consumption of organic products in many countries are nonexistent. Nonetheless, spotty data on the composition of organic food items consumed in a few countries do exist (Table 2). Horticultural products—principally fruit and vegetables—are among the most prevalent products in the mix of organic foods sold at retail; fruit and vegetables account for more than two-thirds of retail organic sales in both the United Kingdom and Australia and about half of sales in Austria. Less than half of organic sales are accounted for by fruit and vegetables in France while in Germany they account for just a quarter of retail sales. In all of the countries mentioned, fruit and vegetables together account for the single largest category of organic sales, larger than sales of dairy products, meat, cereals or other categories.

Reliable data for estimating the share of organic horticultural products in the United States are not available. There are several fundamental difficul-

**Table 1. Size and share of organic markets throughout the world.**

Country	Market size 1997 (million \$)	Market share (% of total food sales)	Population (\$) <sup>s</sup>	Gross national product/capita 1995 (\$) <sup>s</sup>	Per capita expenditure on organic food 1995
Europe <sup>z</sup>					
Germany	1,800	1.2	82	27,510	22.0
Italy	750	0.6	58	19,020	13.0
France	720	0.5	56	24,990	12.9
United Kingdom	450	0.4	59	18,700	7.6
Netherlands	350	1.0	16	24,000	22.3
Switzerland	350	2	7	40,630	48.6
Denmark	300	2.5	5	29,890	60.0
Austria	225	2	8	26,890	28.1
Sweden	110	0.6	9	23,750	12.5
Other	200		83	15,226	2.4
Total	5,255		382		13.7
North America					
United States <sup>y</sup>	4,000	1–1.6	266	26,980	15.0
Canada <sup>x</sup>	68	1	30	19,380	2.3
Asia					
Japan <sup>w</sup>	1,700	1	125	39,640	13.6
China <sup>v</sup>	1,200	6		620	
Australia <sup>u</sup>	60	0.2	18	18,720	3.4
New Zealand <sup>t</sup>	22	?	4	14,240	6.1

<sup>z</sup>International Trade Centre, 1999. Other Europe includes Belgium, Finland, Greece, Ireland, Portugal, Spain, and Norway.

<sup>y</sup>Natural Foods Merchandiser, 1998.

<sup>x</sup>Myles, 1997.

<sup>w</sup>Seki, 1997.

<sup>v</sup>Wang et al., 1997.

<sup>u</sup>Hudson, 1996.

<sup>t</sup>Saunders et al., 1997.

<sup>s</sup>World Bank, 1996.

**Table 2. Horticultural products as a percentage of organic food sales.**

Country	Fruit (%)	Vegetables (%)	Total (%)
Australia <sup>z</sup>	34	35	69
United Kingdom <sup>y</sup>	21	47	68
Austria <sup>x</sup>	30	20	50
France <sup>w</sup>	---	---	40
Germany <sup>v</sup>	12	13	25

<sup>z</sup>Hudson, 1996.<sup>y</sup>Latacz-Lohmann and Foster, 1997.<sup>x</sup>Krucsay, 1996.<sup>w</sup>Gauthier, 1996.

ties in obtaining such figures. First, an unknown but presumably significant portion of retail sales of organic fruit and vegetables still take place outside of mainstream retail chains in farmers markets, local cooperatives, roadside stands, and direct deliveries. Seasonal and geographic variation in the availability of fresh organic produce as well as varying rates of shrink or loss in the distribution chain make it impossible to estimate reliably the magnitude and composition of these sales. Second, even sales of organic fruit and vegetables in retail chains are often difficult to track because many bulk items have no bar codes and can not be scanned. Even though price lookup (PLU) codes have been widely adopted, most scanner data services have not collected them because human errors in entering PLU codes by hand lead to poorer quality data than if such items could be scanned. While PLUs for organic products do exist, PLU tracking systems differ across retail chains making aggregation of PLUs tedious and costly. A further complication is that random-weight items such as iceberg lettuce (*Lactuca sativa*

L.) are sold by the head so that no price per unit of weight can be retrieved (Eastwood, 1997). While at least one private company, Willard Bishop Consulting (Barrington, Ill.), assembles PLU-based prices and quantities for industry use, no official statistics are assembled by the U.S. government. One of the principal industry publications, *The Natural Foods Merchandiser* (New Hope Communications, Boulder, Colo.), has revised its methodology for estimating retail sales of various food categories in recent years leading to discrepancies in the estimates of retail sales of fresh fruit and vegetables among other organic products. Jointly these problems in tracking the size and composition of fresh organic produce sales indicate how difficult it is to estimate the size of the market for fresh organic fruit and vegetables.

#### Distribution of retail sales

Where organic foods are sold—supermarkets, hypermarkets, green grocers, health food stores, etc.—matters because if they are only available in specialty stores, most consumers would

have to spend extra time and effort to purchase them. Hence, availability of organic foods at mainstream supermarkets is necessary for organic products to achieve a larger market share. Also, where organic foods are sold is important because consumers self-select by choosing particular retail food stores: shoppers choosing health food stores, for example, are more likely to purchase organics. Limited evidence suggests that some consumers decide prior to entering the store that they will purchase a particular organic item (Hansen and Sørensen, 1993; Thompson and Kidwell, 1998). If consumers who have previously purchased few or no organic food products are to become more frequent organic buyers, availability in convenient locations and formats is necessary.

The distribution of retail sales of organic foods varies significantly from country to country. In most European countries at least half of organic food sales are at multiple retailers (Table 3). Germany is a notable exception where small-scale natural foods outlets still play an important role in retail sales; the apparent lack of promotion of organic foods by some retailers may be one reason why growth in the share of organic food sales seems to have reached a plateau in Germany in recent years. The retail share of organic food sales in France is relatively low and the share of foods sold directly or at farmers markets is almost as high as that sold at multiple retailers (24 versus 28%, respectively). Retail distribution in the United States differs from the European pattern because the emergence of natural foods supermarkets in the 1990s has propelled the growth of

**Table 3. Distribution of retail sales of organic foods.**

Country	Multiple retailers	Other supermarkets/green grocers	Farmers markets/direct sales	Natural foods shops	Cooperatives	Club/discount	Food service	Other
	(%)							
Austria <sup>z</sup>	65	15	10	10				
Belgium <sup>z</sup>	60	15	15	10				
Denmark <sup>z</sup>	75	5	5	15				
Germany <sup>z</sup>	45	10	10	35				
Netherlands <sup>z</sup>	50	5	5	40				
Sweden <sup>z</sup>	80	5	5	10				
U.K. <sup>z</sup>	65	10	20	5				
France <sup>y</sup>	28		24	39	10			
U.S. <sup>x</sup>	31			62		3	2	2

<sup>z</sup>Produce Studies Group, 1998.<sup>y</sup>Gauthier, 1997.<sup>x</sup>Organic Trade Association, 1998.

retail sales of organic foods (Dunn, 1997). Partially as a result of increased competition by natural foods supermarkets in some U.S. metropolitan areas, mainstream supermarket chains have begun to stock and promote a wider array of organic foods (Weir, 1998). However, the proportion of organic food sales in mainstream supermarket chains is still relatively low.

Industry observers in the Europe and the United States agree that commitment to promote organic foods was and is essential for continued growth in retail sales. In the United States, competition between the two largest natural foods supermarket chains, Whole Foods Market (Austin, Texas) and Wild Oats (Boulder, Colo.), has led to increased sales of organic foods. In Denmark, the FDB chain (Albertslund, Denmark) made a commitment to promote organic foods with the result that retail sales grew significantly (Michelson, 1996). Sweden's largest supermarket chain, ICA (Solna, Sweden), has made serious efforts in promoting organic products while Gröna Konsum (Stockholm, Sweden), a Swedish consumer cooperative, claims to have the highest share of organic foods of any supermarket in Europe (U.S. Embassy, Stockholm, 1998). In the last couple of years, upscale supermarkets like Waitrose

Supermarkets (London) and J. Sainsbury (London) in the United Kingdom as well as Tesco Stores (Hertfordshire, U.K.) now sell over 300 organic food items ranging from fresh fruit and vegetables to dairy and convenience foods (Waitrose Supermarkets, 1999; J Sainsbury plc, 1998; Tesco Stores Ltd., 1998). In Austria, Billa (Wiener Neudorf, Austria) and Spar (Salzburg, Austria) chains have actively promoted their own store brands of organic foods with apparent wide recognition by consumers (Zenner and Ziehlberg, 1998). Swiss retail chains Migros (Fédération des coopératives Migros, Zurich, Switzerland) and Coop Suisse (Bâle, Switzerland), which account for over three quarters of retail food sales, promote more than 130 organic foods including baby foods, bread, dairy, sugar, tea, soft drinks and wine, all with the Bio-Label or organic certification (Wyler, 1998). Albert Heijn (Zaandam, The Netherlands) recently announced the introduction their AH Biologisch brand of organic foods which includes a wide array of fresh and processed items, suggesting that organic food sales in The Netherlands are poised to grow (van der Harst-Collaris, 1998). Although market share in France still lags behind neighboring European countries, Carrefour (Paris), the sec-

ond largest supermarket chain in France, now carries over 60 organic products (Gauthier 1998). Information on retail markets in Japan is sketchy, but it appears two large corporations with food manufacturing interests, Sumitomo (Tokyo) and Nissho Iwai (Tokyo), have special teams developing processed foods such as frozen organic vegetables which will, in turn, need promotion at retail food venues (Seki, 1997). The commitment by mainstream supermarkets and manufacturers to promote a wider array of organic products is making a wider array of organic foods available to much larger segments of consumers at retail throughout the world.

In the United States and many European countries, food consumed away from home now constitutes nearly half the value of all food consumed. As such, both food service and institutional buyers represent important potential channels for organic foods. In the United States, fresh organic fruit and vegetables have found apparently important niche markets among a select group of gourmet restaurants (Frithe, 1998). Some home delivery companies such as The Fresh Kitchen (Boston) even offer baby, children, and adult organic foods. Anecdotal evidence from Europe also suggests that certain organic foods are begin-

**Table 4. Estimated purchasing frequency of organic foods.**

Country	Frequency of purchase			Year
	Regular	Have bought	Never	
Germany <sup>z</sup>	5	42	53	1984
Germany <sup>z</sup>	12	51	37	1989
Germany <sup>z</sup>	15	61	25	1994
Sweden <sup>y</sup>	14	19	41	1991
U.K. <sup>x</sup>	13	41	75	1993/1997
Spain <sup>w</sup>	9	64	26	1997
France <sup>v</sup>	6	23		1995
The Netherlands <sup>u</sup>	5	40	58	1990/1991
Denmark <sup>t</sup>		30		1994
Scotland <sup>s</sup>		29		1993
U.S. region <sup>r</sup>				
Northeastern		37		1997
North-central		24		1997
Southern		26		1997
Western		29		1997

<sup>z</sup>Alvensleben, 1997.

<sup>y</sup>Bjerke, 1992 cited in Hansen & Sorensen, 1993.

<sup>x</sup>Davies et al., 1995 (Regular, Have bought); ACNielsen, 1997 (Never).

<sup>w</sup>Gracia et al., 1998.

<sup>v</sup>Gauthier, 1996.

<sup>u</sup>van der Harst-Collaris, 1997 (Regular, Have bought); Hack, 1993 (Never).

<sup>t</sup>Bredhal Johansen, 1995 cited in Axelson, 1996.

<sup>s</sup>Tregear et al., 1994.

<sup>r</sup>Food Marketing Institute/PREVENTION, 1997.

ning to appear in restaurants of many types and in various institutional settings. McDonald's restaurants (Oak Brook, Ill.) in Sweden offer organic milk and coffee; one quarter of the Swedish municipalities have schools or hospitals with some organic foods served; and train restaurant cars feature organic milk and coffee (U.S. Embassy, Stockholm, 1998). Swissair (Zurich, Switzerland) and Lufthansa (Cologne, Germany) business class food services now offer organic fare for passengers. Organic chocolate, tea, coffee, and even white sugar are available in many countries. Quantifying the value of organic foods consumed through food service and institutional channels is exceedingly difficult but consumers' exposure to these organic foods in various public places makes them more aware of the widening array of organic food products available.

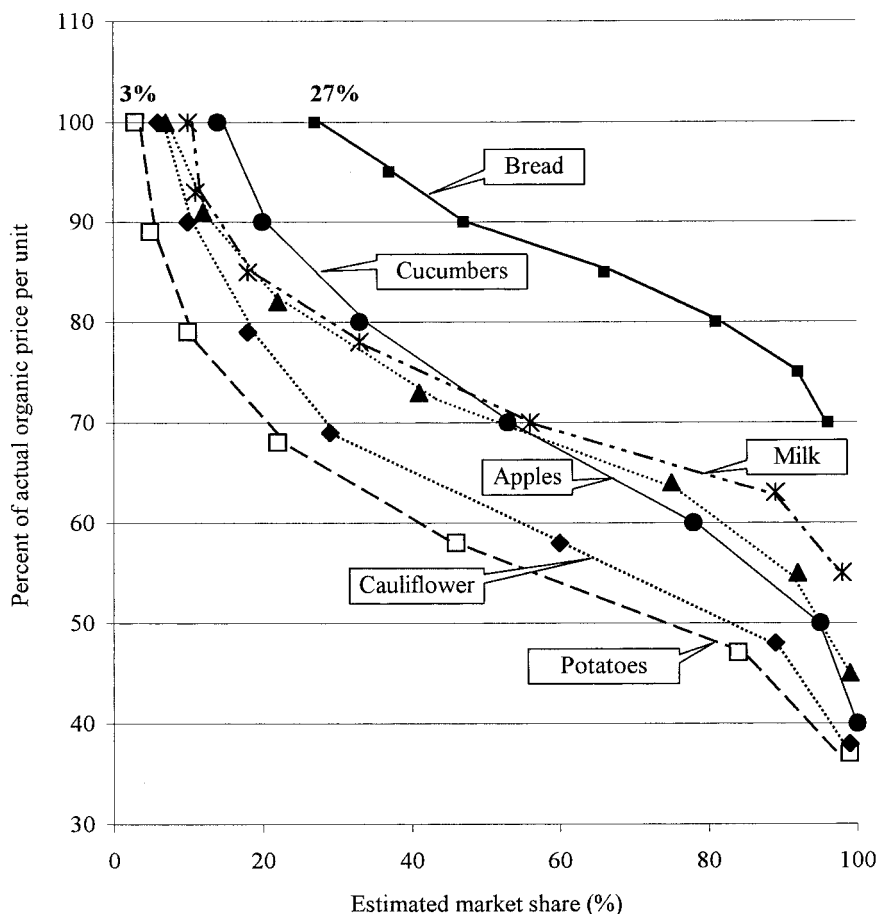
### Characteristics of consumers buying organic foods

Although the types of consumers likely to be regular purchasers of organic foods vary considerably across countries, the proportion of consumers regularly buying organic foods is relatively small, usually less than 15% of shoppers (Table 4). Evidence from the mid-1980s to the mid-1990s in Germany suggests that more consumers have apparently become regular purchasers. Yet in France and The Netherlands the proportion of regular buyers of organic foods is currently quite small. These figures suggest that even in the largest organic food markets throughout the world, anywhere from one-fourth to three-fourths of consumers have never purchased organic foods of any sort. Even those consumers professing to be regular consumers still account for a relatively small proportion of retail sales as the respective market shares of organic foods in those countries indicate.

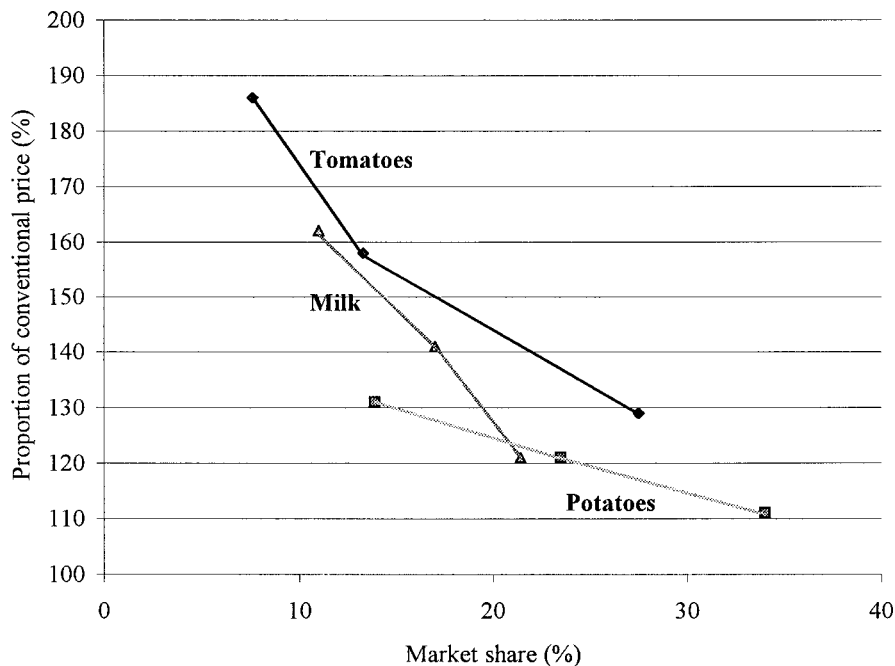
Consumers more likely to purchase organics do not always fall into well defined categories across countries. In the United States, there are several consumer segments which seem to be more likely to purchase organics (Thompson, 1998). Socioeconomic and demographic factors such as income, age, gender, education, marital status, and presence of children in the household may be examined to char-

acterize consumers more likely to buy organic food. Although the joint evidence of U.S. academic and industry studies does not always coincide, studies suggest a bimodal pattern associated with income and organic food purchases: selected lower and higher income groups may be more likely to buy organic foods while middle income consumers are less likely to do so (The Packer, 1998; Hartman Group, 1996). Some evidence suggests, however, that certain high income consumers are sensitive to organic price premiums (Baker and Crosbie, 1993; Thompson and Kidwell, 1998). Bimodal behavior with respect to age also occurs: consumers in the 18 to 29 and 40 to 49 years of age brackets are most likely to have bought organic produce (The Packer, 1998). The former group apparently is more concerned with environmental issues associated with organic foods whereas the latter purchases organic foods more for health reasons (Hartman Group, 1996; Food Marketing Institute/PREVENTION, 1997). Gender and marital status generally are poor predictors

of likelihood of purchasing organic foods but one segment of consumers, denoted the True Naturals by the Hartman Group (Bellevue, Wash.), has a higher than average percentage of divorced women. In some cases, higher levels of educational attainment are positively correlated with higher likelihood of purchasing organic foods (Hartman Group, 1996; Food Marketing Institute/PREVENTION, 1997; Swanson and Lewis, 1993). However, some studies have found no evidence linking educational attainment with organic food purchases (Jolly, 1991; Goldman and Clancy, 1991). A few studies indicate that attainment of postgraduate or professional degrees may even diminish the likelihood of purchasing organic foods (Byrne et al., 1991; Thompson and Kidwell, 1998). Finally, presence of children in the household likely increases the probability of purchasing organic foods (Thompson and Kidwell, 1998) but few studies have considered more than the effects of household size irrespective of family members' ages on decisions to buy organic foods. In very



**Fig. 1. Estimated market share of Dutch horticultural products (calculations from data in Baggerman and Hack, 1992).**



**Fig. 2. Experimental market share of Danish organic foods (Hansen and Sørensen, 1993).**

broad terms, two important segments likely to purchase organic foods are 1) younger, single consumers with low household incomes and 2) middle age consumers with higher household incomes, in some cases with children living at home.

European consumers of organics display some similarities to their U.S. counterparts. In Germany, for example, two groups are more interested in organic foods: 1) young people with strong criticisms of conventional food supplies and 2) older people with strong health consciousness (Alvensleben and Altmann, 1987). Related research from Germany posits that income and prices play less of a role in identifying organic consumers than do consumer attitudes (Fricke and Alvensleben, 1997). In Northern Ireland, the group most likely to consume organics is comprised of women between the ages of 30 to 49 years with children and high household incomes (Davies et al., 1995). In contrast to the German research, these Northern Ireland results suggest indirectly that prices and income are important determinants in identifying organic consumers especially when children's health concerns are present.

Indirect evidence concerning the market share of baby foods in the United States corroborates the importance of children in a household's decision to purchase organic foods. In the United States, while about 1% of total retail

food sales in 1995 were organic foods, baby foods accounted for 2.5% of baby foods sold in U.S. supermarkets (Harris, 1997). In Sweden, the ICA retail chain reports that 7% of the baby foods sold were organic, about twice the market share of organic products in any other processed food category of ICA (U.S. Embassy, Stockholm, 1998). This anecdotal evidence suggests that some countries may expect substantial increases in future organic baby food sales. France, for example, currently has the highest per baby consumption of baby foods in the world at 95 kg (209 lb) per baby (Sharpless and Gauthier, 1998). As organic food purchases increase in France, purchases of organic baby foods will likely increase markedly.

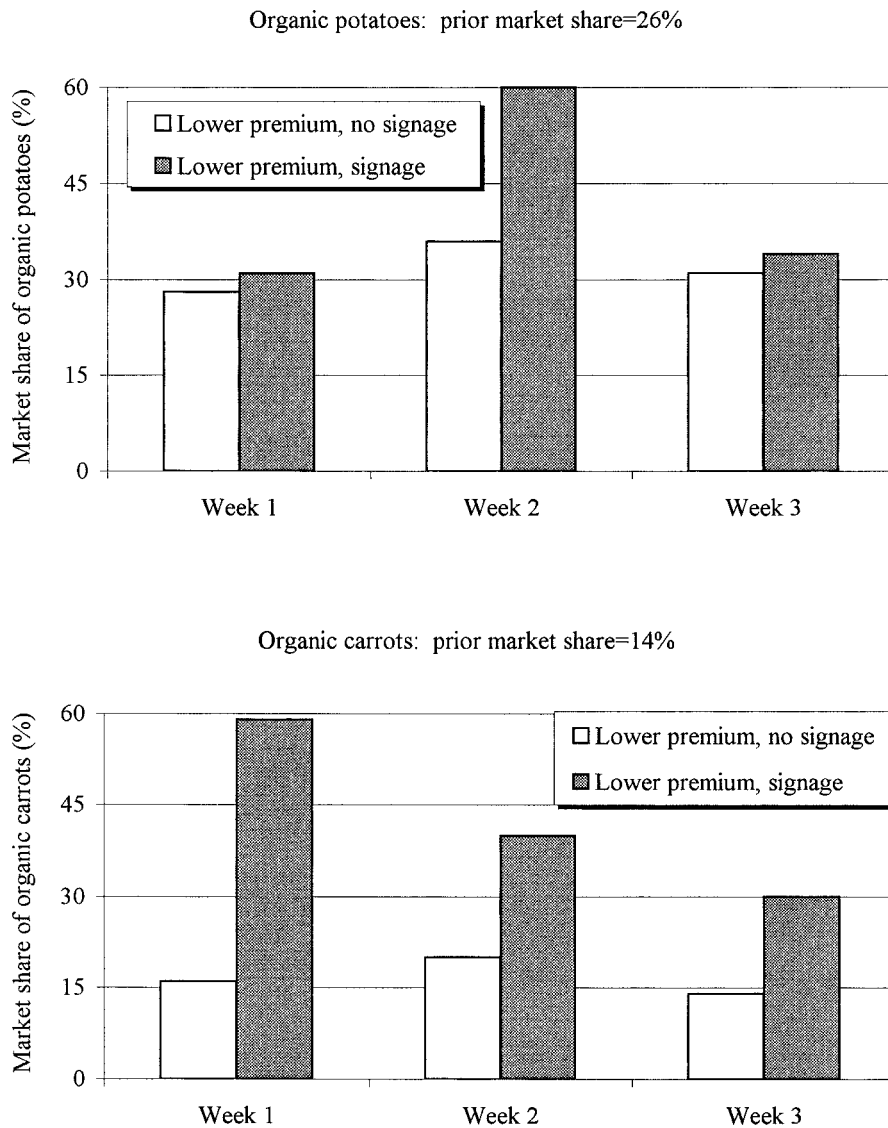
### Willingness to pay for organic foods

Many studies around the world have attempted to estimate consumers' willingness to pay more for organic foods. The popularity of willingness-to-pay studies likely owes more to the paucity of data about actual consumer behavior than it does to the accuracy of the methods available for estimating how much consumers are willing to pay. Despite their shortcomings willingness-to-pay studies have been conducted in the United States (Misra et al., 1991; Weaver et al., 1992), The Netherlands (Baggerman and Hack, 1992), Spain (Gracia Royo

et al., 1998), Italy (Vastola, 1997), Denmark (Hansen and Sørensen, 1993), and New Zealand (Saunders, 1999). Some studies query the willingness to pay for predetermined price premiums while others use various hypothetical questioning techniques to arrive at premiums. As would be expected, habitual buyers of organic foods consistently are willing to pay higher premiums than are consumers buying less frequently or never (Hack, 1993; Gracia Royo et al., 1998). Limited evidence also suggests that some consumers are willing to pay higher premiums for fruit and vegetables than for any other food category except beef (Gracia et al., 1998).

By systematically varying the willingness-to-pay levels over a wide range, researchers are able to generate a schedule of willingness to pay akin to a traditional demand curves (Fig. 1). Their schedules of willingness to pay can give crude estimates of how market shares may grow as organic prices drop. Baggerman and Hack (1992) generated such willingness-to-pay estimates for four horticultural products—potatoes (*Solanum tuberosum* L.), apples [*Malus sylvestris* (L.) Mill.], cauliflower (*Brassica oleracea* L. Botrytis Group), and cucumbers (*Cucumis sativus* L.)—as well as for staples such as milk and bread. Their results indicated that estimated market shares for horticultural products at actual organic prices were generally lower than for milk (10%) and bread (27%). However, all their estimated market shares based on willingness-to-pay answers exceeded actual market shares for the same products, thereby illustrating the upward bias of many willingness-to-pay methodologies.

Studies of willingness to pay have been augmented by experimental studies which compare purchases in experimental situations with each participant's stated willingness to pay. Hansen and Sørensen conducted an experiment in which Danish shoppers were given money to purchase organic or conventional skim milk, potatoes, and tomatoes (*Lycopersicon esculentum* Mill.) displayed in a room apart from the rest of the store. The volunteer shoppers had already decided to shop at the selected FDB outlets which had an enhanced array of organic products compared to other stores at the time. Because of their prior store choice, this sample of shoppers might not accurately represent other



**Fig. 3. Actual market shares of Swedish organic produce (Björkman, 1994).**

Danish consumers. Nonetheless, their experimental results support two important conclusions. First, experimental purchases corroborate that stated willingness to pay often exceeds actual payment behavior in an experimental setting. Experimental estimates placed the market share of organic skim milk at 11% while actual share in FDB stores at the time was 12%; estimates of willingness to pay for organic skim milk placed market share at higher percentages. Second, and perhaps more important, shoppers displayed pronounced sensitivity to decreases in organic prices: the market share of organic skim milk would almost double from 11 to 21.4% if the price premium were lowered from 62 to 21% of the conventional counterpart. Quantities purchased of organic potatoes were even more sensitive to price reductions: organic market share could be increased

from 13.9 to 34% if price premiums were reduced from 31 to 11% of conventional prices. Figure 2 displays the respective market shares for the three products at the price premiums used in the experiment. The important implication of these experiments is that even with frequently purchased, habit-determined items like milk, reductions in organic price premiums might induce sizable increases in market share at retail. For fresh horticultural products such as potatoes and tomatoes, reductions in price premiums could lead to significant increases in market share.

A few market experiments have been conducted to observe how consumers respond in a controlled environment to actual changes in organic price premiums (Björkman, 1994; Reicks et al., 1997). In Sweden, reductions in organic price premiums alone and in

conjunction with increased advertising and in-store signage were measured for fresh potatoes and carrots (*Daucus carota* L.) (Björkman, 1994). Björkman (1994) arranged for a retail outlet in Södern, Stockholm to lower price premiums on organic potatoes and carrots for 3-week periods. During the first 3-week period, only price premiums were reduced from an average of 55% to just 25% of the conventional potatoes and carrots. An interim period of 5 weeks elapsed before a subsequent 3-week period in which organic price premiums were reduced again to 25% of conventional and in-store signage was simultaneously increased. The results were not consistent across the two produce items: more prominent signage increased market share of carrots more notably in all weeks than it did for potatoes although differences in signage effects between the two products were not tested for statistical significance (Fig. 3). Lowering prices required about 1 week before quantities sold increased; for both carrots and potatoes the effects of lowering prices did not appear to be sustained through the third week of the experiment. While a number of factors could have caused the declining effect of lowered premiums and signage in the third week of the experiment, one hypothesis consistent with the behavior observed is that shoppers who had not previously purchased these organic products were attracted by either lower relative price or signage, or both, but did not continue with weekly purchases of those produce items. Both carrots and potatoes can be stored for more than 1 week so that they may be purchased at intervals of more than a week.

The effects of point-of-purchase signage on the sales of 14 organic food items in both upscale and a discount/warehouse stores were tracked in the Minneapolis/St. Paul, Minn., area (Reicks et al., 1997). Not only did increased signage have differential effects across organic food items, but the effects of signage differed across the two types of stores; sales of a larger array of items were augmented with signage at the discount/warehouse stores than at the upscale stores. The demographic profiles of customers recognizing signage also varied: those shoppers most likely to recognize new signage were young people, women, and those having larger household sizes. The Stockholm and Minneapolis/St. Paul studies corroborate the industry consensus that without

active promotion, simply having a wider array of organic products available at mainstream retail venues will not be sufficient to enhance the market share of organic foods. What is less clear, however, from these two studies is how important reducing price premiums may be in stimulating organic food sales throughout the world. Reicks et al. (1997) did not analyze changes in prices whereas Björkman (1994) observed prices changes for just two fresh products during relatively short 3-week periods.

### Price premiums for organic foods

Reliable information of price premiums for organic foods is exceedingly difficult to obtain for a number of reasons. First, many products are of recent vintage so that sales data simply did not

exist before this decade. Second, until the past 5 years, many fresh and processed organic foods were sold outside mainstream supermarkets so that scanner data companies did not capture sales information. Now scanner data are being collected but these data must be purchased at relatively high cost from companies like ACNielsen (Stamford, Conn.) and IRI (Information Resources, Inc., Chicago, Ill.). Even with the advent of usable data series for scanned products, data for many fresh produce items not bearing UPC codes are still sparse.

Some very tentative hypotheses about retail price premiums can be made on the basis of the few isolated reports publicly available throughout the world (Table 5). Retail price premiums on fresh organic fruit and vegetables as well as frozen vegetables appear to be

high relative to premiums for other processed organic foods. Price premiums in excess of 100%—double the conventional price—appear common for both frozen and fresh produce. Data are insufficient for comparing premiums of horticultural and nonhorticultural items in most countries but in Sweden the premiums for nonhorticultural products tended to be smaller. Anecdotal evidence for isolated products elsewhere tends to corroborate these findings. For example, in The Netherlands, Langezaal (1996) reported that biodynamic (organic) cheese is 60% costlier than the conventional counterpart. Crutchfield et al., cited in Glaser et al. (1998), reported that monthly average price premiums for fresh organic broccoli (*Brassica oleracea* L. Italica Group) in the United States rose from 77 to 145% in the period from 1992 to 1995. Whole-

**Table 5. Retail price premiums for organic foods as a percentage of conventional prices.**

Food	Sweden <sup>z</sup>	U.S.			Netherlands <sup>t</sup>	
	1998	1996 National <sup>y</sup>	1995 Tucson <sup>x</sup>	1992 Denver <sup>v</sup>	1991 Tucson <sup>u</sup>	
Fresh	?					
Apples				143	18	120
Golden Delicious	98					
Red Delicious			42			
Broccoli			81	135		
Cauliflower						167
Carrots			175	125	86	
Lettuce				195	16	
Green leaf lettuce			91		61	
Tomatoes			45		128	
Potatoes				159	31	171
Cucumbers						150
Frozen						
Broccoli	139	164				
Peas	0	230				
Green beans		174				
Sweet corn		96				
French fried potatoes		194				
Canned						
Tomatoes	125					
Other Foods						
Orange marmalade	10					
Peanut butter	39					
Bread	13					43
Cheese	11					
Yogurt	24					
Spaghetti	37					
Ketchup	32					
Coffee	18					

<sup>z</sup>U.S. Embassy, Stockholm, 1998.

<sup>y</sup>Glaser et al., 1998.

<sup>x</sup>Thompson and Kidwell, 1998.

<sup>v</sup>Sparling et al., 1992.

<sup>u</sup>Conklin et al., 1992.

<sup>t</sup>Baggerman and Hack, 1992.



sale price premiums in Boston for organic carrots and mesclun are of similar magnitudes, ranging from as low as 8% to as high as 157% (Greene and Calvin, 1997).

The ranges or average price premiums reported for many countries are conspicuously lower than many of the premiums displayed in Table 5. Typical figures are Sweden, 38.6% (average of first column in Table 5); Netherlands, 20 to 50% (van der Harst-Collaris and Scandurra, 1997); Austria, 20% (Krucsay, 1996); Australia, 12.5 to 60% (Hudson, 1996); and France, 20 to 100% (Gauthier, 1996). Some studies do recognize, however, that premiums on fresh fruit and vegetables may fluctuate to as high as 200% depending on season and weather events (Produce Studies Group, 1998). What averages and ranges of price premiums tend to mask are apparently higher premiums for fresh and even frozen fruit and vegetables.

Lower organic yields and more volatility in organic supply are likely causes for the relatively large price premiums for fresh organic produce. Yields for organic fruit and vegetables tend to be lower than for their conventional counterparts especially in years following transition of land from conventional to organic production. The notorious f.o.b. (free on board) price volatility experienced by conventional growers when adverse weather strikes is likely exacerbated for organic farmers who cannot take recourse to agrochemicals to mitigate the impacts of adverse weather, pests, and diseases. The opportunities to diversify spatially, as many conventional grower-shippers do (Wilson et al., 1997), may be fewer because organic farm land typically requires some years in transition before produce can be certified organic. Lastly, import costs of out-of-season produce items are likely to be relatively high because there are fewer organic than conventional suppliers internationally and organic certification costs for imports can be considerable (Lohr, 1998). Preservation of organic products along the marketing channel from farm gate, handling, processing, and delivery can also contribute to higher premiums at retail.

The important implication of relatively high price premiums for organic foods in general and organic fruit and vegetables in particular is that they are simply too expensive for the majority

of consumers. Even those consumers who identify themselves in surveys as potentially interested in organic foods do not actually purchase organic products because there are cheaper alternatives. There are only two econometric studies based on scanner data of actual buying behavior in the United States which tests the hypothesis that high price premiums inhibit purchases of organic foods (Glaser et al., 1998; Glaser and Thompson, 1999). Both studies use aggregate U.S. data from ACNielsen for 1990 to 1996. Glaser et al. estimated single-equation demand relationships while Glaser and Thompson estimated a demand system for pairs of organic and conventional frozen green beans (*Phaseolus vulgaris* L.), green peas, corn (*Zea mays* L.), and broccoli. In the latter study, own-price response to reductions in organic prices was considerable with own-price elasticities ranging from -1.630 to -2.268. These elasticities indicate that a 10% reduction in, say, organic broccoli would result in a 22.68% increase in consumption from average levels during the 1990-96 sample period. By contrast, own-price elasticities for conventional frozen vegetables were smaller—from -0.596 to -1.043—and not always statistically significant. These elasticity estimates mean that as the price of organic frozen vegetables decline, quantities consumed will more than proportionally increase, resulting in higher market shares of organic frozen vegetables. Hence, at least for frozen vegetables, high organic price premiums are a serious obstacle to increased organic market share.

### Prospects for growth in demand for organic foods

Future growth in the demand for organic products will hinge on how much price premiums for organic foods can be reduced. The initial obstacles to growth—the consistent availability of a wide array of organic products in convenient locations and consumers' familiarity with those products—are beginning to be surmounted in the larger markets throughout the world. As more organic products of consistent quality have become available in mainstream supermarkets and through food service channels, the principle barrier to continued growth is high price. Lower prices will induce more frequent purchases of a wider array of

products by those consumers already buying some organic items. And lower prices will attract new consumers who previously found organic foods too expensive. Both phenomena are necessary for growth in the demand of organic foods.

Several supply and demand factors are critical in determining how much prices can be reduced.

### Supply conditions affecting price premiums

Seasonality in production presents a serious hurdle to reducing organic price premiums, particularly for highly perishable fresh fruit and vegetables. Many conventional grower-shippers diversify geographically, whether it be within a single country or throughout the world, in order to provide produce continuously throughout the year. The more distant are production regions, the more costly coordination of year-round production becomes especially when production conditions, business practices, and languages change from place to place. The costs of sourcing perishables year-round could be even higher for organic produce because there are relatively fewer growers from which to choose and certified production areas are relatively smaller. Further, certification regulations also differ across areas and countries making international transactions even costlier. Shipping and distribution costs for organic operations will be higher than their conventional counterparts due to greater losses in transit from spoilage and diseconomies of scale for smaller operations. All these factors, in addition to lower yields and higher volatility in supplies for organic products, suggest that price premiums for fresh fruit and vegetables will continue to be large.

For countries with limited opportunities to diversify domestic production of fresh fruit and vegetables, these obstacles to reducing price premiums are more formidable. In the United Kingdom, for example, about 70% of all organic foods are imported (Canadian High Commission, 1998), a large portion of which are presumably imports of out-of-season fresh produce items. If greenhouse production were compatible with organic production methods, domestic production capacity could be augmented but winter production in greenhouses is costly. If,

as is more likely, greenhouse production cannot be made compatible with organic production techniques, UK consumers will have to rely on imports of organic fresh fruit and vegetables exclusively for subtropical and tropical items and for other items during many months of the year when domestic production is not possible. Advances in fresh processing technology may mitigate these problems in the future but for now freezing, canning, drying, and other processes are the only alternatives to fresh products especially for fruit.

### Marketing conditions affecting price premiums

Retail prices of organic foods depend on the costs of production, packaging, marketing, and distribution. But retail organizations such as supermarket chains also have different pricing mechanisms depending not only on cost of acquisition of goods but also the types of food items considered as well as their business strategies. Hypermarkets, for example, typically follow everyday, low-price schemes based on scale economies in acquisition, logistics, and management of information. Green grocers, by contrast, may follow simple markup rules for determining retail prices. Supermarkets typically advertise certain products each week as loss-leaders in an attempt to lure customers into the store.

How large organic price premiums are at retail is affected both by costs and pricing strategies. Price premiums are high in some mainstream U.S. supermarkets because the labor and management costs associate with their promotion are relatively high (Weir, 1998). Some supermarkets have adopted a policy of attempting to limit organic price premiums to fixed upper limits. Limiting price premiums may be a viable short-run strategy for attracting some consumers but ultimately competition for shelf space will drive most chains to make retail prices reflect their costs of acquisition. This means that economies of scale in buying, distribution, and management are the most likely sources for reducing price premiums by retail organizations.

### Governmental intervention affecting price premiums

Some observers argue that retail

prices of conventional foods are lower precisely because the costs of negative externalities resulting from conventional production practices are not included in their market prices (Latacz-Lohmann and Foster, 1997). This phenomenon is an example of market failure in which governments may be justified in intervening to make private costs more closely reflect social costs. Market failure and other arguments have been advanced in the European Union and some individual European countries for providing subsidies of different types to promote organic production and consumption. The most common type of subsidy is to farmers for converting land to organic production (Michelson, 1996). Subsidies for generic advertising have also been pursued in Denmark, The Netherlands, and France among others. To the extent these subsidies lower the retail prices of organic products, they foster growth of the organic food market. Michelson (1996) argues that government subsidies of this sort in conjunction with the commitment by industry officials to promote organic foods has been the key to rapid growth of the sector in Denmark.

### Conclusions

The availability of data to analyze consumer demand for organic foods are spotty and scarce because only recently have organic foods been sold in supermarkets where scanner data are collected. At present, much of the information used to analyze consumer demand is by necessity circumstantial and indirect, often with consumers' self-reported behavior rather than independent observation of their behavior in actual markets.

Throughout the world, the early consumers of organic foods were those people residing in upper-income countries who were willing to pay extra for organic foods. Their motivations for paying extra were many: environmentally friendly production methods; ingestion of lower levels of pesticides in foods; foods grown by locally owned, small family farms; less exposure of farm workers to pesticides; and perceived better flavor or nutritional content, among others. But the proportion of the populations holding these concerns strongly enough to pay extra is quite small. Others who may share these concerns have been reluctant to pay extra. Still others do not share

these concerns or are simply not cognizant of them. The point is that for all but a select few, relative prices of organic and conventional food items are the most important consideration in buying food. Without significant reductions in retail price premiums, the market share of organic foods will remain very small.

Quantitative estimates of how much consumers in the aggregate are likely to respond to lower price premiums are sorely lacking. While many surveys have found that consumers are willing to pay more for organic foods, actual behavior belies their responses. Economic experiments and limited retail evidence suggest that the increase in organic purchases resulting from lower price premiums at retail are substantial although when price premiums are as high as 200%, small reductions in those premiums have little detectable effect. Reductions of retail price premiums in conjunction with augmented signage and promotion have greater effects than price reductions alone. If occasional buyers of organic foods are to become more regular purchasers of a wider variety of items, and if new buyers of organic foods are to become first-time purchasers, price premiums at retail must fall. Only then will the market share of organic foods throughout the world increase significantly beyond current levels.

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