

Methodology

To determine the cost of fruits and vegetables, we used 1999 ACNielsen Homescan data, which collect information from a sample of consumers on the foods they buy from all types of retail outlets (see box, “About the Data”). We restricted the data to the most common fresh fruits and vegetables, excluding more exotic items such as guava or bok choy. We included 25 different fresh fruits and 29 different fresh vegetables. For some of the fresh vegetables, we included more than one type of that vegetable, such as whole and baby carrots, and broccoli and broccoli florets. We then matched all the fresh fruits and vegetables with their plain (e.g., unsweetened, unflavored) processed counterparts. Some of the processed items included more than one form of that fruit or vegetable. For example, for processed cherries we included canned and frozen sweet and tart cherries, and for asparagus, we included cut and whole canned and frozen asparagus. We also included in the analysis one processed fruit (dried figs) and one processed vegetable (canned beets) for which we were unable to obtain fresh prices. We excluded fresh cranberries, all forms of lemons and limes, and dehydrated onions because they are not typically consumed as a serving, but rather used as an ingredient. We also excluded dried beans. The final sample consisted of 27 fruits and 30 vegetables, in 69 different forms of these fruits and 85 different forms of these vegetables (table 1).

Because the analysis included only plain processed versions, many popular items are excluded, such as tomato sauce, sweetened or flavored applesauce, fruits canned in syrup, frozen vegetables in sauces, and all mixtures of fruits or vegetables—such as carrots and peas or mixed melon balls. Our final sample accounted for 66 percent of all fruit retail sales (in dollars) and 59 percent of all vegetable sales. (Dried beans alone, which were not included in the analysis, accounted for 4.5 percent of all vegetable sales in dollars.)

For each item, we estimated the 1999 retail price per pound (weighted-average) by dividing the total dollars spent on that item by the total volume sold. This retail price per pound is the cost of *buying* fruits and vegetables. These prices represent the average price for all households’ purchases.

However, many fruits and vegetables contain much that is nonedible in the purchase weight. For example, we do not eat the cob and husk of fresh corn, or the rind on fresh watermelon. In addition, some edible parts are often removed during food preparation, such as stalks of celery or fresh broccoli. Among canned forms, the canning liquid was not counted as part of the serving except in the case of fruits packed in fruit juice, in which case the canning liquid—a fruit juice—was considered part of the fruit serving.

As a result of these corrections, a comparison of the price per pound may not be a good indicator of the cost per amount consumed. Therefore, for each item, we used conversion factors from the USDA Food and Nutrition Service’s *Food Buying Guide for Child Nutrition Programs, 2000*, to estimate the number of FGP servings obtained from a pound of the purchased item. These factors exclude all parts of the fruits and vegetables not usually eaten, such as the canning liquid in canned green beans (see box on how we estimated the number of servings). Using the number of servings per pound,

About the Data

We obtained retail prices using ACNielsen Homescan data

for 1999. These data represent 7,195 households' food purchases at a variety of retail outlets nationwide, such as supermarkets, grocery stores, farmers' markets, mass merchandising outlets, and drugstores. Included households were in the sample for at least 10 months of the year. After a shopping occasion, households scanned each item purchased. The data captured only foods purchased at retail, not foods purchased at a foodservice outlet, such as restaurants or fast-food places.

The analysis covered fruits and vegetables that are estimated in the National Food Supply, for which we were able to obtain prices (27 fruits, 30 vegetables—see table 1). For comparison, and to eliminate nutritional differences, we selected processed versions—canned, frozen, dried, or juice products—that were most similar to the fresh version. For example, to the extent possible, we priced only unsweetened fruit juice, canned fruit packed in water or juice, and plain frozen fruits and vegetables with no additional ingredients. As a result, popular products—such as canned tomato sauce, ketchup, frozen mixtures of peas and carrots, frozen mixed melon balls, canned fruit packed in syrup, sweetened juices, or sweetened applesauce—are not included in the analysis. We did not include fresh cranberries, all forms of lemons and limes, and dehydrated onions since they are more commonly used as a flavoring and are not usually consumed as a serving. We also excluded “specialty” products such as Portabello mushrooms, frozen shredded carrots, and any products labeled organic.

Some data limitations were related to using of the UPC code, where the descriptions were often so vague that many assumptions had to be made. For example, for some items, we assumed that the “regular” versions represented the plain version, such as canned mushrooms and sweet potatoes, whereas for other items additional descriptors were available. In addition, for some items, the description was too vague to be used, as when greens were described only as “greens.” Also, some fresh fruits and vegetables were measured in counts instead of pounds, and it was not always clear what that represented. Some items could not be reliably priced. For some items, such as grapes and bell peppers, it was not possible to separate out the different types (such as green or red), so all types had to be grouped together. Finally, time limitations prevented us from pricing dry beans, because of their enormous variety.

Where price appeared to differ among the same product, we separated out different cuts (whole, sliced, shredded, pieces). Juices were also differentiated by whether they were shelf-stable, refrigerated, or frozen. Including the different forms (fresh, canned, frozen, dried, and juice), the final sample included 85 vegetable items and 69 fruit items.

To estimate the price per pound, we divided the total weighted dollars spent for each item by the total weighted sales volume for each item. To estimate the price per serving, we used the Food and Nutrition Service's *Food Buying Guide for Child Nutrition Programs, 2000*, which provides

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information on the serving yield for most fruits and vegetables, in fresh or processed form. For example, according to the Guide, a pound of fresh pears yields 4.1 ½-cup servings of pear, a pound can of sliced green beans provides 8.2 ½-cup servings of drained green beans, and a 16-ounce container of frozen peaches provides 5.46 ¼-cup servings. We converted the Guide's servings to FGP-serving sizes (1 cup of raw, leafy vegetables; ½ cup of fresh, canned, or frozen fruits and vegetables; ¾ cup of juice; or ¼ cup of dried fruits or vegetables*). To estimate the price per serving, we divided the price per pound by the total number of servings per pound for the product. For example, the weighted-average retail price of fresh apricots was \$1.48 per pound and there are 5.95 ½-cup servings in each pound. Dividing \$1.48 by 5.95 results in a price per serving of 25 cents per serving for fresh apricots.

we then estimated a price per serving for each item. We refer to this price as the cost of *eating* fruits and vegetables.

All prices estimated for this report reflect national annual average prices for fresh and processed fruits and vegetables purchased at retail. The cost of fruits and vegetables consumed away from home—at restaurants or fast-food outlets, for example—is not included in the estimated prices. Furthermore, the estimated prices do not reflect the prices that any one individual paid for that particular fruit or vegetable. For example, where the item is purchased—a farmers' market versus a supermarket, or even what supermarket—will affect the price. Whether the item is on sale, whether the customer uses a coupon, and what brand the customer chooses will also affect the price. For fresh produce, in particular, seasonality is likely to have a large effect on both the price and the quantity purchased. In addition, economies of scale are often associated with purchasing larger containers, so that the per-pound cost of buying a 26-ounce can of tomatoes is usually lower than the per-pound cost of buying a 14.5-ounce can (as is the cost of eating a serving of said tomatoes). For this analysis, prices are averaged out throughout the year, across all types of retail outlets and package sizes and brands, yielding a weighted-average price.

*Note: Servings for fresh fruit are ½ cup even when the FGP servings are 1 piece of fruit. For collard greens, okra, and turnip greens, which are leafy vegetables, the FGP serving is 1 cup; the conversion factors for these vegetables is for ½ cup of cooked vegetable.

Table 1—Fruits and vegetables included in the study

Fruits		Vegetables		
Apples	Honeydew melon, fresh	Asparagus	Collard greens	Potatoes
Fresh	Kiwi fruit, fresh	Fresh	Fresh	Fresh
Canned ¹	Mangoes	Canned ⁵	Canned ⁶	Canned ⁶
Apples	Fresh	Cut/tips	Frozen ⁶	Frozen ⁶
Applesauce	Frozen ¹	Whole/spears	Corn, sweet	Dried ⁶
Juice ¹	Canned	Frozen ⁵	Fresh	Radishes, fresh
Shelf stable	Nectarines, fresh	Cut/tips	Canned, whole kernel ⁶	Spinach
Refrigerated	Oranges	Whole/spears	Frozen, whole kernel ⁶	Fresh
Frozen concentrate ²	Fresh	Beans, green	Cucumbers, fresh	Canned ⁶
Apricots	Canned, Mandarin ³	Fresh	Eggplant, fresh	Frozen ⁶
Fresh	Juice ¹	Canned ⁶	Kale	Squash
Canned ³	Shelf stable	Cut/sliced	Fresh	Fresh, zucchini
Dried	Refrigerated	Whole	Canned ⁶	Canned, summer ⁶
Avocados, fresh	Frozen concentrate ²	Frozen ⁶	Frozen ⁶	Frozen, zucchini ⁶
Bananas, fresh	Frozen, not concentrated	Cut/sliced	Lettuce, iceberg	Sweetpotatoes
Blackberries	Papayas	Whole	Lettuce, leaf⁷	Fresh
Fresh	Fresh	Beets, canned⁶	Lettuce, Romaine	Canned ⁵
Frozen ¹	Frozen ¹	Broccoli	Mushrooms⁸	Frozen ⁵
Canned	Canned	Fresh	Fresh	Tomatoes
Blueberries	Peaches	Whole	Whole	Fresh
Fresh	Fresh	Fleurets	Sliced	Regular sized
Frozen ¹	Frozen ¹	Frozen ⁶	Canned ⁵	Cherry/grape
Canned	Canned, Clingstone ³	Chopped/cut	Whole	Roma/plum
Cantaloupe, fresh	Pears	Spears	Sliced	Canned ⁶
Cherries	Fresh	Fleurets	Broken	Juice
Fresh	Canned ³	Brussels sprouts	Frozen ⁵	Turnip greens
Frozen ¹	Pineapple	Fresh	Mustard greens	Fresh
Tart	Fresh, whole	Canned ⁵	Fresh	Canned ⁵
Sweet	Canned ³	Cabbage, green	Canned ⁶	Frozen ⁶
Canned	Juice ^{1 4}	Fresh	Frozen ⁶	
Tart ³	Plums	Canned, sauerkraut ⁵	Okra	
Sweet	Fresh	Carrots	Fresh	
Cranberries, juice^{1 4}	Dried, prunes	Fresh	Canned ⁵	
Figs, dried	Juice ^{1 4}	Whole	Frozen ⁶	
Grapefruit	Raspberries	Baby	Onions	
Fresh	Fresh	Canned ⁶	Fresh	
Canned ³	Frozen ¹	Sliced/cut	Canned ⁵	
Juice ¹	Canned	Whole/other	Frozen, pearl ⁶	
Shelf stable	Strawberries	Frozen ⁶	Peas, green	
Refrigerated	Fresh	Cauliflower	Fresh	
Frozen concentrate ²	Frozen ¹	Fresh	Canned ⁶	
Grapes	Canned	Whole	Frozen ⁶	
Fresh	Tangelos, fresh	Fleurets	Peppers, bell, fresh	
Dried, raisins	Tangerines, fresh	Frozen ⁶		
Juice ¹	Watermelon, fresh	Fleurets		
Shelf stable		Cut		
Frozen concentrate ²		Celery, fresh		

¹ Unflavored/unsweetened.

² Reconstituted.

³ Packed in juice/water.

⁴ Shelf stable.

⁵ Regular type.

⁶ Plain.

⁷ Red and green leaf lettuce.

⁸ Excludes "specialty" types of mushrooms, like Portobello and Shitake.