A Quarterly Food-at-Home Price Database for the U.S.

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Presented at the 2009 Pre-Conference Workshop, August 16, 2009, Diet and Obesity: Role of Prices and Policies

August 2009

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Abstract

This report provides a detailed description of the methodology used to construct ERS's Quarterly Food-at-Home Price Database (Q-FAHPD). As the name suggest, these data provide quarterly observations on the mean price of 52 food categories for specific U.S. markets. We provide a description of the Nielsen Homescan data that was used to create this database, the methodology used to classify foods into food groups, how we determined the appropriate the level of aggregation (sub-regional markets) and our calculation of average prices for each food group. This report also contains an overview and summary of the resulting data.

Keywords: Nielsen Homescan, food prices, diet quality, market prices

Acknowledgements: Jimmy Zhou assisted with data cleaning and sorting in early stages of the project.

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Quarterly Food-at-Home Price Database Methodology Report

Summary

This report describes the data and methodology used to create the ERS Quarterly Food-at-Home Price data for 2006. Using purchasing records from the 2006 Nielsen Homescan data, we create 52 separate food categories and calculate the quarterly average price-per-gram for 24 sub-regional markets for each food category. The food categories were created to correspond with the US Department of Health and Human Services (USDHHS) and US Department of Agriculture (USDA) *Dietary Guidelines* as well as capture additional convenience premiums. This same methodology will be applied to the 2002-2005 Nielsen Homescan data to support research on the economic determinants of diet quality and health outcomes.

What Is the Issue?

Food prices are crucial for economic modeling of consumer food choice and dietary patterns. Many argue that an increase in the relative cost healthy foods has contributed to the recent increase in overweight and obesity. However, the lack of data on relevant food prices has made it difficult to assess the possible extent to which prices limit access to a healthy diet. This lack of price data also makes it difficult to analyze the potential impact of policies that would alter the relative cost of foods—possibly through taxes or subsidies—to encourage healthier food choices.

What are the Major Findings?

The newly constructed Quarterly Food-at-Home Price Database demonstrates that food prices vary widely across geographic areas. In the first quarter of 2006, the relative price difference within food group between the lowest and highest markets ranged from 26 percent (for canned

soups and sauces) to over 100 percent (for whole and not whole grain flour and mixes, oils, sugar and sweeteners). This variation is 5 to 20 times greater than annual food price inflation. In addition, we find that in most cases, nutritional quality affects food prices, but the premium for healthier alternatives varies across markets. For example, whole grain products are always more expensive than refined grains, but the premium ranges between 9 and 62 percent.

How Was the Study Conducted?

We use the Neilsen Homescan data to construct the Quarterly Food-at-Home Price Database (Q-FAHPD). To balance the need for coverage against tractability, we grouped foods into 52 separate categories based on the 2005 Dietary Guidelines and other factors relevant for food shopping and preparation. Prices are constructed for each food group for a total of 26 markets and 9 non-metro census divisions. The database currently includes quarterly prices for 2004 through 2006, with years 2002 and 2003 to be added later.

Quarterly Food-at-Home Price Database Methodology Report

Introduction: Why we need another data set

The majority of Americans do not meet the USDA 2005 Dietary Guidelines (DGs), consuming too few fruits and vegetables and too much sodium, fat and added sugars (Guenther et al 2007). These same dietary patterns have been associated with adverse healthy outcomes such as Type II diabetes, obesity, coronary heart disease and certain kinds of cancer. As such, there is keen interest in identifying options to improve the quality of the American diet. And while food prices are crucial for economic modeling of consumer food choice and dietary patterns, research on individual food consumption has been limited by the unavailability of exogenous, relevant food prices. Lack of price data, for example, makes it difficult to analyze the potential impact of policies that would alter the relative cost of foods—possibly through taxes or subsidies—to encourage closer compliance with dietary recommendations. The lack of price data also makes it difficult to assess the possible extent to which prices limit access to a healthy diet.

Previous research has shown that it is possible to afford a healthy diet on a limited budget. Reed et al. (2004) calculate the per-serving cost for numerous specific fruits and vegetables, finding that the cost to meet dietary recommendations of these foods averages around 64 cents per day. Carlson et al (2007) developed the 2006 Thrifty Food Plan to demonstrate how to obtain a diet that conforms to dietary recommendations using the maximum food stamp allotment. However, these reports only calculate prices for one or two years, do not allow for variation across seasons or regions nor do they provide similar price estimates for other, possibly less healthful foods. Thus, these studies do not provide insight into whether prices vary across the country or whether healthy foods are relatively more expensive than unhealthy foods.

Changes in relative prices over time and over seasons have also been cited as possible contributor to the recent increase in overweight and obesity. This highlights the importance of tracking price changes over time. In this vein, Kuchler and Stewart (2008) compared inflation-adjusted trends in the price of 11 fruits and vegetables to four less healthy foods using monthly BLS city average price data. The foods examined were limited to those with uninterrupted price data across the period examined, 1980 – 2006. They find that the relative prices of the selected healthy foods have not changed over the period, as prices of both types of foods have fallen similarly. They conclude that changes in relative prices are not an important factor in the increasing prevalence of overweight and obesity. However, the study examined national mean prices, so the role of regional or market-level variation was not explored. Moreover, the study was limited to a few select fruits, vegetables and other foods, making inference about the general trend in the price of healthy to unhealthy foods difficult.

Varying market conditions show the importance of measuring food prices at the local or regional level, in addition to the national level. Previous research has shown that food prices are likely to vary by proximity to point of production, the types of food outlets in the area, and socio-demographic characteristics of the community, such as income. Volpe and Lavoie (2008) find that the proximity of a Walmart Supercenter is associated with lower food prices at nearby supermarkets by as much as 7 percent. In addition, they find that supermarkets adjust the prices of private label (store brand) products depending on the demographic characteristics of consumers in the area surrounding the store and other market conditions. Club stores (e.g. Costco, Sam's Club) offer lower unit prices for many foods purchased in bulk, but not all localities have access to such stores. Hausman and Leibtag (2007) show that as spending at

supercenter, mass merchandiser, or warehouse club stores increases, average price paid decreases.

Local and seasonal variations in prices highlight the importance of measuring localized time-varying prices for a broad array of foods. Linking this dataset to existing nationally representative surveys on dietary patterns or health outcomes could then support research addressing possible economic barriers to healthy diets and related health outcomes. In that vein, we use Neilsen Homescan data to construct the Quarterly Food-at-Home Price Database (Q-FAHPD). As the name suggests, it contains prices for food at home that are specific to a market, sub-regional area or non-metro census division. To balance the need for coverage against tractability, we grouped foods into 52 separate categories based on the 2005 Dietary Guidelines and other factors relevant for food shopping and preparation.

This report provides a detailed description of the methodology used to construct this database. We begin with a summary of existing, alternative food price data and their limitations. This is followed by a description of the Nielsen Homescan data and its relative strengths for this project. We describe the criteria used to separate foods into specific categories, the process we used to determine the appropriate the level of market aggregation and our calculation of average prices for each food group. We conclude with an overview and summary of the resulting data.

Alternative Price Databases--Why we need to make our own

There are existing food price datasets that can be disaggregated beyond the national level. These include the Bureau of Labor Statistics (BLS) average price data, the Council for

Community and Economic Research (C2ER, formerly known as ACCRA) price data and commercial store-based scanner data such as Nielsen's Scantrak or IRI's Infoscan. Each source has its strengths, but none have all of the properties needed for this project, specifically, frequent nationally representative observations over time on a large number of foods from a variety of outlets. For example, as part of its calculation of the Consumer Price Index, the BLS collects average price data using rigorous sampling procedures for a limited number of food products.[1] However, these prices are only available at the national and broad regional level-- Northeast, Midwest, South, and West. Researchers have shown that these limitations may bias estimates of food prices. Hausman and Leibtag (2007) show that the methodology BLS uses to calculate the food CPI may overestimate the price of food, especially in areas with Walmart Supercenters, as lower prices observed at the supercenters and other nontraditional retail outlets are not fully captured when consumers shift more of their food spending to these lower-priced outlets.

The C2ER price database has broader geographic coverage, but includes fewer foods than the BLS data. C2ER data are used to make cross-market comparisons of the cost of living by pricing a number of consumer goods each quarter in over 300 metropolitan areas across the U.S. The prices collected include 24 food-at-home (grocery store) items and 3 food-away-from-home (restaurant) items. Within each market area, price collectors are instructed to select grocery stores that individuals from professional and managerial households would normally shop (defined as households with incomes in the upper quintile of the local distribution) and to collect prices from these stores each quarter.[2] However, there is little detail on the sampling frame used to collect these data, which leaves questions about the representation and coverage. There are

[1] For the full list of food prices collected by BLS, see the BLS website at http://data.bls.gov/PDQ/outside.jsp?survey=ap.
[2] For more information on the C2ER methodology, see their COLI report at http://www.coli.org/surveyforms/colimanual.pdf .

also some challenges in using these data for time series analysis since they were designed for cross-sectional analysis only (Sturm and Datar, 2005).

Store-based scanner data, such as Nielsen Scantrak, provide records of weekly dollar sales and units sold of all Universal Product Code (UPC) transactions at participating grocery stores. Average weekly prices can be calculated for selected UPCs, as well as broader food categories, by dividing the dollar sales volume by the number of units sold. Thus, the prices reflect the transaction-weighted average of all purchases made, regardless of whether the purchase was at the full or a discounted price and/or the consumer used a coupon.

One shortcoming of standard store-based scanner data is that foods without UPC codes, such as some fresh fruits and vegetables, baked goods and deli items, are not included. Also, these data do not include price data from warehouse club or discount supercenter stores such as Walmart and Costco. The omission of non-UPC coded foods and supercenter purchases may put a significant upward bias on price estimates. A comparison of U.S. egg prices over time among the four food price datasets-- BLS average price data; C2ER; Nielsen Scantrak; and Nielsen Homescan-- shows that while all four datasets show similar trends in the price of eggs over time, the price estimates from Nielsen Homescan data are always lowest (Leibtag, 2008).

Nielsen Homescan data--The core data for this project

The Nielsen Homescan data consist of about 40,000 representative U.S. households per year and include purchase and demographic information for each household in the sample. All households report their UPC-coded transactions over the year(s) that they participate in the panel

from all outlet channels, including grocery, drug, mass-merchandise, club, supercenter, and convenience stores. A subset of the panel (the Fresh Foods panel, which contains about 8,000 households per year) also report their random-weight (non-UPC coded) food purchases from the same channels.

Nielsen calculates household-level weights to make the panel demographically balanced to match the U.S. population as closely as possible at the market, regional and national level using census demographic information for each geographic area.[3] For each food item purchased, the data include date of purchase, item description, number of units purchased, price paid, and any promotional prices or coupon savings. For purchases made in stores tracked by Nielsen Scantrak, the price recorded is the store-level weighted mean price for the purchases of the item that week, while for non-Scantrack stores, panelists report the price paid directly.[4]

Previous research and alternative food classification strategies

Previous research on the relationship between food prices and diet and weight outcomes has used only limited price data. For example, Chou et al (2004) looks at the effect of the prices at full-service and fast-food restaurants and a price index for food requiring preparation (food at home) on adult obesity. They obtain the full-service restaurant price from the Census of Retail Trade and the latter two prices from the C2ER Cost of Living Index. The price index for food at home is constructed from the prices of only 13 specific food items.

[3] See Muth et al. (2007) for a more complete description of the Nielsen sampling design and weighting system.
[4] For more details of the impact of this two-tiered price reporting system, see Einav, Leibtag, Nevo (2008).

Gelbach et al (2007) examines how the relative cost of healthful to unhealthful foods affects obesity among adults. They classify 44 individual foods, priced by BLS, as either healthful or unhealthful, but do not provide any justification for how the foods are divided. This lack of detail leads to some questionable groupings. For example, whole milk, soda crackers and jelly are classified as healthful, while peanut butter is considered unhealthful. The majority of the foods classified as healthful are fruits and vegetables, but many of these have relatively low nutritional value or make up a very small proportion of overall consumption or recommended daily intake (e.g. cucumbers, celery, mushrooms, radishes, iceberg lettuce, lemons, and grapefruit). Each food item is weighted equally to comprise the total price index within each category.

Sturm and Datar (2005) use prices of 16 foods from C2ER to construct prices for three at home food groups (meat; fruits and vegetables; and dairy) as well as one price for food away from home. The price of each at-home food group is a weighted average of each individual food, in which the weights are the share of the consumer basket in the food group, while the food-away-from-home price is a simple mean of the price for three fast food meals. The prices for each group are then normalized by the average for all areas, and then by the cost of living in each MSA. It is unclear how the share of the consumer basket for each food was determined.

In calculating the Thrifty Food Plan, the Center for Nutrition Policy and Promotion (CNPP) develop a detailed database of food prices using the Nielsen Homescan data that can be linked to food consumption reported in the 2001-02 National Health and Nutrition Examination Survey (NHANES). Details about the database and its construction are documented by Carlson et al (2008). In sum, CNPP calculate a national average price for each specific food reported consumed in the NHANES. The CNPP price database provides detailed information about the

average cost of meals individuals consume, but it does not provide information about the cost of alternatives, nor are the prices specific to regions or localities. As we described earlier, food prices are likely to vary across markets. The price of substitutes and complements to the foods selected may also be important determinants of individuals' food consumption.

Our food classification strategy—why we did what we did

To support research on the economic determinants of diet quality and adherence to dietary recommendations, we had two main considerations when determining how to group foods: USDA dietary guidelines (DGs) (USDA and DHHS, 2005) and convenience premiums. The first cut in categorizing foods in the Nielsen data was based on the seven main food groups identified in the DGs: grains, vegetables, fruits, milk, meat and beans, oils and discretionary calories. Each major grouping is further subdivided into the specific form recommended by the DGs. For example, individuals are encouraged to ensure that at least half of their grains are whole grains. Thus, whole grains are separated from all other grains. The guidelines also distinguish between whole fruits and fruit juices, thus fruit juices are separated from whole fruits. In addition, individuals are encouraged to choose low fat dairy products over the regular versions. Following the Food and Drug Administration (FDA) low fat labeling requirement, we classify dairy products as low fat if they contain 1 percent or less milk fat.

The DGs distinguish dark green and orange vegetables and legumes from other vegetables. Moreover, the Dietary Guidelines encourage the consumption of a variety of vegetables, identifying five main groups of vegetables: dark green; orange; dry beans and peas; starchy vegetables; and other vegetables. After consulting with a USDA nutritionist, we further

divided the other vegetables category into two groups--those listed in the DGs as a source of nine selected nutrients and those that are not listed (Table 1). The idea is to distinguish vegetables that can help meet dietary needs of key nutrients from those with less nutritional qualities. Legumes are also identified as foods appropriate for meeting recommendations for meat and beans, giving another reason for pricing them separately from the dark green and orange vegetables.

< table 1 about here >

As for protein sources (the meat and bean category), the DGs encourage the selection of lean cuts of meat as well as higher consumption of fish, nuts and seeds over meat and poultry. Meat and other protein sources are classified into the five groups identified in the recommendations for this category: meat; poultry; fish; nuts and seeds; and eggs. The sixth group identified in this category is legumes, which were already identified a separate category for vegetables. Meat is further divided into low fat and regular cuts. Again following FDA requirements, low fat meats are those that can be labeled as fat free, low fat, lean or extra lean (Table 2).

< table 2 about here >

Discretionary calories are identified as the additional calories in foods coming from the addition of fat, sugar or alcohol. Because the DGs distinguish between oils and solid fats, our classification also follows this breakdown of fats. We include a single category for sugars and sweeteners and three separate categories for beverages—water; carbonated non-alcoholic drinks and sugar sweetened beverages such as fruit drinks and powerades.

The Dietary Guidelines also recommend limiting intake of total fat, added sugars and sodium. Often, these nutrients are added in food processing. Fruits canned in syrup contain added sugars, canned meats and vegetables often have added sodium and processed nuts (such as peanut butter) usually include both added sugars and sodium. This motivates a further breakdown of fruits, vegetables and meats into canned versus fresh or frozen and the distinction between raw and processed nut products.

Many foods purchased for consumption at home are in forms that reduce the preparation time required for consumption. Canned soups, frozen entrees and many rice dishes are packaged ready to heat. Many other foods, such as cookies, chips, and deli items are packaged ready to eat. These foods are often composed of several ingredient, making it difficult to separate them items into the distinct categories described above. Thus convenience items and commercially prepared composite foods are grouped separately from primary food items. The final 52 food groups are summarized in Table 3.

< table 3 about here >

Calculating average prices—How we did what we did

The Nielsen Homescan data provide detailed information about each food purchase, including the number of units or packages, the total weight and total amount paid. Using this information, we calculate the unit value per 100 grams for each purchase of each food. However, in some cases, only the number of items purchased (e.g. ears of corn) are reported. In these cases, we convert the unit counts to weight using the USDA National Nutrient Database for Standard

Reference, Release 20.[5] Within each market, the unit values are aggregated to provide an estimate of the quarterly mean market price per unit. Each quarter contains 13 weeks of purchase data.

We aggregated the purchase data by first constructing the average household quarterly prices within each food group first, and then taking the weighted mean of the household means for each market. This is consistent with how Nielsen constructed the household weights and intended the data to be used.

Nielsen only collects random-weight purchases from the Fresh Foods panel, which makes up roughly 20 percent of the total Homescan panel. Thus, only a subset of the full panel reports purchases of random-weight (non-UPC coded) foods. Since these random-weight purchases make up a large share of purchases in some food groups (especially fruits and vegetables and fresh meat items), we are missing purchase data for a large share of some food groups for many households in the data. One possible solution to this problem of unobserved non-UPC food purchases is to ignore all random weight purchases and use only UPC-coded purchases to construct our market prices. However, as Table 4 shows for fruit and vegetables, the mean price of random-weight foods is lower than that for UPC-coded foods. This is probably due to the fact that UPC-coded products include convenience and packaging premiums, such as pre-washed, pre-cut or frozen forms of produce, while random-weight products are usually fresh, unprocessed items. Thus, ignoring the random-weight purchases could overestimate the mean price of each fruit and vegetable group, the magnitude of the bias determined by the share of purchases in each

[5] Although it was possible to convert most unit counts to gram weights using this approach, not all purchases reported only as counts were convertible. The details of purchases that were not convertible are documented in the Appendix.

group that are not UPC-coded. The prices of meat, poultry and fish would be similarly affected if the price of UPC-coded products also differs from random-weight products.

< table 4 about here >

In the interest of utilizing all available purchase data and reducing bias in our market prices, we used a weighted average price for each food group with the weights adjusted for the sample of UPC-only and Fresh Foods (UPC and non-UPC reporting) panelists for each food group. More formally, for fresh fruits, fresh vegetables, deli meats, deli cheese, bakery and other ready-to eat deli items, we coded food purchases to the price of each food group *k* random-weight purchases as an expenditure share weighted mean for each market *i* in each quarter *q*:

$$\overline{p}_{i,k,q} = s^{upc}_{k,i,FF} \frac{\sum_{j=1}^{n} hh_j \, p^{upc}{}_{k,j,q}}{\sum_{j=1}^{n} hh_{j,q}} + s^{rw}_{k,i,FF} \frac{\sum_{j=1}^{m} hh_j \, p^{rw}{}_{k,j,q}}{\sum_{j=1}^{m} hh_{j,q}} \qquad (1)$$

where $s^{upc}_{k,i,FF}$ is the share of household expenditures on the food group on UPC-coded products by Fresh Foods (FF) Panel households, $s^{rw}_{k,i,FF}$ is the share of household expenditures on non-UPC coded products by Fresh Foods Panel households, on food group in market *i*, hh_j is the household weight, $p^{upc}{}_{k,j,q}$ is the average price paid on UPC-coded foods in food group *k* by household *j* in quarter *q*, and $p^{rw}{}_{k,j,q}$ is the average household price paid on random weight foods in food group *k* by household *j* in quarter *q*, and *m* is the number of Fresh Foods Panel households and *n* is the total number of households in the panel (including Fresh Foods households). Note that within each market, equation (1) assumes that the average price and expenditure share of random-weight items in each food group among the Fresh Foods panelists

represents what would be observed among the full panel of households if the full panel also reported their random-weight purchases. This assumption is supported by our finding that there were no significant differences in purchasing behavior between the Fresh Foods panel and the remaining Homescan panel with respect to UPC coded foods. Specifically, we tested whether the mean household price paid and mean household expenditure on UPC purchases of fruits and vegetables was significantly different for the Fresh Foods households and found no significant differences (results available upon request).

Defining markets

Nielsen identifies 52 markets and four additional non-metro regions in the data. Our goal is to construct prices for as many localized markets as possible; however, the sample size of Fresh Foods households is too small in some of the Nielsen-identified markets to provide reliable estimates of the expenditure shares (or prices for random-weight items) for each food group that includes random-weight purchases. We therefore aggregate the 52 markets geographically into groups such that the Fresh Foods sample contains at least 30 households in each quarter and that differences between the Fresh Foods sample and remaining Homescan sample for average price and expenditures on UPC-coded products are minimized (Table 5). Given the large sample sizes in the four non-metro regions, we divide these regions into nine non-metro census divisions.

< table 5 about here >

One concern about the aggregation method used to construct the market level prices is that differences in the quality of food items will not be distinguishable from differences in

market prices. If demographic characteristics (which are assumed to at least partially determine preferences for food) differ across markets, differences in the average prices paid across markets may be partly attributable to the differences in demographics/preferences. Before considering how differences in quality may affect our average price calculations, it is important to consider what is meant by quality.

Quality can refer to any attribute of a food item that incurs an increase in unit cost. The attributes can reflect categorical differences in the item (type of fruit or vegetable, cuts of beef, species of fish), the processing or convenience (pre-cut melons and vegetables, grated cheese or ready to cook entrees), packaging (single-serving vs. family size), brand (national vs. store) or production methods (organic vs. conventional). In addition, the choice of outlet may affect the unit cost of food as different outlet types may face different operating costs and therefore have different mark-ups over wholesale prices.

Classifying foods into particular subgroups addresses the issue of quality in part by separating higher priced forms of foods from lower priced alternatives (for example, fresh/frozen vs. canned vegetables, or raw ingredients from packaged/prepared versions). However, within each food group, it is possible that low-income households purchase different products, face different prices or have different levels of access than households with higher income. If the variation in prices faced by low income households is similar to the variation in prices faced by higher income households, it may be reasonable to assume that patterns that hold for the whole sample would also hold for the low-income households in the sample.

We test whether the variation in prices of specific food groups across markets is affected by the sample composition. First, markets are constructed so that there is sufficient sample size

of low income households (income less than 185% of the Federal poverty line). Mean market prices are constructed as in equation 1 for both the full sample in each market and the low income sample in each market for fruit and vegetable food groups. Prices in each market are normalized by the national mean price for each sample to construct a price index for the food group. However, both the market basket and the expenditure shares on UPC-coded and random weight purchases are allowed to vary across markets and across samples. When the markets are ranked by the price index in each group, we consistently see the most expensive markets as determined by the full sample also appearing as the most expensive markets in the low income sample, and the same pattern holds for the least expensive markets, as well (results available upon request). Thus, the relative price differences across markets hold regardless of the sample we select. Although we recognize that within each market the average price paid by low income households is lower than that paid by households with higher income,[6] we leave an investigation into the determinants of the price differences across income levels within each market for further study.

Summary of 2006 price data –what we found

One of the main motivations for constructing this food-at-home price database is the expectation that there is likely to be large variation in food prices across markets. When only prices for larger geographical areas are available, estimates of the effect of food prices on food choices or health outcomes will be attenuated due to this measurement error of food prices in more localized markets. Although we cannot perfectly capture or measure a local food price with the existing

[6] For additional discussion of the issue of differences in prices paid for food by different income groups, see Broda, Leibtag, Weinstein (2009).

data, the market prices we have constructed should offer an improvement over more aggregate prices (such as at the national or regional level). Of course, the extent to which prices measured for smaller geographic units improve upon more aggregate price measures will depend on the extent to which the market prices vary within the larger geographic areas.

To explore this, we examine the mean market price and the variation of prices across markets using the coefficient of variation within each of the nine Census Divisions for each of the 52 food groups. Specifically, we first calculate the simple annual mean price per 100 grams within each market and then take the simple average of all markets within each Census Division. To compare variability within Census Divisions, we look at the coefficient of variation of the annual market prices (tables 6, B1- B6). The coefficient of variation is calculated as standard deviation relative to its mean price. It provides a measure of market dispersion that also allow for comparison across food categories because it is independent of the variable's measurement unit.

Looking first at the three fruit groups (Table 6), we see that fresh and frozen fruit are more expensive than fruit juice, which is more expensive than canned fruit. We also see that across divisions, the range in mean prices as measured by the ratio of the highest to lowest mean is ranked similarly (fresh and frozen fruit = 1.34; fruit juice = 1.27 and canned fruit = 1.19). However, it is not necessarily the case that the division with the highest mean price also has the highest variation across markets (and visa versa for the lowest mean price). In fact, in the case of fresh and frozen fruit, the division with the lowest mean market price (West North Central) has the greatest variability in market prices (cv = 0.166). Generally, the range in variation within divisions is greater than the range in mean prices across divisions. For fresh and frozen fruit, the ratio of the highest coefficient of variation to the lowest is 23.7, more than 20 times the range in

mean prices. The remaining food groups are summarized similarly in tables B1 – B6 in Appendix B.

< table 6 about here >

We also calculate the same measures for even broader geographic areas, the four Census Regions (tables B7 – B10 in Appendix B). In the case of the fruit groups, the range in mean regional prices is lower than that observed across the nine regions, but there is less variability in the within-region variation of market prices (table B7). This is mainly due to the fact that there are no regions with extremely low coefficients of variation, implying that regional prices are even poorer measures of local food prices.

Figures 1 – 6 plot the 35 first quarter market prices, ranked from lowest to highest, for each food group.[7] Since the markets are ranked by price in each food group, we cannot compare the price differences across food groups within a given market. However, the figures do provide a rough approximation of the general differences in price across food groups within a broader food category (such as fruit, or vegetables). Many of the patterns apparent in the tables are also apparent in the figures. We see that fresh and frozen vegetables are generally more expensive than their canned counterparts, whole grains are more expensive than refined grains, and low fat dairy products are less expensive than the full fat versions. However, the premiums paid for the healthier alternatives in each broad food category are not constant across markets (figures 7 – 10). While dark green vegetables are generally more expensive than the more commonly consumed starchy vegetables (e.g. corn, potatoes), the premium is much higher in some markets

[7] Only a selection of the commercially prepared food groups are included for clarity of presentation. Beverages other than fruit juice are also excluded from the figures, as are sugar and sweeteners.

than in others (figure 7). We also see that the discount for low fat milk is lower in some markets than in others (figure 8).

< figures 1 – 10 about here >

Concluding discussion--So what?

The Quarterly Food-at-Home Price Database demonstrates that food prices vary widely across geographic areas. In the first quarter of 2006, the highest priced market was between 26 (canned soups and sauces) and over 100 percent (whole and not whole grain flour and mixes, oils, sugar and sweeteners) higher than the lowest market price within a food group. In contrast, food price inflation in the U.S. averaged just 3 percent per year over the past twenty years, and even fresh fruit and vegetable prices, which generally exhibit greater inflation rates than other food categories, averaged less than 5 percent inflation per year (table 7). The 5 to 20 times greater price variation across markets as compared to the price variation over time suggests that research investigating the determinants of cross-market price variation deserves greater attention, or at least as much focus as the determinants of price change over time.

In addition, we find that in most cases, nutritional quality affects food prices, but the premium for healthier alternatives varies across markets. For example, whole grain products are always more expensive than refined grains, but the premium ranges between 9 and 62 percent. However, healthier options are not always more expensive. Low fat milk is anywhere from 19 to 113 percent less expensive than other forms of milk, but in this case, differences in cost based on the fat content of a given milk product most likely explain this exception to the rule. Nonetheless, the overall trend of higher costs for higher nutritional quality food products warrants future research into the factors that lead to these price premiums (cost differences?,

demand differences?) and how these differences affect food choice and ultimately, diet quality. This database should help facilitate these endeavors.

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Tables and Figures

Table 1. Classification of Vegetables with examples in each category.

Dark green	**Starchy vegetables**
bok choy	corn
Broccoli	green peas
collard greens	lima beans (green)
dark green leafy lettuce	potatoes
Kale	
Mesclun	
mustard greens	
romaine lettuce	**Other vegetables (source of select nutrients)**
Spinach	artichokes
turnip greens	avocado
Watercress	Brussels sprouts
	cabbage
Orange vegetables	cauliflower
acorn squash	green or red peppers
butternut squash	Okra
Carrots	parsnips
hubbard squash	tomatoes
Pumpkin	
Sweet potatoes	
	Other vegetables
Dry beans and peas	asparagus
black beans	bean sprouts
black-eyed peas	celery
garbanzo beans (chickpeas)	cucumbers
kidney beans	eggplant
Lentils	green beans
lima beans (mature)	iceberg (head) lettuce
navy beans	onions
pinto beans	mushrooms
soy beans	beets
split peas	zucchini
tofu (bean curd made from soybeans)	turnips
white beans	wax beans

Source: USDA My Pyramid, Inside the Pyramid (http://www.mypyramid.gov/pyramid/vegetables.html) and authors' separation of other vegetables.

Table 2. Definitions for various low fat description labels.

Label (synonyms)	Definition
Fat free (without fat, no fat, zero fat)	< 0.5 g of fat per serving
Low fat	<=3g fat per 100g and no more than 30% of calories from fat <=1g saturated fat per 100g and no more than 10% calories from saturated fat <=20 mg cholesterol per 100g and <=2g saturated fat per 100g
Lean	<10g fat (and <4g saturated fat) per serving and per 100g
Extra lean	<5g fat (and <2g saturated fat) per serving and per 100g
--% Fat free	90% fat free = lean, 95% fat free = extra lean

Source: "A Little 'Lite' Reading" (http://www.fda.gov/Fdac/special/foodlabel/lite.html)

Table 3. Food Groups and sub groups.

Primary category	Sub1	Sub2	Food group
Fruits	Whole	Fresh/Frozen	1
		Canned	2
	Fruit juice		3
Vegetables	Dark Green	Fresh/Frozen	4
		Canned	5
	Orange	Fresh/Frozen	6
		Canned	7
	Starchy	Fresh/Frozen	8
		Canned	9
	Other-nutrient dense	Fresh/Frozen	10
		Canned	11
	Other-mostly water	Fresh/Frozen	12
		Canned	13
	Legumes	Fresh//Frozen/Dried	14
		Canned/Processed	15
Grains	Whole grain	Packaged (bread, rolls, pita, tortilla, rice, pasta, cereal))	16
		Flour and mixes	17
		Frozen/Ready to cook	18
	Not whole	Packaged (bread, rolls, pita, tortilla, rice, pasta, cereal))	19
		Flour and mixes	20
		Frozen/Ready to cook	21
Dairy	Low fat	Milk	22
		Cheese	23
		Yogurt & other	24
	Regular Fat	Milk	25
		Cheese	26
		Yogurt & other	27
Meats	Low Fat Meat	Fresh/Frozen	28
	Regular Meat	Fresh/Frozen	29
		Canned	30
	Poultry	Fresh/Frozen	31
		Canned	32
	Fish	Fresh/Frozen	33
		Canned	34
	Nuts and Seeds	Raw	35
		Processed/nut butters	36
	Eggs		37
Fats and Oils	Oils		38
	Solids		39
Sugar and sweetners	Raw		40
Beverages	Carbonated non alchololic		41
	Fruit drinks and other non-carbonated sugary beverages		42

	Water		43
Commercially prepared items	Sweet	Frozen (ice cream, frozen desserts)	44
		Mixes (pancake, muffin and cake mixes)	45
		Packaged (cookies, candy bars, bars)	46
		Ready-to-eat (bakery items)	47
	Not sweet	Frozen (pizzas, pizza rolls, french fries, breaded veggies, fish sticks and entrees)	48
		Canned (soups, sauces, etc)	49
		Packaged/Snacks	50
		Packaged/Meals and sides	51
		Ready-to-eat (hot and cold deli items)	52

Table 4. National average prices (per 100 grams) for fresh/frozen fruit and vegetables, UPC-coded and non-UPC coded, 2006 Nielsen Homescan data.

	UPC-coded	non-UPC coded	p-value
Dark Green	0.391	0.281	0.000
Orange	0.274	0.173	0.000
Starchy	0.244	0.208	0.000
Other - Select Nutrients	0.547	0.325	0.000
All other Vegetables	0.376	0.235	0.000
Fruit	0.455	0.225	0.000

Table 5. Summary of Regions, Divisions and Market Groups.

Region	Division	Market Group (Nielsen-identified Markets)
East	New England	Hartford
		Boston
		Nonmetro New England
	Middle Atlantic	Urban NY
		Western NY/PA (Pittsburg, Buffalo, Albany, Syracuse)
		Philadelphia
		Other NY (Suburban, Exurban)
		Nonmetro Middle Atlantic
Central	East North Central	East North Central 1 (Indianapolis, Detroit, Milwauke, Grand Rapids)
		Chicago
		East North Central 2 (Cincinnati, Cleveland, Columbus)
		Nonmetro East North Central
	West North Central	West North Central
		Nonmetro West North Central
South	South Atlantic	North Florida (Jacksonville, Orlando)
		North South Atlantic (Raleigh-Durham, Charlotte, Richmond)
		Baltimore
		South Florida (Miami, Tampa)
		Atlanta
		Washington, DC
		Nonmetro South Atlantic
	East South Central	East South Central (Nashville, Birmingham, Memphis, Louisville)
		Nonmetro East South Central
	West South Central	West South Central 1 (Little Rock, Oklahoma City-Tulsa)
		San Antonio
		West South Central 2 (Houston, Dallas, New Orleans)
		Nonmetro West South Central
West	Mountain	Mountain (Denver, Phoenix)
		Salt Lake City
		Nonmetro Mountain
	Pacific	South Pacific (San Diego, Sacramento)
		Los Angeles
		North Pacific (Seattle, Portland)
		San Francisco
		Nonmetro Pacific

Note: see the map produced by the U.S. Census Bureau detailing the location of states within Divisions accessible at http://www.census.gov/geo/www/us_regdiv.pdf.

Table 6. Annual mean prices per 100 grams ($) and coefficients of variation, Fruit groups, by Census Division, 2006.

Food Group	Division								
	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	
Fresh/Frozen fruit	0.359	0.312	0.276	0.268	0.313	0.273	0.277	0.290	
	(0.099)	(0.064)	(0.060)	(0.166)	(0.070)	(0.007)	(0.086)	(0.087)	(
Canned Fruit	0.306	0.290	0.272	0.258	0.287	0.256	0.266	0.283	
	(0.065)	(0.138)	(0.050)	(0.009)	(0.022)	(0.026)	(0.035)	(0.081)	(
Fruit Juice	0.184	0.173	0.182	0.196	0.185	0.175	0.185	0.211	
	(0.086)	(0.029)	(0.015)	(0.006)	(0.072)	(0.067)	(0.036)	(0.028)	(

Note: Division annual mean price is calculated as the mean of annual market group mean prices in each Division. Annual market mean prices are the simple mean of the mean price in each of the four quarters in each market group. Coefficient of variation in parentheses.

Table 7. Average annual U.S. food price inflation, 1989-2008.

Food Group	Avearge Annual Inflation (%)
All Food	3.0
Food away from Home	2.9
Food at Home	3.1
Beef	3.5
Pork	2.6
Poultry	2.6
Fish	2.7
Eggs	5.0
Dairy	3.4
Fats and Oils	2.9
Cereal and Bakery Products	3.6
Fresh Fruits	4.6
Fresh Vegetables	4.5
Processed Fruits and Vegetables	2.9
Nonalcoholic Beverages	2.0

Source: ERS calculations using BLS-CPI data.

Figure 1. Price of Fruit groups by market.

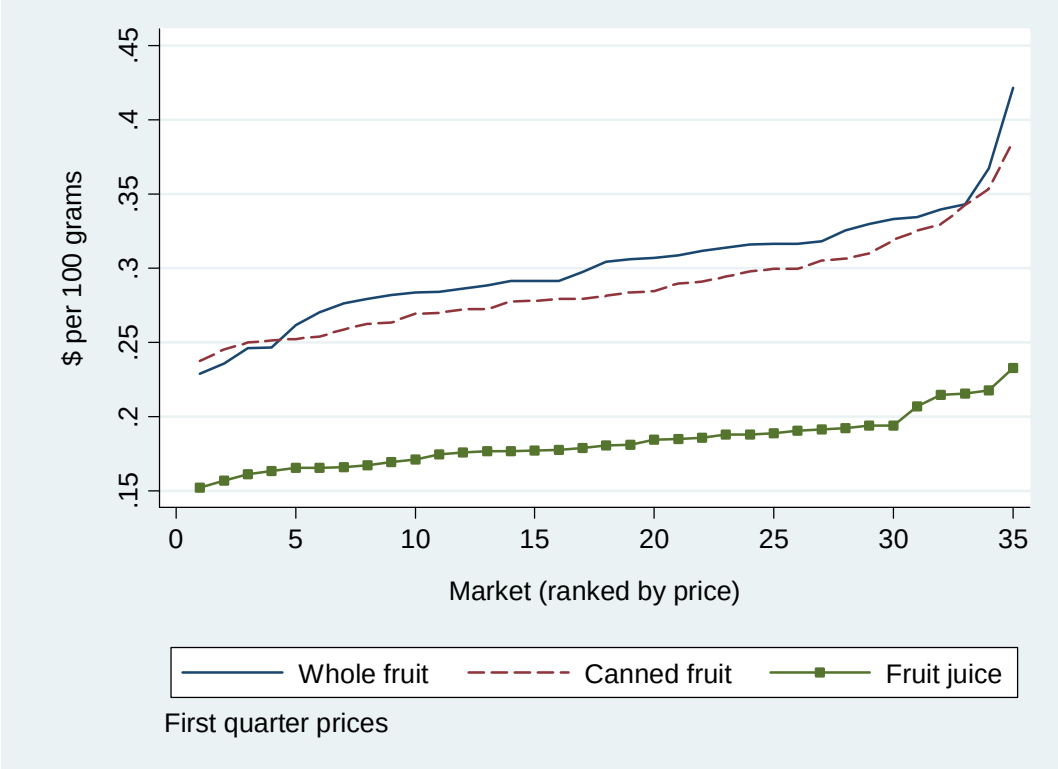
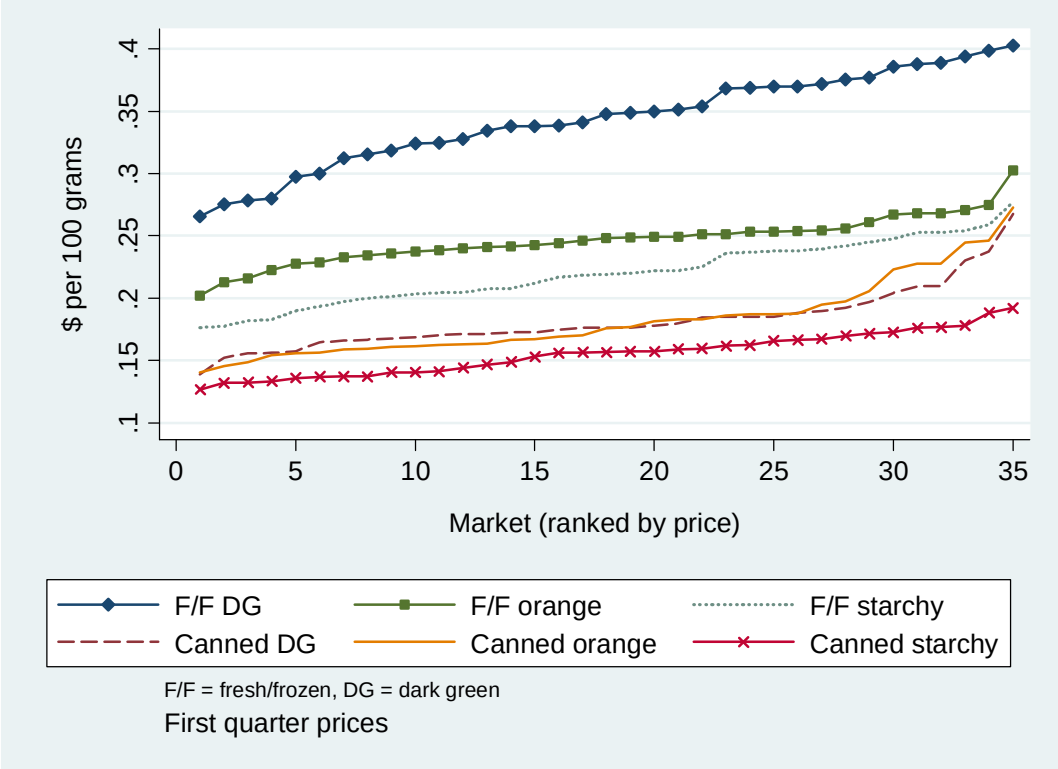
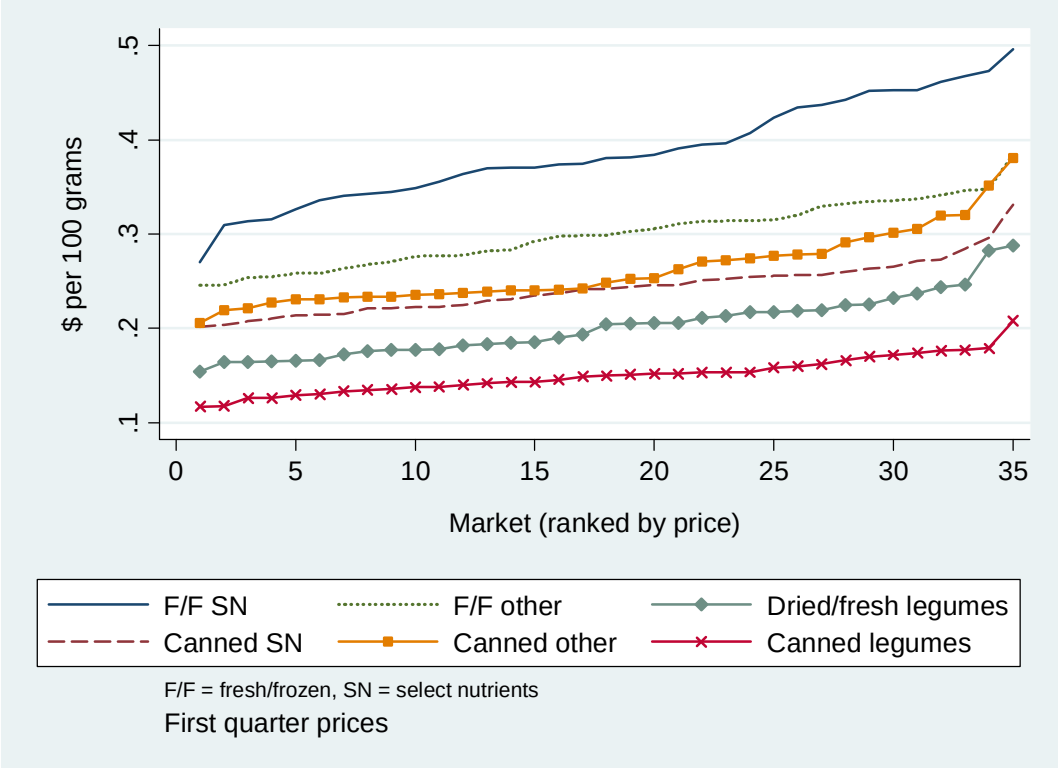


Figure 2. Price of Vegetable groups by market.



(a)



(b)

Figure 3. Price of Packaged grain products by market.

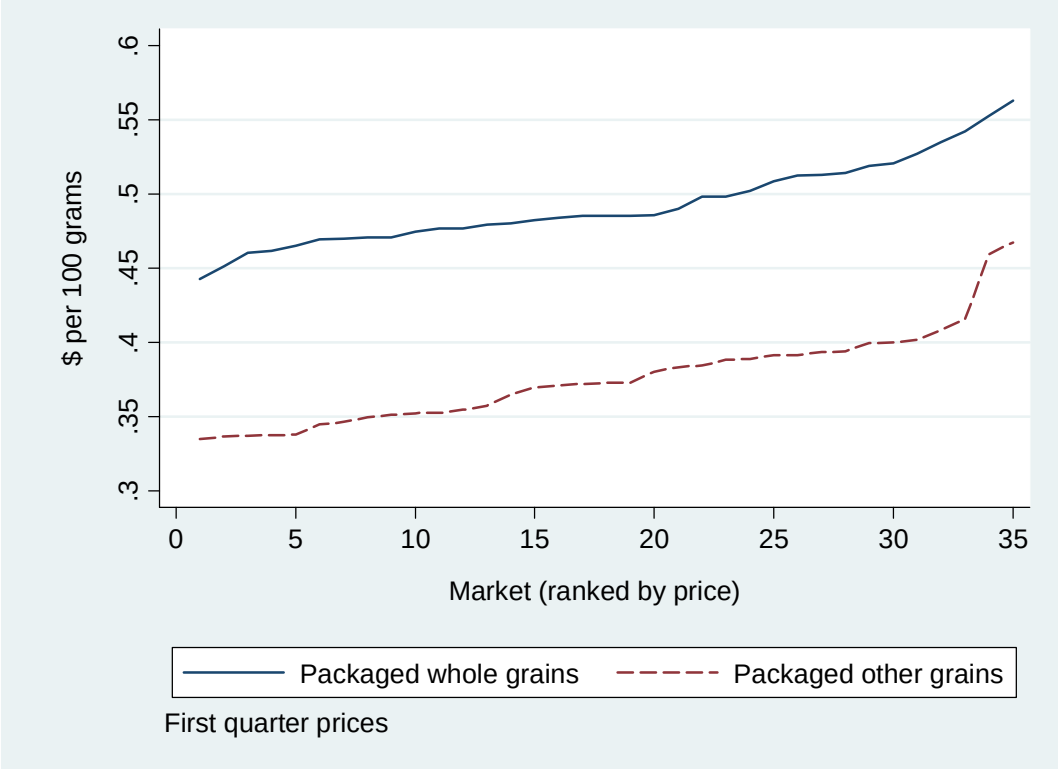


Figure 4. Price of Dairy groups by market.

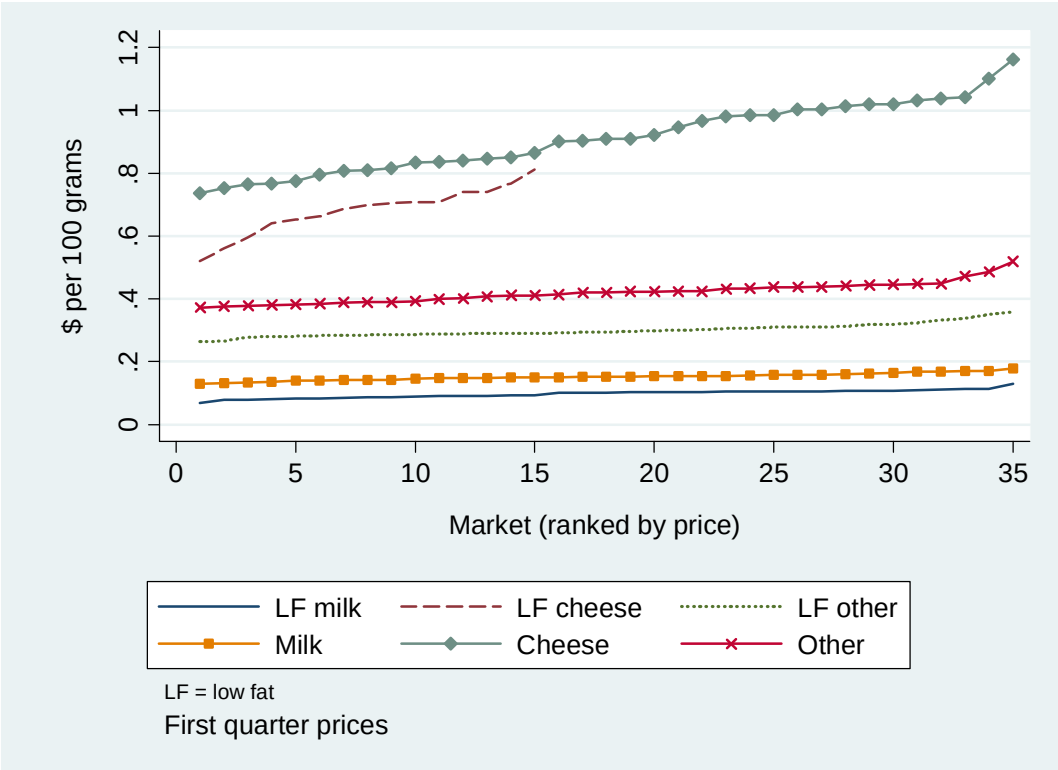
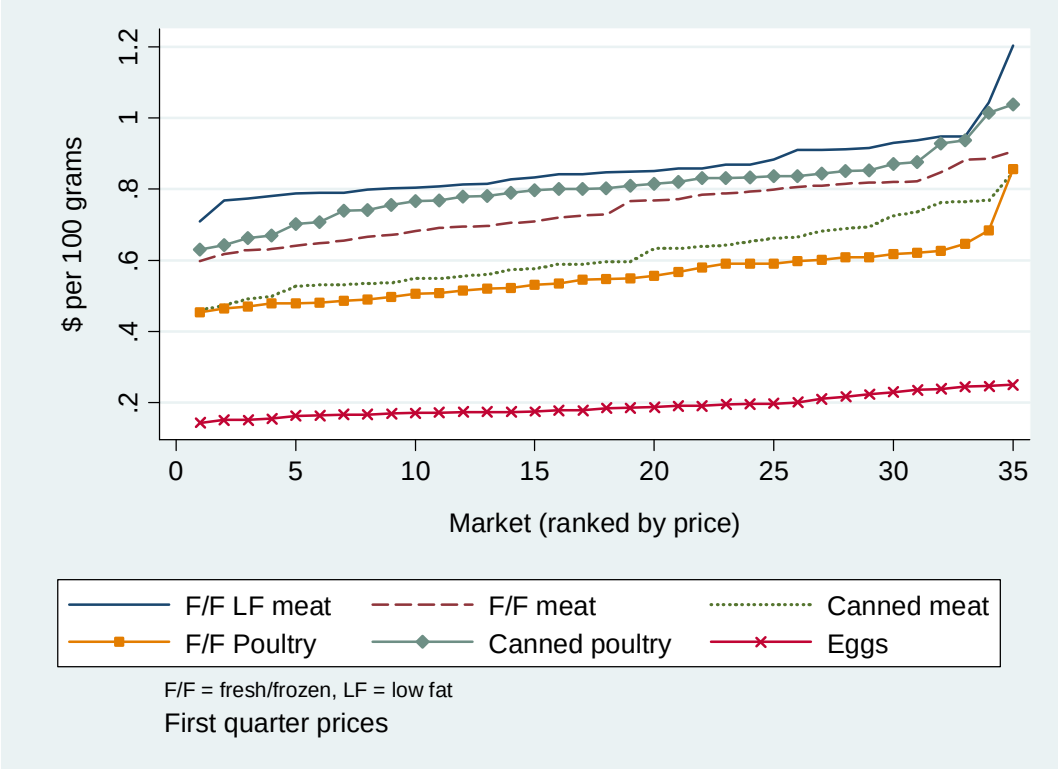


Figure 5. Price of Meat and Protein groups by market.



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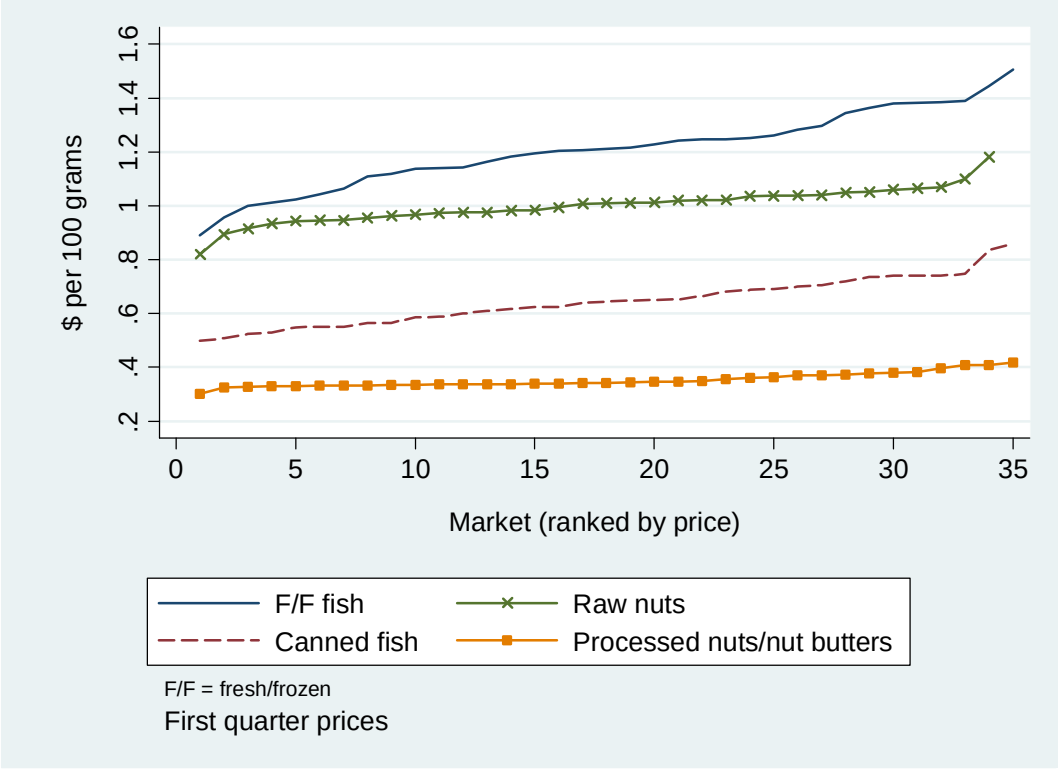


(b)

Figure 6. Price of selected Commercially Prepared groups by market.

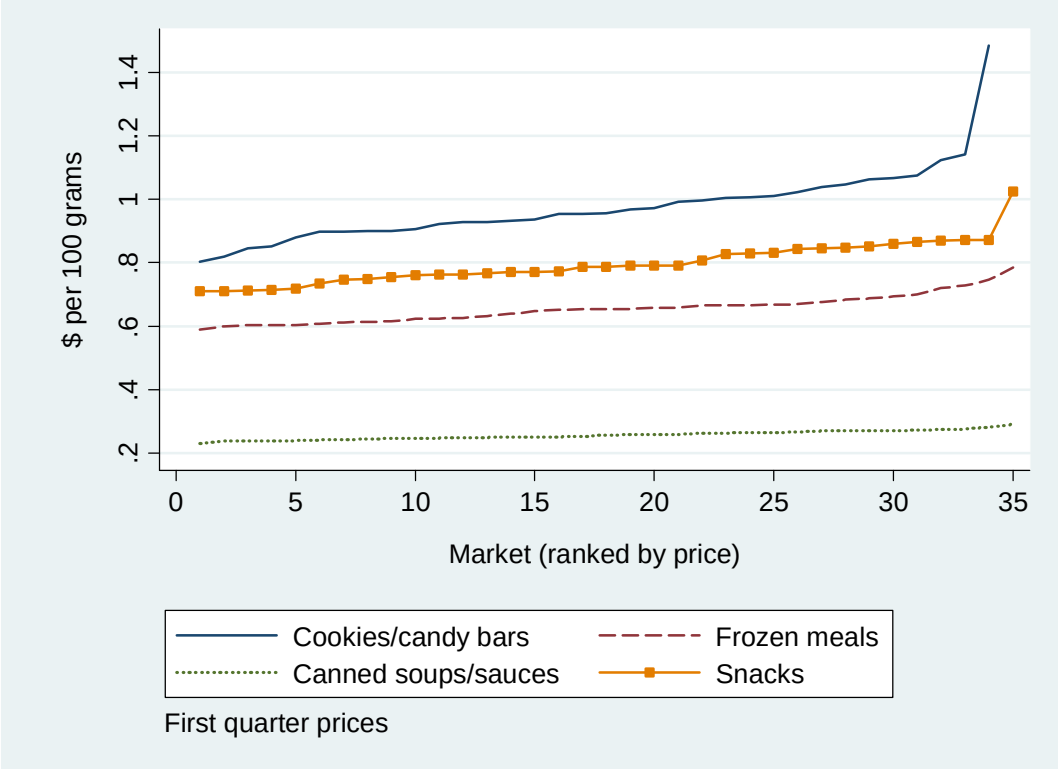


Figure 7. Price premium fresh/frozen dark green vegetables vs starchy vegetables by market.

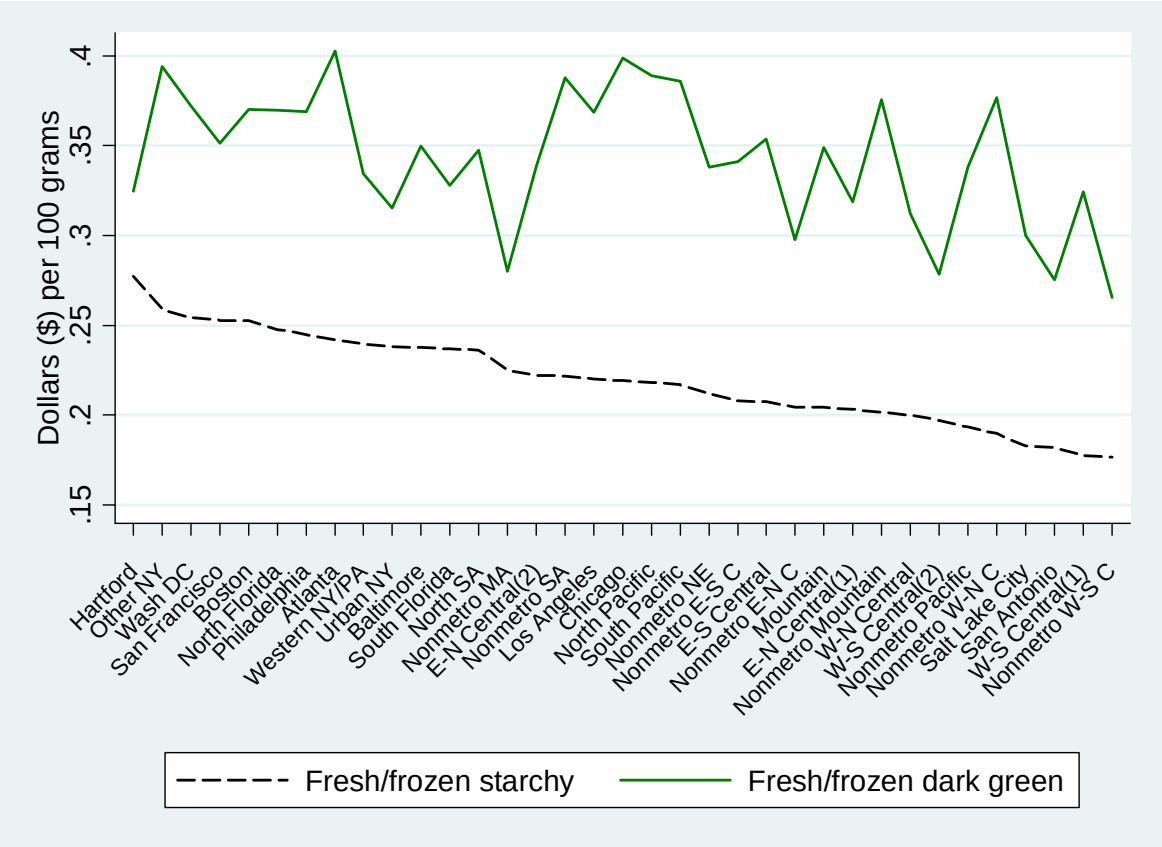


Figure 8. Price premium whole? milk vs low fat milk by market.

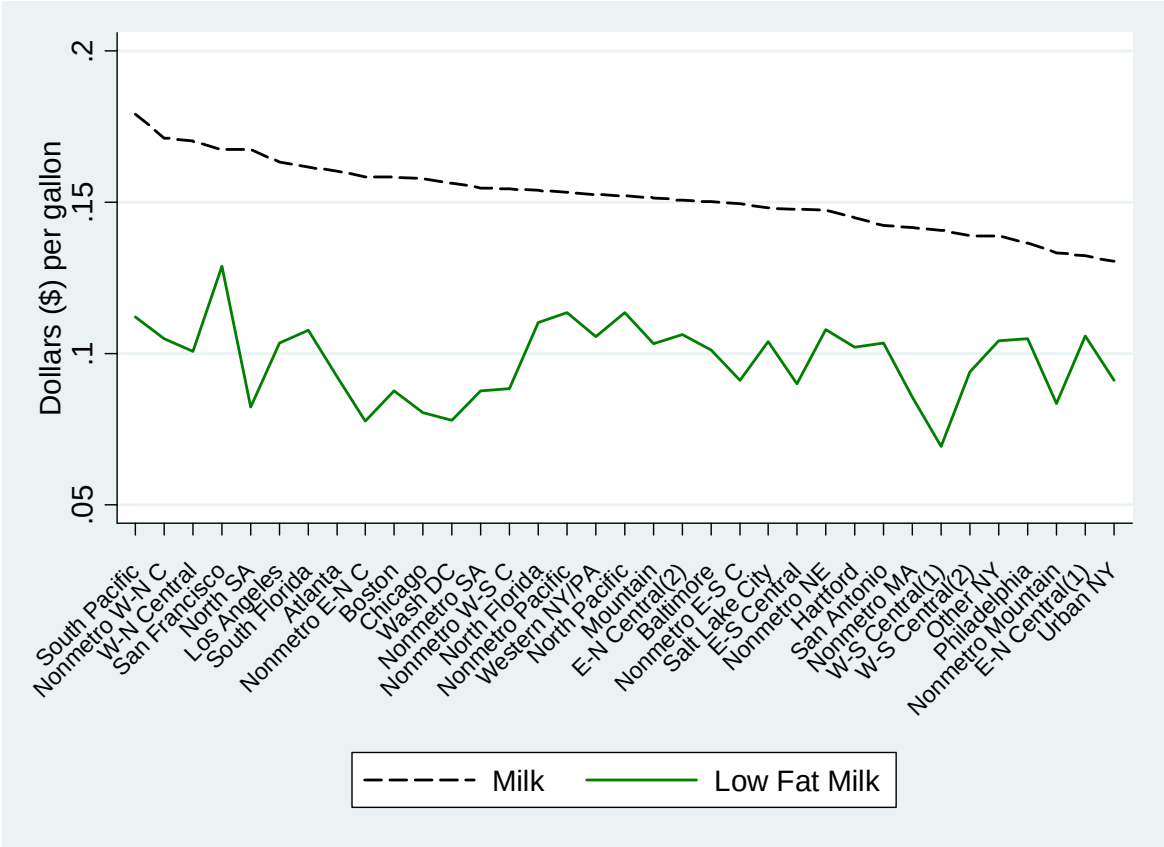


Figure 9. Price premium for packaged whole grain items by market.

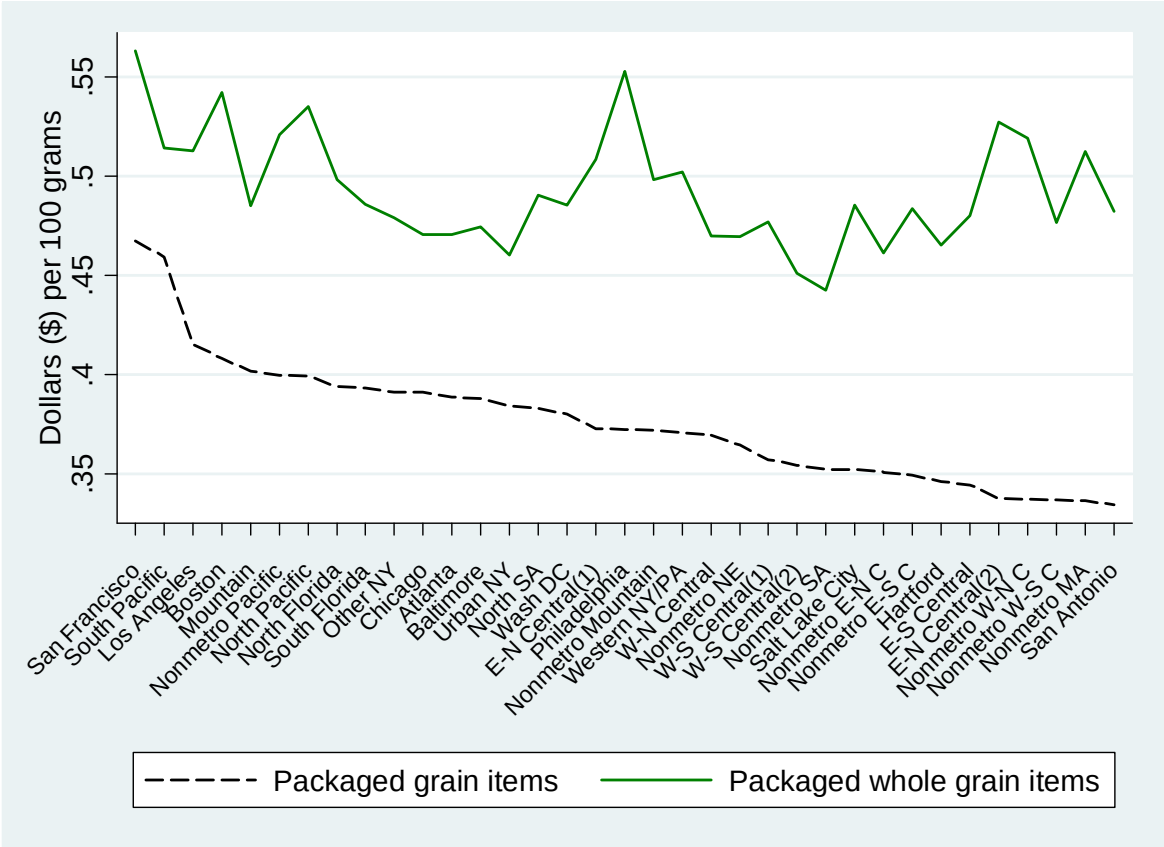
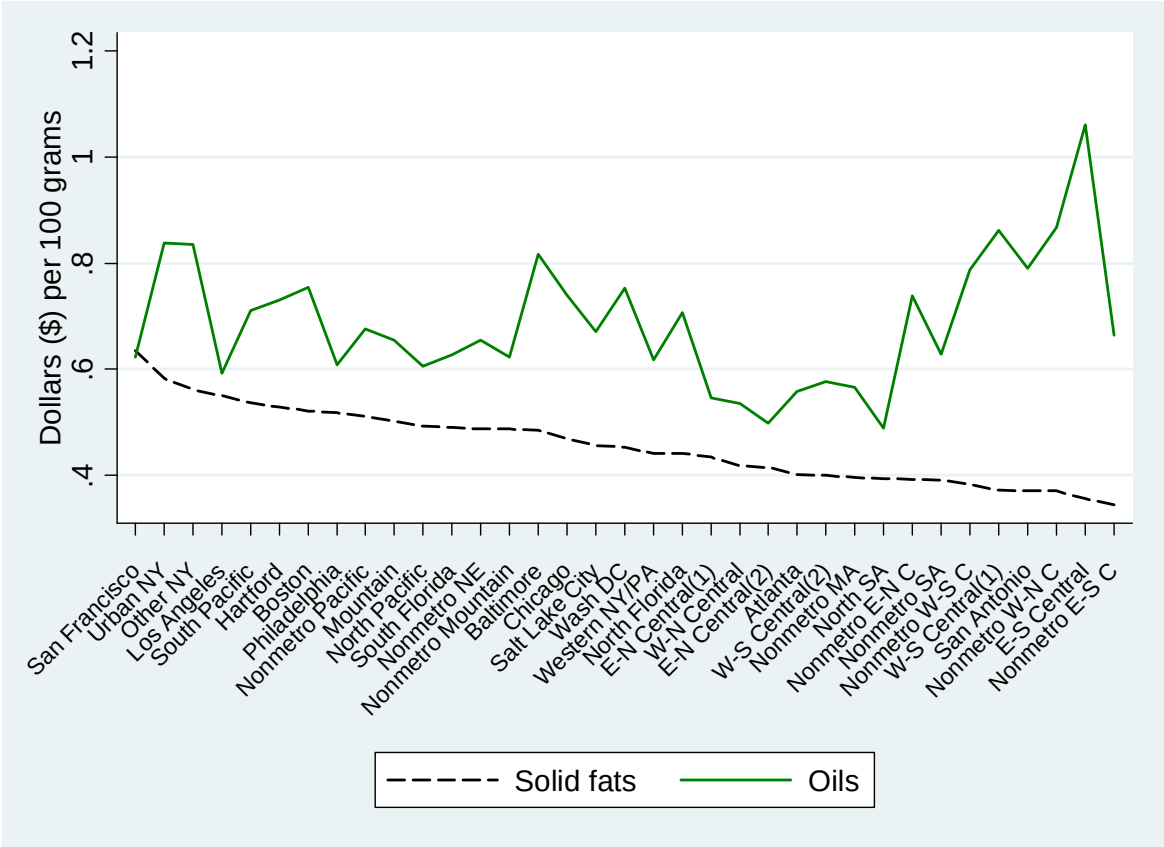


Figure 10. Price premium for oils (vs solid fats) by market.



Appendices

Appendix A

Details on purchases reported as counts that were not converted to gram weight.

This Appendix provides details on the major categories and specific foods where a large amount of purchases were not converted to gram weight. There are additional observations in other categories that were also not converted, but because they appeared more as individual occurrences rather than for entire food types, we do not detail those changes here.

Dark Green Vegetables
There are 2,018 with no gram weight – not able to get a typical weight for collard or mustards greens, swiss chard, broccoli rabe or brocollini

Normal Grains - Packaged
There are 87,554 observations where gram weight could not be defined; 82,792 of those observations are from the Mexican tortillas category. Gram weight could not be defined for this category because there is no information on package sizes aside from the number of tortillas in each package; to define gram weight it would be necessary to determine how many grams per package for each size package per producer.

Whole Grains - Packaged
There are 8,779 where gram weight could not be defined, again due to the Mexican tortillas category.

Frozen Not Sweet
There are 4,812 uncorrected for weight observations due to unknown package sizes.

Frozen Sweets
There are 214,240 uncorrected observations (about 28% of all frozen sweet observations) due to the Ice Pops categories.

Not Sweet Ready to Eat
There are 1,364 observations (.40% of all observations) where gram weight is missing. Due to control brand observations where it is impossible to discern the package weight.

Packaged Sweets

There are 18,943 observations where gram weight is missing. Mostly control brand products and no way to know package weight.

Ready to Eat Sweets

There are 3,598 observations that are uncorrected for weight.

Appendix B

Table B1. Annual mean prices per 100 grams ($) and coefficients of variation, Vegetable groups, by Census Division, 2006.

	Division								
Food Group	**New England**	**Middle Atlantic**	**East North Central**	**West North Central**	**South Atlantic**	**East South Central**	**West South Central**	**Mountain**	**Pacific**
Fresh/Frozen dark green vegetables	0.377	0.370	0.331	0.324	0.377	0.341	0.337	0.306	0.300
	(0.079)	(0.041)	(0.040)	(0.113)	(0.065)	(0.041)	(0.053)	(0.033)	(0.081)
Canned dark green vegetables	0.184	0.203	0.179	0.170	0.186	0.164	0.166	0.187	0.221
	(0.149)	(0.178)	(0.047)	(0.014)	(0.053)	(0.059)	(0.054)	(0.113)	(0.129)
Fresh/Frozen orange vegetables	0.262	0.244	0.247	0.242	0.261	0.263	0.243	0.246	0.234
	(0.071)	(0.068)	(0.044)	(0.027)	(0.086)	(0.050)	(0.064)	(0.035)	(0.047)
Canned orange vegetables	0.189	0.186	0.175	0.165	0.182	0.157	0.166	0.190	0.237
	(0.022)	(0.088)	(0.061)	(0.049)	(0.074)	(0.005)	(0.019)	(0.069)	(0.086)
Fresh/Frozen starchy vegetables	0.250	0.242	0.214	0.200	0.244	0.207	0.187	0.204	0.225
	(0.100)	(0.054)	(0.046)	(0.048)	(0.052)	(0.013)	(0.054)	(0.053)	(0.095)
Canned starchy vegetables	0.170	0.164	0.151	0.133	0.168	0.141	0.138	0.156	0.172
	(0.063)	(0.131)	(0.053)	(0.034)	(0.041)	(0.017)	(0.033)	(0.045)	(0.077)
Fresh/Frozen select nutrient vegetables	0.457	0.413	0.369	0.336	0.411	0.333	0.341	0.334	0.384
	(0.059)	(0.047)	(0.027)	(0.086)	(0.073)	(0.075)	(0.046)	(0.132)	(0.098)
Canned select nutrients	0.276	0.267	0.248	0.241	0.255	0.232	0.250	0.275	0.319
	(0.039)	(0.083)	(0.081)	(0.074)	(0.080)	(0.011)	(0.031)	(0.059)	(0.106)
Fresh/Frozen other vegetables	0.332	0.318	0.284	0.258	0.317	0.271	0.264	0.298	0.316
	(0.042)	(0.043)	(0.048)	(0.009)	(0.069)	(0.033)	(0.063)	(0.047)	(0.096)
Canned other vegetables	0.291	0.270	0.264	0.234	0.263	0.228	0.233	0.263	0.280
	(0.131)	(0.158)	(0.078)	(0.049)	(0.094)	(0.017)	(0.068)	(0.014)	(0.137)
Frozen/Dried Legumes	0.212	0.219	0.189	0.181	0.205	0.173	0.170	0.211	0.273
	(0.165)	(0.129)	(0.032)	(0.056)	(0.068)	(0.026)	(0.041)	(0.038)	(0.184)

Canned Legumes	0.157 (0.050)	0.152 (0.085)	0.154 (0.058)	0.139 (0.054)	0.155 (0.049)	0.140 (0.003)	0.132 (0.049)	0.151 (0.053)	0.186 (0.096)

Note: Division annual mean price is calculated as the mean of annual market group mean prices in each Division. Annual market mean prices are the simple mean of the mean price in each of the four quarters in each market group. Coefficient of variation in parentheses.

Table B2. Annual mean prices per 100 grams ($) and coefficients of variation, Grain groups, by Census Division, 2006.

Food Group	Division								
	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
Whole grain bread, rolls, rice, pasta, cereal	0.533 (0.051)	0.522 (0.048)	0.484 (0.026)	0.474 (0.034)	0.509 (0.061)	0.477 (0.012)	0.461 (0.030)	0.472 (0.033)	0.510 (0.045)
Whole grain flour and mixes	0.359 (0.044)	0.196 (0.264)	0.220 (0.248)	0.225 (0.258)	0.241 (0.301)	0.172 (0.027)	0.179 (0.170)	0.158 (0.344)	0.270 (0.134)
Whole grain frozen/ready to cook	0.763 (0.080)	0.895 (0.173)	0.782 (0.288)	0.798 (0.120)	0.935 (0.152)	0.793 (0.076)	0.894 (0.263)	0.589 (0.688)	1.185 (0.203)
other bread, rolls, rice, pasta, cereal	0.399 (0.044)	0.383 (0.071)	0.367 (0.048)	0.359 (0.063)	0.386 (0.036)	0.354 (0.018)	0.345 (0.036)	0.379 (0.060)	0.428 (0.070)
other flour and mixes	0.186 (0.105)	0.184 (0.170)	0.154 (0.097)	0.142 (0.085)	0.183 (0.185)	0.135 (0.018)	0.150 (0.087)	0.180 (0.099)	0.211 (0.017)
other frozen/ready to cook grains	0.557 (0.012)	0.522 (0.071)	0.511 (0.067)	0.482 (0.041)	0.497 (0.074)	0.444 (0.038)	0.438 (0.052)	0.544 (0.033)	0.608 (0.095)

Note: Division annual mean price is calculated as the mean of annual market group mean prices in each Division. Annual market mean prices are the simple mean of the mean price in each of the four quarters in each market group. Coefficient of variation in parentheses.

Table B3. Annual mean prices per 100 grams ($) and coefficients of variation, Dairy groups, by Census Division, 2006.

	Division								
Food Group	**New England**	**Middle Atlantic**	**East North Central**	**West North Central**	**South Atlantic**	**East South Central**	**West South Central**	**Mountain**	**Pacific**
Low fat cheese	0.776 (0.169)	0.763 (0.039)	0.583 (0.092)	0.533 (0.059)	0.718 (0.084)	0.000 0.000	0.664 (0.075)	0.534 (0.192)	0.677 (0.116)
Low fat yogurt & other dairy	0.319 (0.075)	0.316 (0.096)	0.305 (0.047)	0.307 (0.007)	0.305 (0.041)	0.290 (0.001)	0.291 (0.035)	0.297 (0.019)	0.320 (0.070)
Regular fat milk	0.161 (0.015)	0.145 (0.056)	0.157 (0.040)	0.177 (0.015)	0.162 (0.032)	0.162 (0.045)	0.149 (0.020)	0.152 (0.046)	0.169 (0.026)
Regular fat cheese	0.996 (0.025)	0.982 (0.080)	0.825 (0.065)	0.768 (0.074)	0.929 (0.099)	0.751 (0.020)	0.802 (0.055)	0.886 (0.075)	1.000 (0.103)
Regular fat yogurt & other dairy	0.457 (0.100)	0.433 (0.105)	0.412 (0.050)	0.390 (0.043)	0.410 (0.053)	0.410 (0.034)	0.405 (0.027)	0.407 (0.055)	0.437 (0.041)

Note: Division annual mean price is calculated as the mean of annual market group mean prices in each Division. Annual market mean prices are the simple mean of the mean price in each of the four quarters in each market group. Coefficient of variation in parentheses.

Table B4. Annual mean prices per 100 grams ($) and coefficients of variation, Protein groups, by Census Division, 2006.

	Division								
	New England	**Middle Atlantic**	**East North Central**	**West North Central**	**South Atlantic**	**East South Central**	**West South Central**	**Mountain**	**Pacific**
Fresh/frozen low fat meat	0.930	0.904	0.853	0.769	0.923	0.792	0.802	0.850	0.884
	(0.133)	(0.038)	(0.042)	(0.014)	(0.071)	(0.008)	(0.035)	(0.062)	(0.080)
Fresh/frozen regular fat meat	0.893	0.806	0.718	0.667	0.776	0.649	0.659	0.723	0.799
	(0.026)	(0.075)	(0.069)	(0.043)	(0.087)	(0.019)	(0.058)	(0.102)	(0.078)
Canned meat	0.825	0.657	0.645	0.649	0.607	0.499	0.541	0.626	0.688
	(0.146)	(0.092)	(0.058)	(0.058)	(0.077)	(0.029)	(0.057)	(0.079)	(0.043)
Fresh/frozen poultry	0.689	0.583	0.546	0.486	0.562	0.502	0.511	0.568	0.554
	(0.121)	(0.115)	(0.072)	(0.011)	(0.090)	(0.132)	(0.085)	(0.075)	(0.092)
Canned poultry	0.850	0.831	0.794	0.793	0.792	0.796	0.788	0.786	0.702
	(0.120)	(0.062)	(0.015)	(0.007)	(0.044)	(0.025)	(0.027)	(0.104)	(0.061)
Fresh/frozen fish	1.448	1.317	1.173	1.091	1.318	1.069	1.167	1.291	1.343
	(0.070)	(0.054)	(0.062)	(0.031)	(0.074)	(0.010)	(0.071)	(0.091)	(0.062)
Canned fish	0.743	0.720	0.654	0.568	0.702	0.531	0.590	0.704	0.771
	(0.033)	(0.085)	(0.055)	(0.072)	(0.103)	(0.024)	(0.043)	(0.075)	(0.063)
Raw nuts and seeds	1.041	1.028	0.987	0.941	1.050	0.980	1.018	1.001	1.048
	(0.069)	(0.038)	(0.017)	(0.050)	(0.087)	(0.003)	(0.022)	(0.021)	(0.046)
Processed nuts, seeds and nut butters	0.351	0.352	0.347	0.337	0.351	0.334	0.338	0.362	0.408
	(0.052)	(0.105)	(0.025)	(0.029)	(0.034)	(0.003)	(0.006)	(0.058)	(0.042)
Eggs	0.232	0.201	0.163	0.148	0.183	0.163	0.167	0.174	0.234
	(0.066)	(0.136)	(0.076)	(0.040)	(0.061)	(0.014)	(0.034)	(0.119)	(0.088)

Note: Division annual mean price is calculated as the mean of annual market group mean prices in each Division. Annual market mean prices are the simple mean of the mean price in each of the four quarters in each market group. Coefficient of variation in parentheses.

Table B5. Annual mean prices per 100 grams ($) and coefficients of variation, Fats, Sugars and Beverages, by Census Division, 2006.

	Division								
	New England	**Middle Atlantic**	**East North Central**	**West North Central**	**South Atlantic**	**East South Central**	**West South Central**	**Mountain**	**Pacific**
Oils	0.788 (0.044)	0.679 (0.094)	0.639 (0.034)	0.616 (0.049)	0.649 (0.125)	0.512 (0.044)	0.541 (0.059)	0.728 (0.084)	0.818 (0.121)
Solid fats	0.499 (0.069)	0.500 (0.153)	0.428 (0.085)	0.396 (0.094)	0.438 (0.100)	0.353 (0.005)	0.381 (0.033)	0.484 (0.047)	0.562 (0.091)
Raw sugars	0.230 (0.032)	0.220 (0.211)	0.202 (0.055)	0.176 (0.083)	0.213 (0.174)	0.161 (0.002)	0.188 (0.071)	0.241 (0.027)	0.243 (0.092)
Non-alcoholic carbonated beverages	0.088 (0.072)	0.086 (0.067)	0.086 (0.022)	0.089 (0.006)	0.091 (0.044)	0.090 (0.015)	0.091 (0.012)	0.097 (0.063)	0.104 (0.071)
Non-carbonated caloric beverages	0.127 (0.087)	0.121 (0.070)	0.118 (0.039)	0.123 (0.001)	0.129 (0.136)	0.102 (0.016)	0.108 (0.053)	0.124 (0.075)	0.137 (0.118)
Water	0.074 (0.143)	0.077 (0.167)	0.070 (0.056)	0.070 (0.004)	0.070 (0.100)	0.067 (0.084)	0.068 (0.045)	0.069 (0.062)	0.073 (0.112)

Note: Division annual mean price is calculated as the mean of annual market group mean prices in each Division. Annual market mean prices are the simple mean of the mean price in each of the four quarters in each market group. Coefficient of variation in parentheses.

Table B6. Annual mean prices per 100 grams ($) and coefficients of variation, Prepared and ready to eat foods, by Census Division, 2006.

	Division								
	New England	**Middle Atlantic**	**East North Central**	**West North Central**	**South Atlantic**	**East South Central**	**West South Central**	**Mountain**	**Pacific**
Ice cream and frozen desserts	0.355 (0.073)	0.331 (0.140)	0.322 (0.062)	0.303 (0.089)	0.351 (0.054)	0.328 (0.005)	0.337 (0.036)	0.332 (0.079)	0.373 (0.096)
Baked good mixes	0.786 (0.071)	0.731 (0.092)	0.712 (0.029)	0.712 (0.010)	0.708 (0.083)	0.671 (0.074)	0.619 (0.005)	0.797 (0.029)	0.816 (0.101)
Packaged sweets/baked goods	0.982 (0.018)	0.943 (0.061)	0.879 (0.056)	0.821 (0.045)	0.928 (0.077)	0.830 (0.032)	0.885 (0.033)	0.891 (0.050)	1.073 (0.140)
Bakery items, ready to eat	0.570 (0.064)	0.572 (0.100)	0.528 (0.114)	0.464 (0.121)	0.554 (0.051)	0.521 (0.011)	0.525 (0.075)	0.510 (0.015)	0.593 (0.120)
Frozen entrees and sides	0.711 (0.023)	0.689 (0.077)	0.654 (0.099)	0.613 (0.033)	0.665 (0.045)	0.601 (0.021)	0.621 (0.024)	0.630 (0.058)	0.688 (0.042)
Canned soups, sauces, prepared foods	0.267 (0.053)	0.255 (0.075)	0.255 (0.047)	0.249 (0.015)	0.258 (0.046)	0.237 (0.006)	0.239 (0.030)	0.256 (0.048)	0.280 (0.044)
Packaged snacks	0.838 (0.020)	0.799 (0.082)	0.772 (0.063)	0.735 (0.035)	0.817 (0.053)	0.743 (0.002)	0.773 (0.033)	0.784 (0.034)	0.883 (0.049)
Ready to cook meals and sides	0.789 (0.050)	0.787 (0.110)	0.724 (0.075)	0.681 (0.025)	0.710 (0.094)	0.624 (0.009)	0.635 (0.017)	0.751 (0.054)	0.847 (0.110)
Ready to eat deli items (hot and cold)	1.010 (0.031)	0.911 (0.058)	0.815 (0.038)	0.890 (0.010)	0.880 (0.069)	0.803 (0.009)	0.811 (0.108)	0.857 (0.033)	0.895 (0.092)

Note: Division annual mean price is calculated as the mean of annual market group mean prices in each Division. Annual market mean prices are the simple mean of the mean price in each of the four quarters in each market group. Coefficient of variation in parentheses.

Table B7. Annual mean prices per 100 grams ($) and coefficients of variation, Fruit and Vegetable groups, by Census Region, 2006.

	Region			
	East	**Central**	**South**	**West**
Fresh/Frozen fruit	0.329 (0.105)	0.273 (0.088)	0.296 (0.092)	0.296 (0.081)
Canned Fruit	0.296 (0.112)	0.267 (0.048)	0.276 (0.053)	0.303 (0.096)
Fruit Juice	0.177 (0.061)	0.187 (0.040)	0.183 (0.061)	0.216 (0.082)
Fresh/Frozen dark green vegetables	0.373 (0.054)	0.329 (0.060)	0.359 (0.079)	0.302 (0.065)
Canned dark green vegetables	0.196 (0.167)	0.176 (0.046)	0.176 (0.078)	0.208 (0.145)
Fresh/Frozen orange vegetables	0.250 (0.074)	0.245 (0.038)	0.256 (0.079)	0.239 (0.047)
Canned orange vegetables	0.187 (0.068)	0.172 (0.061)	0.173 (0.081)	0.219 (0.135)
Fresh/Frozen starchy vegetables	0.245 (0.070)	0.209 (0.053)	0.220 (0.131)	0.217 (0.093)
Canned starchy vegetables	0.167 (0.105)	0.145 (0.076)	0.155 (0.103)	0.166 (0.083)
Fresh/Frozen select nutrient vegetables	0.430 (0.071)	0.358 (0.063)	0.377 (0.118)	0.365 (0.123)
Canned select nutrients	0.270 (0.068)	0.246 (0.073)	0.250 (0.068)	0.303 (0.116)
Fresh/Frozen other vegetables	0.323 (0.046)	0.275 (0.063)	0.294 (0.109)	0.309 (0.084)
Canned other vegetables	0.278 (0.142)	0.254 (0.090)	0.249 (0.102)	0.274 (0.112)
Frozen/Dried Legumes	0.216 (0.132)	0.187 (0.041)	0.189 (0.109)	0.250 (0.200)
Canned Legumes	0.154 (0.071)	0.149 (0.073)	0.146 (0.085)	0.173 (0.132)

Note: Regional annual mean price is calculated as the mean of annual market group mean prices in each Region. Annual market mean prices are the simple mean of the mean price in each of the four quarters in each market group. Coefficient of variation in parentheses.

Table B8. Annual mean prices per 100 grams ($) and coefficients of variation, Grain and Dairy groups, by Census Region, 2006.

	Region			
	East	**Central**	**South**	**West**
Whole grain bread, rolls, rice, pasta, cereal	0.526	0.481	0.490	0.496
	(0.046)	(0.028)	(0.066)	(0.056)
Whole grain flour and mixes	0.329	0.222	0.211	0.228
	(0.228)	(0.224)	(0.299)	(0.308)
Whole grain frozen/ready to cook	0.838	0.788	0.898	0.946
	(0.161)	(0.229)	(0.184)	(0.444)
other bread, rolls, rice, pasta, cereal	0.389	0.364	0.369	0.409
	(0.062)	(0.048)	(0.064)	(0.088)
other flour and mixes	0.184	0.150	0.165	0.199
	(0.140)	(0.094)	(0.193)	(0.094)
other frozen/ready to cook grains	0.535	0.501	0.471	0.584
	(0.062)	(0.063)	(0.088)	(0.095)
Low fat milk	0.103	0.082	0.104	0.092
	(0.123)	(0.048)	(0.067)	(0.151)
Low fat cheese	0.769	0.563	0.698	0.630
	(0.111)	(0.088)	(0.086)	(0.169)
Low fat yogurt & other dairy	0.317	0.306	0.298	0.311
	(0.083)	(0.037)	(0.043)	(0.068)
Regular fat milk	0.151	0.163	0.158	0.162
	(0.069)	(0.071)	(0.049)	(0.063)
Regular fat cheese	0.987	0.806	0.863	0.958
	(0.062)	(0.071)	(0.119)	(0.109)
Regular fat yogurt & other dairy	0.442	0.405	0.408	0.426
	(0.099)	(0.052)	(0.042)	(0.056)

Note: Regional annual mean price is calculated as the mean of annual market group mean prices in each Region. Annual market mean prices are the simple mean of the mean price in each of the four quarters in each market group. Coefficient of variation in parentheses.

Table B9. Annual mean prices per 100 grams ($) and coefficients of variation, Protein groups, by Census Region, 2006.

	Region			
	East	**Central**	**South**	**West**
Fresh/frozen low fat meat	0.914	0.825	0.866	0.871
	(0.079)	(0.063)	(0.093)	(0.072)
Fresh/frozen regular fat meat	0.839	0.701	0.720	0.771
	(0.078)	(0.069)	(0.113)	(0.095)
Canned meat	0.720	0.646	0.570	0.665
	(0.163)	(0.052)	(0.101)	(0.071)
Fresh/frozen poultry	0.623	0.526	0.537	0.559
	(0.140)	(0.082)	(0.101)	(0.081)
Canned poultry	0.838	0.794	0.792	0.734
	(0.081)	(0.012)	(0.035)	(0.095)
Fresh/frozen fish	1.366	1.146	1.233	1.324
	(0.075)	(0.063)	(0.105)	(0.070)
Canned fish	0.729	0.626	0.641	0.746
	(0.068)	(0.089)	(0.138)	(0.078)
Raw nuts and seeds	1.032	0.972	1.029	1.031
	(0.047)	(0.035)	(0.069)	(0.044)
Processed nuts, seeds and nut butters	0.352	0.343	0.345	0.390
	(0.084)	(0.028)	(0.033)	(0.075)
Eggs	0.213	0.158	0.175	0.211
	(0.128)	(0.080)	(0.071)	(0.172)

Note: Regional annual mean price is calculated as the mean of annual market group mean prices in each Region. Annual market mean prices are the simple mean of the mean price in each of the four quarters in each market group. Coefficient of variation in parentheses.

Table B10. Annual mean prices per 100 grams ($) and coefficients of variation, Fat, sugar, beverage and prepared food groups, by Census Region, 2006.

	Region			
	East	**Central**	**South**	**West**
Oils	0.720	0.631	0.595	0.785
	(0.106)	(0.039)	(0.145)	(0.120)
Solid fats	0.500	0.417	0.407	0.533
	(0.122)	(0.088)	(0.118)	(0.107)
Raw sugars	0.223	0.193	0.197	0.242
	(0.160)	(0.089)	(0.169)	(0.072)
Non-alcoholic carbonated beverages	0.087	0.087	0.091	0.101
	(0.065)	(0.024)	(0.033)	(0.074)
Non-carbonated caloric beverages	0.123	0.119	0.118	0.132
	(0.074)	(0.037)	(0.147)	(0.112)
Water	0.076	0.070	0.069	0.072
	(0.150)	(0.043)	(0.083)	(0.095)
Ice cream and frozen desserts	0.340	0.315	0.343	0.358
	(0.117)	(0.069)	(0.051)	(0.104)
Baked good mixes	0.751	0.712	0.675	0.809
	(0.087)	(0.023)	(0.089)	(0.080)
Packaged sweets/baked goods	0.957	0.860	0.900	1.005
	(0.051)	(0.060)	(0.072)	(0.149)
Bakery items, ready to eat	0.571	0.507	0.540	0.562
	(0.083)	(0.123)	(0.060)	(0.123)
Frozen entrees and sides	0.698	0.640	0.642	0.667
	(0.061)	(0.086)	(0.055)	(0.063)
Canned soups, sauces, prepared foods	0.259	0.253	0.249	0.271
	(0.067)	(0.039)	(0.055)	(0.062)
Packaged snacks	0.814	0.759	0.792	0.846
	(0.066)	(0.057)	(0.056)	(0.074)
Ready to cook meals and sides	0.788	0.710	0.674	0.811
	(0.088)	(0.067)	(0.093)	(0.110)
Ready to eat deli items (hot and cold)	0.948	0.840	0.847	0.881
	(0.071)	(0.055)	(0.085)	(0.076)

Note: Regional annual mean price is calculated as the mean of annual market group mean prices in each Region. Annual market mean prices are the simple mean of the mean price in each of the four quarters in each market group. Coefficient of variation in parentheses.