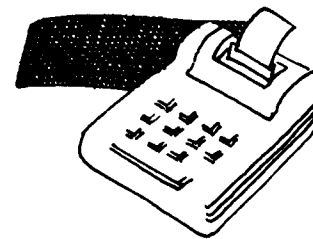# Technical Note

Average retail food prices: a brief history of methods

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The Bureau of Labor Statistics publishes average retail food prices on a monthly basis in a news release, *Consumer Prices: Energy and Food*. Data are published for the United States and for four major geographic regions—Northeast, North Central, South, and West.[1] The report presents average prices for 94 food items that are calculated from data used in compiling the Consumer Price Index (CPI). All of the major CPI "food at home" categories—cereals and bakery products; meats, poultry, fish, and eggs; dairy products; fruits and vegetables; and other foods at home—are represented in the list of average food prices. Each report also contains data for the two preceding months.

Average retail food prices are among the oldest data series published by BLS. The first report, issued in 1904, contained average monthly retail prices for about 30 foods for the years 1890–1903.[2] Input data for the report were obtained retroactively from account books and records of about 800 firms in 171 cities.

Prior to 1964, retail food prices were weighted averages of prices collected for use in compiling the CPI. From December 1963 through June 1978, average food prices were estimated from the movement of the CPI.[3] Each year, usually in January, special benchmark prices were calculated for narrowly defined classes of food products. These benchmark prices were adjusted in succeeding months by price changes reflected in the appropriate CPI series. Because the CPI series pertained to more broadly defined product categories than did the benchmark average food prices, a new set of benchmark prices was computed annually to prevent estimated prices from deviating widely from a true average of collected prices.

The Bureau adopted this estimation technique for average prices as a result of changes made in the specification pricing procedures during a revision of the CPI, completed in December 1963. As a part of that revision, the specifications used in collecting CPI prices were broadened to encompass

a wider sample of goods and services. While this procedure improved the item sample for the CPI, it made calculation of the average food prices difficult because of the greater heterogeneity of foods being priced within a specification. The "benchmark and estimation" technique for calculating average food prices was then developed to meet the continuing needs of users of such information.

Because of the major methodological changes introduced in the 1978 revision of the CPI, a completely different approach had to be developed for calculating average food prices. The demanding schedule for the completion of the 1978 CPI revision made it impossible to revise the average food price program in time to coincide with the release of the revised CPI. Therefore, average retail food prices are not available from July 1978 through December 1979. Data based on the revised CPI sample are available beginning in January 1980, but average prices in the current series are not comparable to estimates published through June 1978.

Development of the new average food price program for 1980 presented the BLS staff with a number of difficulties. Because of the substantial change in price collection methodology employed in the revised CPI, a greater variety of food items (as well as nonfood goods and services) have been selected for pricing. For the pre-1978 CPI, BLS field representatives had priced items that conformed to detailed specifications which were basically the same for every store across the country. Thus, a large number of prices were obtained for each of the almost 100 food items. For an item such as cookies, for example, about 1,100 prices were collected nationally each month. The prices were for almost identical types of cookies varying only by brand and package size. Therefore, an adequate number of observations were available to calculate an average price for a specific type of cookie in individual cities as well as nationally.

In the revised CPI, collection methodology was changed to allow for almost the full range of goods and services to be sampled.[4] Under this procedure, the selection of each item is keyed to the sales experience of the store in which it is priced. The field representative works from a list of general categories in selecting the item to be priced. This procedure gives each variety, brand, size, and so forth, a chance of selection proportional to its importance in total sales for the general category in the particular store. Once selected, the same item continues to be priced over time. This procedure results in a considerably larger range of

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goods and services being selected for the food item sample.

For calculating the CPI, the revised procedure produces an index which is much more representative of the goods and services purchased by consumers. Fewer prices are obtained, however, for any specific item because data collection is spread over a much broader range of food products. For example, about 570 prices are presently being collected nationally for cookies. These prices are representative of virtually all kinds of cookies available in the marketplace, including packaged cookies, cookies sold loose in bakeries, dietetic cookies, and all of the various combinations of ingredients. Therefore, there are relatively few observations for any one type of cookie, compared to the 1,100 prices that were obtained for a specific type of cookie prior to 1978. Because of the smaller number of quotations obtained for nearly comparable food items, published average prices currently are available only at the national and regional level.

The number of prices available to calculate average prices for any food category in the CPI is dependent upon two factors: 1) the number of price quotations assigned to the product stratum (which assignment is designed for maximum accuracy of the CPI); and 2) the homogeneity of a specific item with respect to ingredient composition, package size, and packaging. Thus, for an item such as white pan bread, which has a large number of price quotations assigned to its stratum and which is a relatively homogeneous product, about 930 prices are obtained nationally, of which about 60 percent are used to calculate the U.S. average price. Generally, for the purpose of average price calculation, very few items have usable sample sizes which approach that for white pan bread.

In developing post-1980 calculation procedures for average food prices, several procedures were considered, including the use of the benchmark and estimation procedure used in the earlier series. It was decided, however, to adopt a methodology in which actual weighted average prices would be calculated each month. In determining the items for which to develop average prices, BLS identifies the narrowest possible specification for which a usable sample can be obtained and an average price calculated. If the specification is judged narrow enough to be useful, an average

price is published. For example, average prices are calculated for freeze-dried instant coffee in jars ranging in size from 6.1 to 14 ounces. The specification was narrowed to this range because the per-ounce price of freeze-dried instant coffee varies widely from small jars (6 ounces or less) to large jars (more than 14 ounces). Therefore, prices for jars outside the 6.1- to 14-ounce size range are excluded to eliminate price extremes which would not yield realistic average prices.

The first step in calculating an average food price is the computation of an "effective price." This procedure involves converting a reported price to a price per standard unit of measure (weight, volume, or count). The published average prices are weighted averages of the individual effective prices. The weight of each observation reflects the relative share of expenditures which the individual observations were selected to represent in the CPI. (See "Consumer Price Index," BLS Handbook of Methods, Volume II, Bulletin 2134-2, for a detailed methodological description.)

Users of average retail food prices should be aware that these data are best suited to measure price levels in a particular month. The estimates are not designed to track price changes over time, nor are they intended for use in making interarea comparisons. Ongoing updates of the item and outlet samples will cause movement of average prices over time to differ from the movement of an index for the same item, because the index reflects only price change for the same product in the same retail outlet. In calculating average prices, individual quotes that meet the item and geographic definitions are included, regardless of whether they are used for index calculation. Differences in prices among geographic areas may not represent true differentials because of variations in brand, quality, and size of the sample. Of course, such differences will vary considerably depending on the item being observed. For an item such as boneless round steak, for which U.S. Department of Agriculture grades are used to define the quality of the cut of meat, comparison of prices among regions is likely to be more informative than for items such as fresh pork sausage, ice cream, canned tomatoes, and smoked ham, for which differences in brand and quality can be quite substantial. ☐

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[1] The four census region, are: Northeast: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; North Central: Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; South: Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; and West: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

[2] Cost of Living and Retail Prices in the United States (1890–1903), Bulletin 54 (U.S. Bureau of Labor, 1904), p. 1129; and Cost of Living and Retail Prices of Food (18th Annual Report of the Commissioner of Labor, 1903), pp. 15–17.

[3] See Doris P. Rothwell, "Calculation of Average Retail Food Prices," Monthly Labor Review, January 1965, pp. 61–66.

[4] The Consumer Price Index: Concepts and Content Over the Years, Report 517 (Bureau of Labor Statistics, 1978), p. 7.