The Impact of Nontraditional Retailers on Retail Dairy Prices and the Dairy CPI

Abstract

Over the past 10 years, the growth of nontraditional retail food outlets has been of the biggest changes in the retail food market landscape. Nontraditional retailers have helped to increase the variety of shopping and food options available to consumers, and also have increased the amount of price variation in retail food markets. The current CPI for food does not fully take into account the lower price option that a nontraditional retailer offers when it enters and expands in a given geographic market. A significant difference exists between price change as measured using scanner data and the CPI estimate of price change, even for the relatively low food inflation period of 1998-2003 covered in this report. The results of this study estimate that the BLS CPI for dairy products overstates food price change by 1 to 3 percentage points per year for the dairy, eggs, and butter and margarine CPI categories.

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Selected Paper prepared for presentation at the American Agricultural Economics Association Annual Meeting, Long Beach, California, July 23-26, 2006

One of the biggest changes in the retail food market landscape over the past 10 years has been the growth of nontraditional retail food outlets. Led by large retail firms, such as Wal-Mart, Costco, and Target, the nontraditional retail food store sells a variety of non-food products in one of several possible store formats. The supercenter, a format that combines a full mass merchandiser with a full-line grocery store, is having the largest impact nationally. These stores, often over 150,000 square feet in size, provide the consumer with the ability to purchase many of the common grocery and food items along with a wide variety of general merchandise, clothing, electronics, and other household goods.

The supercenter, however, is not the only nontraditional format that has experienced a measurable growth rate over the past few years. Dollar stores, which usually sell a limited assortment of discounted products, have also expanded their food offerings with some even introducing refrigerated and frozen sections to their stores in order to expand the variety of products that they can offer to consumers. Finally, warehouse club stores and drug stores have also increased their focus on food items and taken market share from traditional supermarkets.

These nontraditional retailers have helped to increase the variety of shopping and food options available to consumers, and also have increased price variation in retail food markets. Food prices can differ for a variety of reasons based on where you live, your demographic characteristics, and where you shop. Differences in the production costs of retailers including labor costs, operating costs, and wholesale cost of goods sold will impact the prices that retailers charge as will the competitive environment in which they operate. As competition for the U.S. consumer food dollar has accelerated with the increasing growth of nontraditional retail outlets,

traditional retailers have been forced to either decrease prices to remain competitive with the new forms of competition or increase the number of services they provide and the quality of their offerings or some combination of the two.

Identifying and understanding the determinants of retail food price variation helps to explain and predict how changes in the dynamics of retail markets will impact food prices. Retail food price variation has an impact on consumers and food producers. For consumers that are increasingly pressed for time and looking for convenient, yet healthful foods, knowing about differences in food prices can help them make more informed decisions on where to shop and what foods to buy. For food producers, a better understanding of how different factors impact the retail prices of food, will improve their ability to build strong relationships with food retailers and consumers by providing the desired combination of price, quality, and variety to the retail food market.

The number and variety of food items purchased by the average consumer spans across a wide range of raw and processed food products. Although, there are many common features of retail food prices across these food categories, one would be remiss in not taking a closer look at some of the subcategories on an individual basis in order to incorporate both retail industry-wide phenomenon and commodity or sub-category changes into the analysis. This paper focuses on these dynamics and how they impact dairy product price variation. Changes in the retail price of dairy products, such as milk or cheese, are often a concern for both producers and consumers. This study provides evidence of the variation in dairy prices across different store formats.

Previous work on Food Price Variation

A long literature has investigated the possible differences in food prices that exist across different geographic locations and/or consumer demographics. Findings have been mixed, but much of the available evidence indicates that shopping opportunities for the poor are more limited than for higher income consumers and that prices are slightly higher in stores whose patrons are chiefly low-income consumers.

A review of 14 store surveys conducted between 1966 and 1996 indicates that food prices are generally higher in smaller grocery stores than in larger supermarkets and also higher in inner city and rural locations than in suburban locations. Since the poor are more likely to shop in small grocery stores and to live in inner city or rural locations, they often face higher food prices. After controlling for store type and location, however, there is little evidence of a significant relationship between neighborhood income and food prices (Kaufman et al, 1997). What other previous studies fail to focus on is the importance of where one shops as a major determinant of average prices paid. The importance of the format of a food store has grown in significance over the past 10 years as consumers increasingly choose to buy a greater proportion of their food products at nontraditional food stores.

Despite significant consolidation over the past ten years in the supermarket industry, nontraditional retailers continue to grow at a significantly faster rate than supermarket chains. Various studies have demonstrated that food items at nontraditional retailers are 8%-27% lower priced that at the large supermarket chains, even after discounts for loyalty card and other special are taken into account.[1]

The current procedure used by the Bureau of Labor Statistics (BLS) to calculate the CPI for food does not fully take into account the large and continuing expansion of nontraditional food stores.[2] The BLS employs a linking procedure that assumes quality-adjusted prices at nontraditional retailers are exactly equal to prices at conventional supermarkets. Thus, when a supercenter or other nontraditional store replaces a conventional supermarket in the BLS sample of stores from which it collects prices, it links the lower nontraditional price to the higher supermarket price to remove any difference. Even though packaged food items are physically identical at the two stores, the BLS procedure does not recognize any price difference between the stores. The BLS's assumption is inconsistent with actual market outcomes in which nontraditional retailers have expanded very quickly in markets that it entered and offered substantially lower prices for a wide variety of food products. Thus, the market impacts of nontraditional retailers are understated in the CPI for food. Since the CPI for food is used as a basis for inflation in a variety of government and industry measures, it is important to make sure that the CPI is an accurate estimate of retail price change as it relates to the cost or living.

Hausman and Leibtag (2004) address this issue by comparing average prices for 20 food products over a four year period and find that nontraditional retailers charge 27% lower prices, on average, for those food products. Since the BLS does not fully account for these lower prices in its measure of food price inflation, the CPI for food at home is biased upward about by about 0.32 to 0.42 percentage points, which given an average of 2 to 3 percent food price inflation per year, leads to an upward bias in the estimated inflation rate of about 15% per year.

In the next section, the data for this study are described in detail, while section four describes general food expenditure patterns in the data that reflect trends in U.S. food retail markets. Average price calculations for a variety of dairy products are presented in section five, while section six compares price change in the calculated data to BLS measures of price change- the consumer price index (CPI) for the dairy CPI and its components. Section seven focuses on policy implications of these results and concludes with a summary and ideas for future research.

Data

This study uses ACNielsen Fresh Foods Homescan scanner panel data for the years 1998-2003. The Fresh Foods data are from a consumer panel consisting of about 8,000 representative households per year across the U.S. and includes purchase and demographic information for each household in the sample. Fresh Foods Homescan panelists record both their UPC-coded transactions and their random-weight[3] (non-UPC coded) food purchases over the year(s) that they participate in the panel. This sample was used to measure the entire market basket of household purchases of food for at-home consumption[4].

Households are recruited to join the panel based on demographic characteristics to ensure representation for demographic variables such as household income, family composition, education, and household location. Each household is equipped with an electronic home-scanning unit, and household members record every food purchase they make by scanning in the appropriate codes of the food products that they purchase for home consumption. The panel is recruited on a permanent basis, subject to turnover from normal attrition or adjustments to

demographic targets necessitated by Census revisions.[5] The panel is geographically dispersed and is demographically balanced to match the U.S. population as closely as possible. One of the unique features of the Homescan data is that panelists record food purchases across all outlet channels, including grocery, drug, mass, club, supercenter, and convenience stores.

These data are useful in price analysis since we are able to observe actual purchase choices by consumers. However, in terms of food purchase behavior, the key missing information is consumer purchases of food away from home (primarily restaurant meals) so one needs to assume that the unknown of food away from home purchases do not somehow bias the average prices paid by an individual household for their food at home purchases. Once this assumption is made these data are useful for analysis of the impact of store choice on average prices paid for food-at-home items. This measurement of average price paid can be aggregated across households and/or across time to measure price change for different categories of products.

Standard demographic information is collected on an annual basis from each household and each household's home market/city and census region is identified for stratification purposes. Each household is then assigned a projection factor (weight) based on its demographics[6] in order to aggregate the data to be representative at the market, regional, and national level.

The information that is captured on a transaction level basis includes: date of purchase, store name and channel type identifier[7], store department identifier[8], item description, brand name, number of units purchased, price paid, promotions/sales/coupons used (if any). For retail stores

that ACNielsen tracks with their store-level scanner data[9], prices are verified through store-level price and promotion checks.

Warehouse shipment data are used to supplement scanner-generated data collected from households or provided to ACNielsen through their store-level scanner data. Warehouse shipment data are used to estimate the balance of sales moving through other food retailers. This information is from Census data (i.e., non-projected, actual shipment data) supplied to ACNielsen by wholesale co-operators.

Some question the quality of household panel data when they try to reconcile it with store-level scanner data. There is the perception that the volumetric data from each source should be the same. However, panel data and store data are not always equal because measurement methodologies differ. Store-level data records millions of shopping transactions while panel data records a specific group of shoppers. In addition, panel data only represents household-based purchases, so there are no small businesses or other institutional purchases included in the panel. Panel data were used in this report in order to capture the store choice made by households. This variable could not be captured in store-level data that does not include some of the major nontraditional retailers.

Shopping Patterns

Since the Homescan data tracks consumer food purchase behavior, expenditure shares of the consumer food dollar can be calculated for seven broad retail store formats for the years 1998-

2003. The traditional retail group consists of conventional supermarkets, superstores, food-drug combination stores, and convenience stores. As a group, these stores have experienced declining expenditure shares from 1998 to 2003 falling from 82.3% of the market to 69.2% by 2003. Nontraditional outlets, including supercenters, warehouse club stores, mass merchandisers, and dollar stores have grown in popularity and increased their share of consumer expenditures from 17.7% in 1998 to 30.8% by 2003.

Within the nontraditional retail group, supercenters (primarily Wal-Mart Supercenters) have experienced the largest increase over this 6 year period, increasing from just over 3% in 1998 to nearly 11% in 2003. Warehouse Club Stores and Dollar Stores have also experienced significant increases in their share of the consumer food dollar as U.S. consumers look to find the best combination of prices, services, and convenience at their retailer of choice.

For consumers, these changes in the retail food market landscape can have a large impact on the variety of foods available and average prices paid for food. For example, in 2003, Wal-Mart became the top food retailer in the Dallas, Texas market rising from 6th, in terms of market share, in less than six years. In an industry where market leaders are usually long-time participants in a market, a dramatic change over a short period of time has an impact on both the consumers and retail food workers in a market.

How do these changing shopping patterns impact the prices paid by consumers? Hausman and Leibtag (2004) calculate the ratios of average prices across different types of outlets for 20 food categories and compare the prices for the food categories in traditional supermarkets compared

to prices for these same categories in nontraditional stores. They find the largest difference in average price for lettuce; nontraditional store prices were about 50 percent lower than traditional supermarkets over the 48 month period. Bottled water was the lowest price difference with nontraditional store prices about 5 percent less expensive. Soda was the only item with a lower price in traditional supermarkets than in nontraditional stores. Across all of the food categories, nontraditional store prices are 27 percent lower than traditional supermarkets.

In considering these results, one could be concerned that nontraditional stores and supermarkets are selling a different mix of products, e.g. types of apples could differ across store types. This quality and variety difference is difficult to quantify in consumer panel data since households only report what they actually purchased, not what was available to them in a given store. Given this limitation, the analysis below uses more restrictive comparisons in the varieties and types of dairy products compared.

Price Differences

In order to get a better understanding of the price differences across different store formats, average prices are calculated for a wide variety of dairy products that are commonly purchased at both traditional and nontraditional stores. Tables 1 and 2 summarize the general national price trends for dairy products in the U.S. for the years 1998-2003. These annual average price estimates are for 24 fixed weight dairy products and 8 random weight products. The average prices presented in the table are calculated by taking the total weighted expenditures for a given product and dividing by the total weighted quantity (in ounces) that was purchased. These

average prices were then weighted using the projection factors for each household in the sample to arrive at the national average. A similar procedure was used for all subgroup price average calculations.

For the most part, the average prices follow well-known patterns. Less processed products are subject to greater variation in prices from year to year as they are more closely tied to changes in commodity prices at earlier levels of production. For example, butter and egg prices have the greatest annual average variation in prices at 12 and 8 percent per year, while more processed products such as ice cream only vary by 2 percent per year. Another interesting trend in the data is the impact of increased sales of new products on average prices. For example, yogurt shakes and drinks, a relatively new product category with insufficient sample size to even be reported in 1998, had declining average prices for three of the four years in the sample as increased availability of the product drove its average price down 14 percent over this time period. These general price trends show the importance of defining the food categories for comparison, as trends differ across different cheese varieties and even between different types of milk[10] as well as between different package sizes. The analysis in this paper presents results for similar package sizes across all groups and well-defined food products for ease of comparability.

Nontraditional Retailers Drive Price Variation

The growth of nontraditional retailers increases the options available to consumers and is a major determinant of geographical price variation. Given the smaller differences in dairy prices paid across income groups (see Leibtag (2006)), but the larger differences in average prices among

regions and markets, a store's format, including physical characteristics, product offerings, business practices, and marketing strategies, is a likely determinant and a key to understanding retail food price variation.

Using the Homescan data, I calculate average prices paid at traditional versus nontraditional food retailers. Even when controlling for similar-sized packages, dairy prices are 5 to 25 percent lower at nontraditional retailers than at traditional supermarkets. For example, skim and low-fat milk prices are consistently 5-12 percent lower at nontraditional stores. Taking a representative basket of dairy products purchased at traditional and nontraditional retailers, traditional store prices are 9.1 percent above nontraditional store prices. The majority of annual average price comparisons (Tables 3-6) show lower prices for nontraditional retailers. The main exceptions to this rule are in the Muenster cheese, butter, frozen yogurt, and sherbet categories. These products may be more heavily promoted at traditional retailers or they may not yet be sold in large enough quantities at nontraditional retailers to have lower prices at this time. In the random weight cheese product categories, there is more variation and traditional retailers have lower prices for some products, however, at the aggregate level nontraditional stores still have slightly lower prices even for these specialty items.

These price differences are significant, especially when compared with standard measures of food price inflation over time. Over the past 20 years, annual food price changes, as measured by the CPI, have averaged just 3 percent per year. Differences of more than 5 percent in food prices are driven by differences in store formats, which largely account for the regional and market variation in prices observed across the U.S.

Price Change Comparison

Using the average price calculations from these data, one can compare average annual price changes for these dairy products as compared to the implied average annual price change from the CPI for food. Three aggregate CPI indices can be compared to the data in this report- dairy, eggs, and butter and margarine. The overall dairy CPI has four subgroups – milk, cheese, ice cream, and other dairy that also can be compared with the data as shown in Table 7. The overall trend in these comparisons is that average price change as measured by scanner data show lower levels of price change than that reported by BLS. This is consistent with the often-cited criticism by many in the food industry that increase competition from nontraditional retail outlets dampens any inflationary price increases.

In 4 of the 5 years compared in this study, dairy price change is smaller in the scanner data when compared to CPI data. This trend is even more pronounced in the egg category in which all five years show lower price change rates from the scanner data. The exception is in the butter and margarine category in which the scanner data shows smaller price changes in just 2 of the 5 years. Nevertheless, it is interesting to note that the large recorded increase in butter and margarine prices in the 2001 CPI was almost completely unobserved in the scanner data. Overall, these comparisons imply that the BLS CPI values are 1 to 3 percentage points above the scanner data estimates of annual price change. This is a very significant difference considering that annual food-at-home price inflation averaged just 2.2 percent for this time period.

This difference implies that, at least, for these categories, the CPI overstates food price inflation, but the exact magnitude is more difficult to quantify given some of the differences in these data sources. The underlying data used to measure the CPI is store-based price information and does not fully take into account changing consumer shopping behavior in a timely manner. This may cause some price changes to be missed in the CPI calculation. On the other hand, the ACNielsen Homescan data does track consumer shopping behavior and picks up shopping behavior changes as they occur, but may understate food price inflation if consumers in the panel are more price sensitive and/or deal savvy in their shopping behavior than the average U.S. household. A hybrid approach that uses scanner data to track current shopping patterns and quality adjust the current CPI for food may be the best solution to this discrepancy. For a more detailed discussion of these issues, see Hausman and Leibtag (2004, 2005).

Conclusion

Changes in food retailing affect food prices, as well as the variety of products and services available to consumers. With average dairy food prices 5-25 percent lower at nontraditional retailers, the growing presence of these stores will decrease the average prices paid by consumers for these products. While different product mixes may exist at different stores, the price differences estimated in this analysis across different outlet types are unlikely to arise primarily from different product mixes since comparisons are made for similar package sizes and product characteristics. These lower prices and increase options should provide a net welfare benefit to U.S. consumers (Hausman and Leibtag, 2005), but it remains to be seen, however, if the overall economy will benefit from these new retail formats, particularly when taking into account the

impact on traditional retailers, food retail workers, food manufacturers, and agricultural producers.

As consumer's turn in greater numbers to nontraditional stores for their common grocery items, the prices and variety of products available at those stores will have an increasingly important role in retail food markets. A nontraditional store's entry into a new geographic market creates a direct price effect by offering a lower price option to consumers and an indirect price effect by causing traditional supermarkets to lower their prices because of the increased competition.

The current CPI for food does not fully take into account the lower price option that a nontraditional retailer offers when it enters and expands in a given geographic market. Currently, the BLS links out the lower prices of a nontraditional retailer by assuming that any change in prices that exists between a traditional and nontraditional retailer is a store-based quality of service difference as opposed to simply a lower price for similar (or even identical) products. If this assumption were correct, we would not have seen, and continue to see, the rapid gain in market share by nontraditional outlets.

A more appropriate approach to price change estimation would be to track consumer purchase behavior and adjust observed price changes in a given category for this changing shopping pattern. This could be accomplished using an expenditure-weighted measure of price change with frequently updated measures from scanner data sources. A frequently updated expenditure weighted average price calculation could currently be applied to industries in which consumer

purchase information is currently readily available, such as the grocery industry, but could also be applied elsewhere as better tracking information is developed across other sectors.

A significant difference exists between price change as measured using scanner data and the CPI estimate of price change, even for the relatively low food inflation period of 1998-2003 covered in this report. The results of this study estimate that the BLS CPI for dairy products overstates food price change by 1 to 3 percentage points per year for the dairy, eggs, and butter and margarine CPI categories. Future research is necessary to estimate whether these difference are as pronounced in other food categories. The more common this difference is, the more important a correction to the official estimates of price change is to getting an accurate measure of food price inflation.

Traditional food retailers that have lowered prices and/or increased the quality and variety of the services they provide have remained competitive, while those that have not adapted have struggled. Retailers that do not adjust quickly lose market share and are in some cases choose to exit a market where they once were dominant, and in some cases, out of food retailing entirely. For food wholesalers, distributors, and others involved in the food supply chain, expanding and maintaining relationships with nontraditional retailers will be crucial to ensuring that their products are available to the U.S. consumer in the future.

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Schultze C. and C. Mackie, eds.; *At What Price?*, Washington: Nation Academy of Sciences Press, 2002.Table 1: Average U.S. Dairy Prices, 1998-2003

Table 1: Average U.S. Dairy Prices, 1998-2003

Product	1998	1999	2000	2001	2002	2003
American Cheese (Pound)	2.73	2.87	2.82	2.83	2.75	2.67
Butter (Pound)	2.63	2.40	2.19	2.71	2.28	2.12
Cheddar Cheese (Pound)	3.58	3.75	3.44	3.58	3.57	3.62
Colby Cheese (Pound)	3.13	3.28	3.14	3.32	3.26	3.21
Cottage Cheese (Pound)	1.43	1.50	1.51	1.54	1.53	1.50
Cream Cheese (Pound)	2.46	2.60	2.51	2.59	2.54	2.52
Extra Large Eggs (Dozen)	1.10	1.00	0.99	1.02	1.03	1.22
Farmers Cheese (Pound)	4.10	3.94	4.16	3.92	3.97	4.84
Frozen Yogurt (Half-Gallon)	3.26	3.68	3.37	3.63	3.80	3.52
Ice Cream (Half-Gallon)	3.07	3.17	3.18	3.34	3.31	3.26
Jumbo Eggs (Dozen)	1.21	1.08	1.10	1.14	1.12	1.34
Large Eggs (Dozen)	1.01	0.92	0.94	0.96	0.98	1.16
Low-fat milk (Gallon)	2.32	2.48	2.42	2.50	2.35	2.37
Margarine (Pound)	0.83	0.83	0.83	0.84	0.78	0.81
Medium Eggs (Dozen)	0.76	0.69	0.72	0.77	0.71	0.93
Mozzarella Cheese (Pound)	3.19	3.26	3.29	3.34	3.49	3.46
Muesnter Cheese (Pound)	3.63	3.83	3.60	4.03	4.74	4.82
Ricotta Cheese (Pound)	1.64	1.70	1.72	1.76	1.78	1.76
Sherbert (Half-Gallon)	2.65	2.78	2.79	2.84	2.93	2.91
Skim milk (Gallon)	2.25	2.40	2.37	2.38	2.27	2.25
Swiss Cheese (Pound)	4.28	4.13	4.22	4.25	4.48	4.31
Whole milk (Gallon)	2.53	2.67	2.61	2.72	2.56	2.60
Yogurt (6 ounces)	0.46	0.47	0.48	0.49	0.51	0.49
Yogurt Shakes (16 ounces)	NA	2.26	2.20	2.15	2.18	1.94

Source: ERS calculations using ACNielsen Homescan Data

Table 2: Average Random Weight Cheese Prices, 1998-2003

Product (Random Weight)	1998	1999	2000	2001	2002	2003
American Cheese (Pound)	2.82	3.61	3.45	3.72	3.81	3.83
Cheddar Cheese (Pound)	3.89	3.32	3.35	3.50	3.64	3.60
Colby Cheese (Pound)	3.24	3.25	3.11	3.47	3.40	3.26
Cream Cheese (Pound)	2.49	3.59	3.34	3.72	3.15	3.72
Mozzarella Cheese (Pound)	3.02	3.27	3.30	3.67	3.74	3.87
Muesnter Cheese (Pound)	2.14	3.91	3.76	3.84	3.77	3.75
Ricotta Cheese (Pound)	NA	NA	2.78	2.89	2.40	2.88
Swiss Cheese (Pound)	4.73	4.55	4.42	4.63	4.71	4.70

Source: ERS calculations using ACNielsen Homescan Data

Table 3: Average Milk Price per Gallon by Store Type, 1998-2003

Milk Type	1998	1999	2000	2001	2002	2003
Skim Milk						
Grocery Stores	2.27	2.41	2.39	2.42	2.30	2.32
Drug and Convenience Stores	2.38	2.55	2.45	2.54	2.40	2.33
Nontraditional Retailers	1.99	2.29	2.27	2.20	2.17	2.07
Lowfat Milk						
Grocery Stores	2.34	2.51	2.45	2.54	2.38	2.41
Drug and Convenience Stores	2.35	2.49	2.58	2.54	2.45	2.36
Nontraditional Retailers	2.18	2.34	2.24	2.33	2.25	2.28
Whole Milk						
Grocery Stores	2.55	2.67	2.60	2.73	2.57	2.63
Drug and Convenience Stores	2.66	2.73	2.75	2.82	2.76	2.55
Nontraditional Retailers	2.45	2.58	2.59	2.71	2.52	2.53

Source: ERS calculations using ACNielsen Homescan Data

Table 4: Average Egg Prices per Dozen by Store Type, 1998-2003

Egg Type	1998	1999	2000	2001	2002	2003
Medium						
Grocery Stores	0.77	0.70	0.74	0.80	0.73	0.94
Drug and Convenience Stores	0.75	0.82	0.88	0.86	0.61	1.05
Nontraditional Retailers	0.67	0.58	0.63	0.62	0.61	0.87
Large						
Grocery Stores	1.01	0.93	0.94	0.97	0.99	1.18
Drug and Convenience Stores	1.04	0.94	0.92	1.05	1.02	1.02
Nontraditional Retailers	0.85	0.72	0.80	0.82	0.82	1.07
Extra Large						
Grocery Stores	1.12	1.03	1.03	1.07	1.08	1.29
Drug and Convenience Stores	1.11	1.10	1.07	1.11	0.97	1.10
Nontraditional Retailers	0.90	0.79	0.79	0.82	0.86	1.11
Jumbo						
Grocery Stores	1.22	1.11	1.14	1.21	1.19	1.41
Drug and Convenience Stores	1.40	1.28	0.89	1.21	1.12	1.21
Nontraditional Retailers	1.00	0.85	0.89	0.89	0.90	1.11

Source: ERS calculations using ACNielsen Homescan Data

Table 5: Average Dairy Prices by Store Type, 1998-2003

Product	1998	1999	2000	2001	2002	2003
American Cheese (Pound)						
Grocery Stores	2.75	2.89	2.86	2.88	2.80	2.74
Drug and Convenience Stores	2.82	3.70	3.43	3.12	2.90	2.35
Nontraditional Retailers	2.55	2.59	2.45	2.57	2.55	2.43
Butter (Pound)						
Grocery Stores	2.63	2.37	2.16	2.79	2.28	2.14
Drug and Convenience Stores	2.61	2.35	2.30	2.04	2.52	2.39
Nontraditional Retailers	2.63	2.61	2.39	2.41	2.32	2.09
Cheddar Cheese (Pound)						
Grocery Stores	3.59	3.76	3.52	3.61	3.60	3.65
Drug and Convenience Stores	4.46	5.77	5.57	4.43	3.85	4.32
Nontraditional Retailers	3.45	3.45	2.76	3.49	3.40	3.39
Colby Cheese (Pound)						
Grocery Stores	3.23	3.39	3.25	3.44	3.30	3.29
Drug and Convenience Stores	4.17	3.70	3.25	3.38	4.26	4.39
Nontraditional Retailers	2.68	2.77	2.61	2.84	3.06	3.01
Cottage Cheese (Pound)						
Grocery Stores	1.43	1.52	1.52	1.56	1.56	1.52
Drug and Convenience Stores	1.57	1.66	1.71	1.93	1.78	1.65
Nontraditional Retailers	1.28	1.29	1.28	1.39	1.35	1.37
Cream Cheese (Pound)						
Grocery Stores	2.48	2.64	2.54	2.64	2.57	2.58
Drug and Convenience Stores	2.67	2.45	2.61	2.17	2.23	1.88
Nontraditional Retailers	2.17	2.14	2.16	2.30	2.28	2.26
Farmers Cheese (Pound)						
Grocery Stores	4.22	4.38	4.24	3.96	4.12	4.83
Drug and Convenience Stores	NA	NA	NA	NA	NA	NA
Nontraditional Retailers	2.97	2.84	3.20	3.19	3.17	5.44
Frozen Yogurt (Half-Gallon)						
Grocery Stores	3.22	3.68	3.36	3.61	3.79	3.48
Drug and Convenience Stores	6.82	5.31	5.45	5.79	5.66	8.30
Nontraditional Retailers	4.38	3.68	3.37	4.28	3.61	4.00
Ice Cream (Half-Gallon)						
Grocery Stores	3.05	3.16	3.17	3.33	3.30	3.22
Drug and Convenience Stores	3.73	3.75	3.55	3.79	3.84	4.18
Nontraditional Retailers	3.05	2.93	2.98	3.20	3.15	3.19
Margarine (Pound)						
Grocery Stores	0.84	0.84	0.84	0.86	0.81	0.84
Drug and Convenience Stores	0.91	0.89	0.83	0.75	0.80	0.68
Nontraditional Retailers	0.68	0.70	0.71	0.68	0.65	0.66
Mozzarella Cheese (Pound)						
Grocery Stores	3.21	3.28	3.32	3.39	3.55	3.53
Drug and Convenience Stores	3.43	3.79	3.89	3.50	4.07	2.90

Nontraditional Retailers	3.11	3.25	3.16	3.07	3.23	3.14
Muesnter Cheese (Pound)						
Grocery Stores	3.57	3.85	3.58	4.06	4.75	4.86
Drug and Convenience Stores	NA	NA	2.50	3.58	NA	NA
Nontraditional Retailers	4.26	4.61	4.04	3.78	4.68	4.71
Ricotta Cheese (Pound)						
Grocery Stores	1.66	1.71	1.74	1.80	1.83	1.82
Drug and Convenience Stores	2.20	2.13	2.11	2.35	1.54	2.32
Nontraditional Retailers	1.32	1.38	1.59	1.35	1.43	1.40
Sherbert (Half-Gallon)						
Grocery Stores	2.65	2.77	2.78	2.81	2.90	2.88
Drug and Convenience Stores	2.88	2.62	3.03	3.43	2.63	3.06
Nontraditional Retailers	2.43	2.88	2.82	3.06	3.19	3.03
Swiss Cheese (Pound)						
Grocery Stores	4.45	4.49	4.42	4.60	4.86	4.71
Drug and Convenience Stores	5.80	5.68	7.98	4.24	7.61	5.23
Nontraditional Retailers	3.63	3.58	3.90	3.70	3.82	3.77
Yogurt (6 ounces)						
Grocery Stores	0.47	0.47	0.49	0.50	0.52	0.51
Drug and Convenience Stores	0.47	0.61	0.60	0.57	0.59	0.47
Nontraditional Retailers	0.41	0.40	0.38	0.41	0.44	0.44
Yogurt Shakes (16 ounces)						
Grocery Stores	NA	2.26	2.25	2.24	2.23	1.98
Drug and Convenience Stores	NA	NA	1.94	2.41	2.02	2.41
Nontraditional Retailers	NA	NA	2.04	1.93	2.07	1.90

Source: ERS calculations using ACNielsen Homescan Data

Table 6: Average Prices for Random Weight Cheeses per Pound by Store Type, 1998-2003

American Cheese (Pound)	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**
Grocery Stores	2.79	3.66	3.50	3.77	3.85	3.93
Drug and Convenience Stores	2.30	2.86	3.18	3.31	2.85	3.14
Nontraditional Retailers	NA	3.29	3.21	3.30	2.97	3.19
Cheddar Cheese (Pound)						
Grocery Stores	3.86	3.30	3.36	3.47	3.65	3.54
Drug and Convenience Stores	1.73	3.52	3.04	4.43	3.55	4.00
Nontraditional Retailers	NA	3.60	3.34	3.65	3.55	3.57
Colby Cheese (Pound)						
Grocery Stores	3.12	3.27	3.14	3.49	3.43	3.29
Drug and Convenience Stores	5.15	2.97	3.02	2.89	4.05	2.87
Nontraditional Retailers	NA	3.21	2.76	3.38	3.03	3.05
Cream Cheese (Pound)						
Grocery Stores	1.87	3.06	3.12	3.50	2.81	3.54
Drug and Convenience Stores	4.04	1.74	3.99	NA	3.49	NA
Nontraditional Retailers	NA	3.38	1.85	1.65	2.91	3.41
Mozzarella Cheese (Pound)						
Grocery Stores	2.93	3.31	3.41	3.72	3.85	3.96
Drug and Convenience Stores	2.85	4.31	4.09	2.05	4.02	4.80
Nontraditional Retailers	NA	2.64	2.72	3.24	2.88	2.82
Muesnter Cheese (Pound)						
Grocery Stores	2.10	4.13	3.85	3.95	3.83	3.88
Drug and Convenience Stores	1.19	4.08	4.56	4.23	3.09	1.36
Nontraditional Retailers	NA	3.41	3.07	3.42	3.42	3.19
Ricotta Cheese (Pound)						
Grocery Stores	NA	1.43	2.39	3.02	2.43	2.92
Drug and Convenience Stores	NA	NA	NA	NA	NA	NA
Nontraditional Retailers	NA	NA	4.57	6.73	NA	3.29
Swiss Cheese (Pound)						
Grocery Stores	4.67	4.63	4.49	4.71	4.84	4.79
Drug and Convenience Stores	4.05	3.93	3.25	4.23	4.51	4.30
Nontraditional Retailers	NA	4.30	3.76	3.98	3.65	4.23

Source: ERS calculations using ACNielsen Homescan Data

Table 7: Average Annual Percent Change in Prices, ACNielsen Homescan vs. BLS, 1999-2003

	1999	2000	2001	2002	2003
ACN Dairy Total	6.0	-1.6	3.5	-1.2	-0.1
BLS Dairy Total	5.8	0.7	4.0	0.6	-0.1
ACN Milk	2.3	-0.8	1.0	-1.9	0.2
BLS Milk	6.2	0.2	4.5	-1.9	0.8
ACN Cheese	3.0	-0.8	1.9	0.3	0.3
BLS Cheese	6.8	0.1	2.9	1.4	-0.4
ACN Other Dairy	0.0	0.1	0.0	0.2	-0.3
BLS Other Dairy	5.2	2.1	2.8	1.8	0.4
ACN Ice Cream	0.6	-0.2	0.5	0.0	-0.3
BLS Ice Cream	4.0	1.7	5.5	3.3	-2.0
ACN Eggs	-0.4	0.1	0.2	0.0	1.1
BLS Eggs	-5.4	3.0	3.4	1.3	13.8
ACN Butter and Margarine	-0.3	-0.3	1.0	-0.7	-0.2
BLS Butter and Margarine	-0.1	-3.1	14.9	-2.6	-1.2

Source: ERS calculations using ACNielsen Homescan Data, BLS-CPI data.

Footnotes

[1] A December 2003 study by UBS Investment Research found a price gap of 17.3% to 26.2%, "Price Gap Tightens, Competition Looks Hot Hot Hot." The previous year UBS found a price gap of 20.8% to 39.1%. For example for a specified identical market basket UBS finds Wal-Mart supercenters to have an average price 19.1% less expensive in Tampa and 22.8% less expensive in Las Vegas. In 2002, Salomon Smith Barney estimated the price gap to be between 5% and 25%. See L. Cartwright, "Empty Baskets, September 12, 2002.

[2] When customers shift from conventional supermarkets to nontraditional retailers no change occurs in the food CPI. To the extent that prices at these outlets decrease (or increase) at a different rate than conventional stores, the food CPI will take account of this change with a lagged effect over time.

[3] If only UPC-coded products were used to measure food-at-home expenditures, many food purchases would not be recorded in the data and food-at-home expenditure shares by store type would not accurately measure true household and market expenditure shares. This is especially true in this situation when nontraditional stores sell fewer random weight items than traditional retailers. Leaving out random weight items would then tend to overstate the shares of food expenditures of nontraditional retail outlets.

[4] In total, there were over 17,000 unique households in the data with some subset participating each year creating a total of 48,005 household-by-year observations. In 1998 there were 7,624 households, 7,124 households in 1999, 7,523 households in 2000, 8,216 households in 2001, 8,685 in 2002, and 8,833 in 2003. Some households participated in the panel for more than one year with 35% participating in only one year, 19% participating for two years, 14% for three years, 10% for four years, 9% for five years, and 13% for all six years.

[5] Households lost through attrition are replaced with others having similar key characteristics.

[6] Age, gender, education, occupation, of head(s) of household, number of household members, household income, household composition, race, and ethnicity.

[7] Grocery, Drug, Mass Merchandiser, Supercenter, Club, Convenience, Other (including dollar stores, bakeries, military stores, online purchases, health food stores, and vending machines)

[8] Dry Grocery, Dairy, Frozen-Produce-Meat, Random Weight.

[9] The ACNielsen store-level sample is updated through both replacement of canceled or closed stores and *Continuous Sample Improvement Program* -- when the sample is changed intentionally to ensure that changes in the universe are reflected in the sample.

[10] The skim milk category includes all gallon containers of milk purchased with a UPC description that includes some fat-free, no-fat, or skim label. The low fat milk category includes all gallon containers of milk purchased with a UPC description that includes low fat, ½%, 1%, or 2%. The whole milk category includes all gallon containers of milk with a UPC description that includes 'whole' in the description.